Reflexive Sensemaking and Sensegiving: An Exploratory Study of Human Resources Analytics Practitioners

REFLEXIVE SENSEMAKING AND SENSEGIVING: AN EXPLORATORY STUDY OF HUMAN RESOURCES ANALYTICS PRACTITIONERS

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Abstract

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While the literature identifies the integral role of human resources analytics practitioners and their capabilities as the defining criteria in extracting the true value of human resources analytics, limited attention has been paid to exploring how the role is executed in practice, nor is much understood from a required capabilities perspective. Accordingly, this research seeks to explore the emerging role of human resource analytics practitioners through the theoretical lens of sensemaking and sensegiving. The study adopts a qualitative research design to collect data from 30 human resources analytics practitioners in the United Arab Emirates through the extended semi-structured narrative of practice interviews and document analysis. The study develops a repertoire of sensemaking and sensegiving practices and their underlying activities to explain how practitioners, while drawing on contextual knowledge, reflexively enact cognitive-discursive and material practices of 'pursuing coherence', 'setting up and delivering conversations', ‘sensible enactment through material support’ and ‘navigating paradoxes’. It shows how practitioners knowledgeably enact these four sets of practices and their underlying activities through 'performing reflexive conversations, underpinning their sensemaking and sensegiving as they perform their analytical work. The research offers insight into how ‘reflexive sensemaking and sensegiving are enacted to support each other through the interplay between cognitive-discursive and material practices. From a practical perspective, the study provides practical insights into how practitioners' capabilities can be built to operate skillfully in their boundary-spanning role through five interlinked situated cognitive-discursive practices with material support.

Dedications

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List of Abbreviations

BD	Big Data
CFO	Chief Financial Officer
CPO	Chief People Officer
ERP	Enterprise Resource Planning
GM	General Manager
HR	Human Resources
HRA	Human Resources Analytics
HRAP	Human Resources Analytics Practitioner
HRBP	Human Resources Business Partner
HRD	Human Resources Director
HRIS	Human Resources Information System
HRM	Human Resources Management
OLS	Ordinary Least Squares
SSF	Sensemaking and Sensegiving Framework
TTAs	Tools, Technologies and Artefacts
UAE	United Arab Emirates
VT	Visualisation Tool

Chapter 1 Introduction

1.1 Introduction

As technology influence at work continues to increase, more data will be collected that organisations will use to drive business and employee performance (Marler and Boudreau 2017; Cascio et al. 2019). As a result, data's growing potential to offer value creation through organisational insights has led to the realisation that data analytics is a critical strategic capability to drive data-led decision-making in managing and developing people (Welbourne 2015; Simon 2017; Van den Heuvel and Bondarouk 2017; Tursunbayeva et al. 2018). Besides this, there are other dynamics both inside and outside the organisation driving the need for data-driven practices within Human Resources (HR), such as the globalisation of the workforce and increased competition for talent, the skills gap within and outside the organisation (Isson and Harriott 2016), continuous pressure for increased effectiveness and productivity (Mayo 2018), and complexity attached to human behaviours and their predictability (Gandomi and Haider 2015).

Researchers argue that the HR analytics practitioner (HRAP) role plays a significant part in helping organisations drive their HR agenda through data-based analytics and insights (Jörden et al. 2021; McCartney et al. 2021). HRAPs can potentially bring much-argued objectivity to organisational decision-making by replacing or supporting the prevailing intuition and gut feeling in HR practice (Pfeffer and Sutton 2006; Rasmussen and Ulrich 2015). HRAPs can strengthen the position of the HR function by helping organisations to drive their success by optimising employee contribution through translating data's overwhelming quantity into accessible quality via the reflexive use of interpretive practices and routines (Calvard 2016) and allowing HR to catch up with its more analytically oriented functional rivals (CIPD 2017; Cascio et al. 2019). While doing so, the HRAP role can impact business outcomes (Van den Heuvel and Bondarouk 2017) and facilitate the execution of business and HR strategies (Levenson and Fink 2017; Minbaeva 2017; Levenson 2018).

However, in the face of such potential opportunities and benefits from adopting HR analytics (HRA), many researchers have argued that HRAPs have generally struggled with interpreting the data to their strategic advantage (Jörden et al. 2021; McCartney et al. 2021). As a result, deployed analytics processes often do not go beyond tactical value to gain insights on people-related issues in the business (Rasmussen and Ulrich 2015; Marler and Boudreau 2017; Schiemann et al. 2018). A key challenge is the lack of understanding of the HRAP's role and required abilities to make sense of the data as reflected in the extant literature (Angrave et al. 2016; Marler and Boudreau 2017; Kryscynski et al. 2018; Minbaeva 2018; Edwards and Edwards 2019). Therefore, further insight into the role of HRAP is required to understand better how it is executed in practice.

1.2 Research Background

In this new era of information management, organisations are presented with widespread opportunities in the form of enormous amounts of raw data that can be accessed and processed to generate insights for informed decision-making (Calvard 2016; Simon 2017; McIver et al. 2018). The value creation of leading companies like Google, Facebook and Amazon thrive on effectively and efficiently making sense of data and using it to their strategic advantage. Similarly, many other consulting companies like Deloitte, Mercer and IBM offer analytical solutions to organisations to help them drive their business outcomes through data (Calvard 2016). While continuing this pattern, organisations aim to exploit the data-rich environment to their strategic advantage by using data analytics systems and capabilities to effectively support their decision-making (McAfee and Brynjolfsson 2012; Huselid 2018).

Consequently, like other functions such as sales and marketing, finance and supply chain, researchers view HRA as presenting strategic opportunities through data analytics processes of varying degrees of sophistication (Davenport et al. 2010; Levenson 2011; Boudreau and Cascio 2017; Simon 2017; Huselid 2018). There are some examples of analytical approaches/practices in HR, such as HR utility analysis (Cascio et al. 2019), HR scorecards (Becker et al. 2001) and HR metrics (Lawler et al. 2004). In addition, there are a variety of ways in which the process of analytics in HR is generally referred to, e.g., terms such as "HR Analytics, Workforce Analytics, Talent Analytics and People Analytics" (Marler and Boudreau 2017: 6). All these terms describe the application of analytics practices to HR data in conjunction with business data by making data about employee characteristics, behaviour and performance easy to access, interpret and take action on (Rasmussen and Ulrich 2015; Pape 2016; McIver et al. 2018; Schiemann et al. 2018) (McIver et al. 2018). HRA can bring increased rigour and objectivity to business decisions through data-based analytics and insights, complimenting and balancing the prevailing intuition and gut feel in HR practice (Pfeffer and Sutton 2006; Rasmussen and Ulrich 2015). Therefore, owing to the perceived benefits of utilising data-driven approaches in HR, organisations are keen to invest in HRA as their strategic capability.

However, the investment into these HRA systems and practices alone does not necessarily yield the desired first-hand benefits to the organisations. The potential value of these systems and initiatives is only as great as the people driving them and translating data's overwhelming quantity into quality insights to help convert raw data into knowledge creation and drive action (Calvard 2016). Therefore, HRAPs are an essential piece in this HR analytics puzzle, which has led to the realisation of the importance of their role in accessing, analysing, interpreting and communicating through data (Marler and Boudreau 2017; Simón and Ferreiro 2018). Therefore, researching an emerging role recognised for its potential contribution to the organisational ability to respond to its challenges in the HR and business domain is a rational and viable research choice. More specifically, it is vital to examine how analytical practitioners understand, interpret and make sense of data themselves and give sense to others when executing their role.

1.2.1 Human Resources Analytics Practitioner Role and its Manifestation

The digital transformation in HR has resulted in the continuous influx of a large amount of data, presenting organisations with widespread interpretative challenges. The potential value of data can only be realised in all business domains, including human resources, by converting an overwhelming quantity into comprehensible quality via imaginative construction of meanings that allow understanding of what is going on in order to work out how to respond now and in the future (Kitchin 2014; Calvard 2016). In this regard, HRAPs are responsible for transforming data into valuable insights (Minbaeva 2017; Van den Heuvel and Bondarouk 2017; McCartney et al. 2021) to help potential constituencies in making decisions related to a broad range of issues in the business (CIPD 2018).

The role of HRAP revolves around finding answers in the data and its relevant context for the human side of the business (Cascio and Boudreau 2016; Simón and Ferreiro 2018), driven by having correct data and making sound interpretations (Boudreau and Ramstad 2005; Fitz-enz and Mattox 2014) as well as persuasive articulation to the decision-makers (Calvard 2016). This role may enable management to assess what they say and be more conscious of their thoughts (Colville et al. 2012). On the other hand, many researchers have argued that analysts have struggled with interpreting the data; as a result, often deployed analytics processes do not go beyond tactical value to gain insights on people-related issues in the business (Rasmussen and Ulrich 2015; Marler and Boudreau 2017; Schiemann et al. 2018) owing to the interpretative challenges associated with the data and the context (Calvard 2016).

More specifically, the role of HRAP requires open ways of establishing what data to look at in a given context, how to interpret it, learn from it for future interpretation (Calvard 2016), and when and how to let go past mental frameworks for interpretative purposes (Colville et al. 2016). Although some analytics efforts may fail, the iterative nature of the analytical process provides reflexive opportunities where there are a variety of possibilities for interpretations and actions to reduce equivocality (Weick and Westley 1996). The HRAPs are expected to manage the role's complexity through reflexive interpretative routines and communication practices within a dynamically complex context (Calvard 2016; Guiette and Vandenbempt 2016). The iterative nature of analytical processes also provides HRAPs with various possibilities for interpretations and actions to reduce equivocality (Weick and Westley 1996).

1.3 Research Problem and Rationale

Despite the strategic importance of the HRAP role and its perceived benefits and associated challenges, research has rarely examined this broadly recognised yet relatively unexplored area of what analysts do when they act strategically (Dulebohn and Johnson 2013; Levenson and Fink 2017). A review of the extant literature indicates that most of the literature surrounding the HRAP role is promotional and commercialised; it provides little empirical evidence about how HRAPs perform their role (Isson and Harriott 2016; King 2016). While on the one hand, consultancy firms, software companies and professional bodies (e.g., CIPD) have drawn attention towards the potential benefits of HRA and the importance of HRAPs in realising these benefits, on the other hand, there is limited empirical research which has explored how HRAPs execute their role (King 2016; Levenson and Fink 2017; Jörden et al. 2021).

The literature has primarily focused on identifying competencies both in technical and non-technical domains (Rasmussen and Ulrich 2015; Andersen 2017; Green 2017; Jorrit van der and Rasmussen 2017; Cascio et al. 2019; McCartney et al. 2021). It falls short of offering empirical insights into how these competencies and behaviours are performed in practice. The extant literature acknowledges (though loosely) the HRAPs' soft skills requirements, such as engaging with key stakeholders and decision-makers to understand the organisational issues and their associated context (Rasmussen and Ulrich 2015). It does not, however, help to understand how HRAPs deploy the required abilities to engage others in their projects. Research has primarily viewed the HRAP's role in a socially decontextualised manner, working with analytical technologies and statistical tools.

Furthermore, while the business analytics practitioner's role has garnered more attention across well-established analytical functions, such as sales, marketing and the supply chain, it has been more problematic for HR owing to multiple challenges. On the one hand, many of these challenges are attributed mainly to scepticism and inconsistency amongst researchers when they see quantitative data as less and of disputed value in managing and developing people (Purcell 2014; Harley 2015; Kaufman 2015). The cynicism leads to a managerial preference for intuition and gut feeling over metrics and quantified data (Greasley and Thomas 2020). As a result, the potential contribution of the role is not well perceived. On the other hand, HRAPs are often blamed for not going beyond the tactical value of their deployed analytics (Rasmussen and Ulrich 2015; Marler and Boudreau 2017; Schiemann et al. 2018). One barrier to improving the quality and outcome of analytics practice is the HRAP's capability to conduct HRA effectively (CIPD 2017; Kryscynski et al. 2018). This lack of insight into how practitioners execute their roles amid complexity and capability challenges presents various research opportunities.

The present study argues that it is human logic and actions that connect different elements in the analytical process, such as connecting the data to the context, putting appropriate data measures in place, managing stakeholders' expectations, processing the data and communicating the results (Marler and Boudreau 2017; McIver et al. 2018). Analysts must connect different elements of the analytical process through the correct logic and sense to get the desired output for the targeted audience (Isson and Harriott 2016; Cascio et al. 2019). Besides this, it is critical to go beyond interpreting the data insights and their implications and tell a story/narrative that can connect with the audience and guide them towards informed decision-making in a given business context (Welbourne 2015). The emphasis is understanding through data about a situation or event by ruling out the number of probabilities (Colville et al. 2013) and crafting persuasive accounts to communicate and give sense to stakeholders (Calvard 2016). Therefore, while acknowledging that tools, technologies and artefacts (TTAs) are essential in analysing HR data, this thesis adopts a human-centric perspective in exploring the role of HRAP. Thus, exploring the human aspects in a socially contextualised manner as part of the HRAP role remains a key focus of this study.

From the human-centric perspective, this study argues that theoretical anchors of sensemaking (Weick 1995; Weick et al. 2005) and sensegiving (Gioia and Chittipeddi 1991) are suited to capture this highly exploratory and explanatory experiences that HRAP go through when confronted with various possibilities for interpretations in a given context (Kitchin 2014; Calvard 2016). In the organisational context, sensemaking has been used to study the constituents and outcomes of organisational actors' meaning-making endeavours to comprehend what is going on and how to respond to it (Maitlis and Christianson 2014; Brown et al. 2015; Sandberg and Tsoukas 2015; Introna 2019; Sandberg and Tsoukas 2020). Sensemaking is a process that allows organisational actors to understand, interpret and make sense of themselves and situations or events. In contrast, sensegiving is about organisation actors' attempts to influence the outcome of others' sensemaking and gain support as and when required (Weick et al. 2005; Maitlis and Lawrence 2007; Cornelissen et al. 2012). While studying the HRAP role, the focus on sensegiving is appropriate because one of the main activities of data analysts is to facilitate the sensemaking of their relevant constituencies.

Their widespread application across various organisational domains and disciplines supports the justification for using sensemaking and sensegiving as theoretical lenses. It allows the researcher to dissect the actor's constituents of making and giving sense in the organisational context (Maitlis and Christianson 2014; Sandberg and Tsoukas 2015). Interestingly, despite extensive application in other organisational contexts, the application of sensemaking and sensegiving within the analytical context in general and the HRAP role, in particular, is minimal. Few studies have investigated the interpretative perspective within this scarce empirical research domain when studying the analyst role (Pirolli and Card 2005; Klein et al. 2007; Grolemund and Wickham 2014). Accordingly, the theoretical anchors for this research, sensemaking and sensegiving, provide further impetus to study HRAP's emerging and promising role.

1.3.1 Research Aims

As such, this research study aims to explore how HRAPs make and give sense when executing their role. In doing so, an understanding of the nature and dynamics of HRAPs' sensemaking and sensegiving practices and their underlying activities can be developed, which may have implications for the successful execution of the role through a proposed practices framework. Such an examination is essential for both practical and theoretical reasons. Theoretically, answering calls from Maitlis and Christianson (2014) and (Sandberg and Tsoukas 2015) provides an opportunity to extend the application of sensemaking and sensegiving in an analytical context (Calvard 2016). At the same time, this study aims to reveal the individual and interactive dynamics of sensemaking and sensegiving practices when executing analytical activities. From a practical perspective, as highlighted earlier, owing to HRA's increased relevance and importance, it is critical to understand how HRAPs execute their role and can potentially expand their repertoire of analytical practices in a dynamic and challenging context.

Therefore, the research seeks to contribute to HRAP, sensemaking and sensegiving research by answering the following research question:

How are the sensemaking and sensegiving practices required as part of their role put into action by human resources analytics practitioners?

The above overarching question is broken down into two sub-questions to help further explore the sensemaking and sensegiving practices in a focused manner.

1. Through which cognitive and discursive activities are these sensemaking and sensegiving practices enacted by human resources analytics practitioners?

2. How are tools, technologies and artefacts engaged to support the cognitive and discursive practices when making and giving sense?

1.3.2 Research Objectives

The following objectives are carved out and then subsequently met as part of the research journey to help answer the above research questions:

Objective 1: To propose a conceptual framework based on a literature review that will facilitate exploring HRAPs' sensemaking and sensegiving practices while executing their roles.

Objective 2: To put into practice a suitable research methodology which will assist in answering the research questions.

Objective 3: To develop a framework of practices underpinned by the activities and knowledge that allows an understanding of the nature and dynamics of sensemaking and sensegiving practices, which may have implications for successfully executing the HRAP's role.

Objective 4: To offer theoretical and practical implications and explore the direction for future research as an outcome of this research.

1.4 Introducing the Research Methodology

This thesis adopts an interpretative philosophical stance to generate situated and contextualised knowledge. There are several reasons why the interpretative approach was considered most appropriate for this study. Firstly, the use of an interpretative approach is well established when studying sensemaking and sensegiving across multiple contexts (Maitlis and Christianson 2014; Sandberg and Tsoukas 2015). Secondly, the interpretative approach allowed the flexible and holistic approach to probe HRAPs' numerous insights and situation-specific meanings (Cunliffe 2011; Schwartz-Shea and Yanow 2012). Thirdly, the interpretative perspective brought to the forefront the way HRAPs make and give sense and how their sensemaking and sensegiving practices interact when executing their role (Stark et al. 2008; Cunliffe 2011).

Methodologically, the thesis deploys a qualitative research design to collect data in a cross-sectional time horizon. The data sources are extended semi-structured narratives of practice interviews in the United Arab Emirates (UAE) and document analysis. The study adopted a two-phase interview process. First phase semi-structured interviews were instrumental in creating openings for an HRAP narrative of practice to unfold while also including questions informed by sensemaking and sensegiving theory. In the second phase, follow-up interviews/conversations were based on details of the sensemaking and sensegiving practices provided in the first phase. The phased interview process allowed for the participant's engagement with interview segments through show and tell experience, each progressively more structured. Purposeful snowball sampling was preferred over other techniques to gather data from thirty informed participants. The emerging themes from emperical data were analysed using a thematic data analysis approach for theorising across multiple data sources. The data analysis revealed the 'what', 'why' and 'how' aspects of underlying activities that HRAPs executed as part of their sensemaking and sensegiving practices. Various practical steps were taken to maintain the study's trustworthiness while adhering to the Bradford University ethical guidelines.

1.5 Key Findings

This thesis is based on empirical narratives derived from extended semi-structured narratives of practice interviews (story of practice). These findings have offered insights into how HRAPs carry out their strategic tasks and contribute to analytics practice. The study adds to the existing research on HRAP sensemaking and sensegiving by investigating their cognitive, discursive and material practices and how they appear and via which behaviours. This study's findings led to the development of a repertoire of practices demonstrating that five sets of practices are crucial to HRAPs situated sensemaking and sensegiving as they perform their strategic tasks while drawing on contextual knowledge of the organisational setting.

The repertoire explicitly places HRAPs' reflexivity at the core of their sensemaking and sensegiving and highlights how they aim to catch reality in-flight (Pettigrew 1990), as it is experienced while on the move (Colville et al. 2016). This process of making and giving sense while on the go involves being more aware of how to construct meaning by questioning ways of making sense (Cunliffe 2002; Cunliffe and Easterby-Smith 2004; Guiette and Vandenbempt 2016). Performing reflexive conversations can increase sensemaking and sensegiving capabilities by bridging the thinking-doing gap and providing means to reconstruct sensemaking and sensegiving. HRAPs sensemaking and sensegiving become an iterative process of experiencing, thinking and acting by questioning, shaping and reshaping senses and sensibilities (Pye 1994). These reflexive practices allow HRAPs to broaden their horizons, revise their presumptions, and raise questions, which is fundamental to analytics work (Calvard 2016).

The second practice of 'pursuing coherence' alludes to how HRAPs connect observations through data and other contextual cues in complex and sometimes novel contexts to achieve clarity and reconciliation in their accounts against the set goals through a range of discursive and cognitive practices. Pursuing coherence is characterised as bringing out the meaning by connecting divergent observations and beliefs into a coherent account. The third practice of 'setting up and delivering conversations' alludes to what is required to lay out the structure and successfully convey the vital exchanges and also relates to what needs to be done to set up the context and effectively deliver the appropriate conversations. This practice includes setting up the scene and crafting and persuasively delivering analytical stories through discursive and cognitive activities supported by appropriate TTAs.

HRAP's sensemaking and sensegiving often involve navigating interdependent and often contradictory experiences when executing their role. The fourth practice of 'navigating paradoxes' involves acknowledging the coexistence of these contradictions, enabling HRAPs to make sense of analytics complexity. Findings suggest that while making and delivering the sense, applying a paradoxical mindset via reflexive practices as part of the sensemaking and sensegiving experience helped HRAPs to better capture the complexity of the organisational issues as part of their role. The study also identifies HRAPs' reflexive use of TTAs as they are engaged in a series of practices through the fifth practice of 'sensible enactment through material support'. From a human-centric perspective, the study draws attention to the HRAPs' perceived affordance of TTAs through reflexive practices to enhance their sensemaking and sensegiving capacities.

1.6 Key Theoretical and Practical Contributions

The research contributes to existing research on HRAPs, their sensemaking and sensegiving by exploring their cognitive, discursive and material practices, how they are manifested and through which activities they perform their roles through revised HRAPs sensemaking and sensegiving framework. First, the research demonstrates how 'performing reflexive conversations' develops a variety of sensemaking and sensegiving skills by balancing the HRAP's thinking and doing interface and provides a means to reconstruct sensemaking and sensegiving experience. The study explains how HRAPs reflexively use various practices to support sensemaking and sensegiving efforts. These practices and underlying activities of 'pursuing coherence', 'setting up and then crafting and delivering the conversations, are reflexively connected since they co-occur to support HRAPs' sensemaking and sensegiving as the fundamental organising principle of human cognition to extract meaning from the data and guide action (Boland and Tenkasi 1995; Weick 1995).

Further, the study provides insights into sensemaking practices that HRAPs used to make paradoxes salient and how these paradoxes are managed through reflexive practices. By illustrating and elaborating on paradoxical navigation, research shows how HRAPs manage various types of paradoxes through varying coping practices.

The study demonstrates that HRAPs' accepting paradox proved vital, thus allowing an opportunity to exploit contradictions in their favour. This understanding aided HRAPs in realising the positive outcomes from these tensions and contradictions through both/and approaches amid continuing coping mechanisms.

Second, the study suggests that HRAPs' sensemaking is achieved through specific meaning practices augmented by tools instead of cognition or social interaction alone. The study argues that HRAPs' sensemaking is neither achieved through cognitive nor discursive means alone, but in practice, it is manifested through cognitive-discursive practices (Sandberg and Tsoukas 2020; Weick 2022). Furthermore, it provides a deeper understanding of conceptual changes in HRAP's cognitive mechanisms and the range of discursive activities enacted to support each other through 'pursuing coherence' and 'setting up and delivering conversations'. Third, from a human-driven perspective, the framework shows how HRAPs reflexively deploy TTAs to increase their capacity for sensemaking and sensegiving. The empirical findings lead to a better understanding of conceptual changes in HRAP's cognitive and discursive mechanisms while engaging with TTAs when making and giving sense. HRAPs' activities demonstrate how external cognitive artefacts are engaged reflexively to amplify sensemaking (Stigliani and Ravasi 2012; Parsons and Sedig 2014) and sensegiving capacity (Kaplan 2011).

Thirdly, the study also advances the argument that, in practice, sensemaking and sensegiving activities form bases for each other and are less distinct domains as one implies the other (Maitlis and Christianson 2014; Sandberg and Tsoukas 2020; Schildt et al. 2020). The boundaries between sensemaking and sensegiving are pierced by the other and become less distinct as one implies the other (Maitlis and Christianson 2014; Sandberg and Tsoukas 2020; Schildt et al. 2020). While doing so, the study attempts to address Bosma et al. (2016) question of how the HRAP came to make sense in the first place when giving sense. It considers sensemaking and sensegiving two mutually constituent and dependent phenomena when HRAPs make and give a sense. The study deepens the understanding that sensemaking and sensegiving are two sides of the same coin; each depends on and requires the other (Maitlis and Christianson 2014; Schildt et al. 2020).

From a practical perspective, first, the study offers a welcome social constructivist perspective on user-centred system design in experiencing technology by explicitly linking sensemaking and technological affordances. Second, the findings from this research can aid organisations in further maturing their HRA capabilities within their HR department by expanding the focus from viewing analytical practice as working with specialist analytical technologies and statistical tools in a socially decontextualised manner to more sociocultural practice. The sensemaking and sensegiving practices and underlying activities have considerable value from a training and recruitment perspective, particularly in developing social competencies and focusing on attracting the necessary talent to build HR analytics capabilities in the organisation. The study provides practical insights into HRAPs' ability to operate in their boundary-spanning role skilfully, opening the 'black box' of HRAPs' roles by providing an in-depth understanding of how the role is reflexively enacted through a set of five interlinked situated materially cognitive-discursive practices. More specifically, the study draws attention to the nuanced understanding of context underpinning the HRAPs' sensemaking and sensegiving, which have previously been recognised in the literature but not empirically developed. The thesis challenges the commonly held perceptions of analytics as purely technical function as working with specialist analytical technologies and statistical tools in a socially decontextualised manner. The study emphasises the importance of other skills, such as drawing on context, political awareness, stakeholder/s management and data storytelling when executing the role.

1.7 Thesis Plan

This thesis is organised into eight chapters and follows a logical structure to offer readers coherent insights into the research process and its outcomes. Figure 1-1 outlines the brief overview of each chapter. Chapter one introduces the study and provides an overview of its background, rationale, and significance. Then, the research aims and objectives are presented, followed by an outline of the research methodology. Towards the end of this chapter, key findings alongside key theoretical and practical contributions are outlined. The second chapter examines the existing literature on HRA. The review develops along four relevant lines of research into the HRAP role – background, its emergence, what it entails and analytical capabilities and highlights the gaps in the extant literature.

The third chapter presents the literature review on sensemaking, sensegiving, and reflexivity and offers a conceptual understanding of theoretical anchors. This chapter provides theoretical frames for this research study by reviewing the cognitive, discursive, material, and reflexive dimensions. After reviewing the literature, Chapter Four brings together the elements discussed in the second and third chapters to develop the conceptual framework that helps anchor the findings of this research study. Chapter Five discusses and justifies the applied epistemological, ontological, and interpretative philosophical perspectives. It argues for a qualitative research design, explaining the empirical data collection and analysis process. The chapter also discusses the trustworthiness of this research alongside ethical issues such as confidentiality and anonymity.

Chapter Six presents the findings of this research. It presents the themes extracted from the extended semi-structured narrative of practice interviews and data analysis, thus providing an empirical foundation for developing the framework as an outcome of this study. After analysing the empirical data, Chapter Seven discusses the findings in the form of a framework compared to the literature review. It presents similarities confirmed during the study, enriches existing research with additional insights, answers the research questions and sets a foundation for the research contribution. Chapter eight concludes by summarising how the research aims and objectives were met. It presents the novelties, contributions to theory and practical implications for practitioners. Limitations of the study are laid out alongside potential directions for further research resulting from this research.

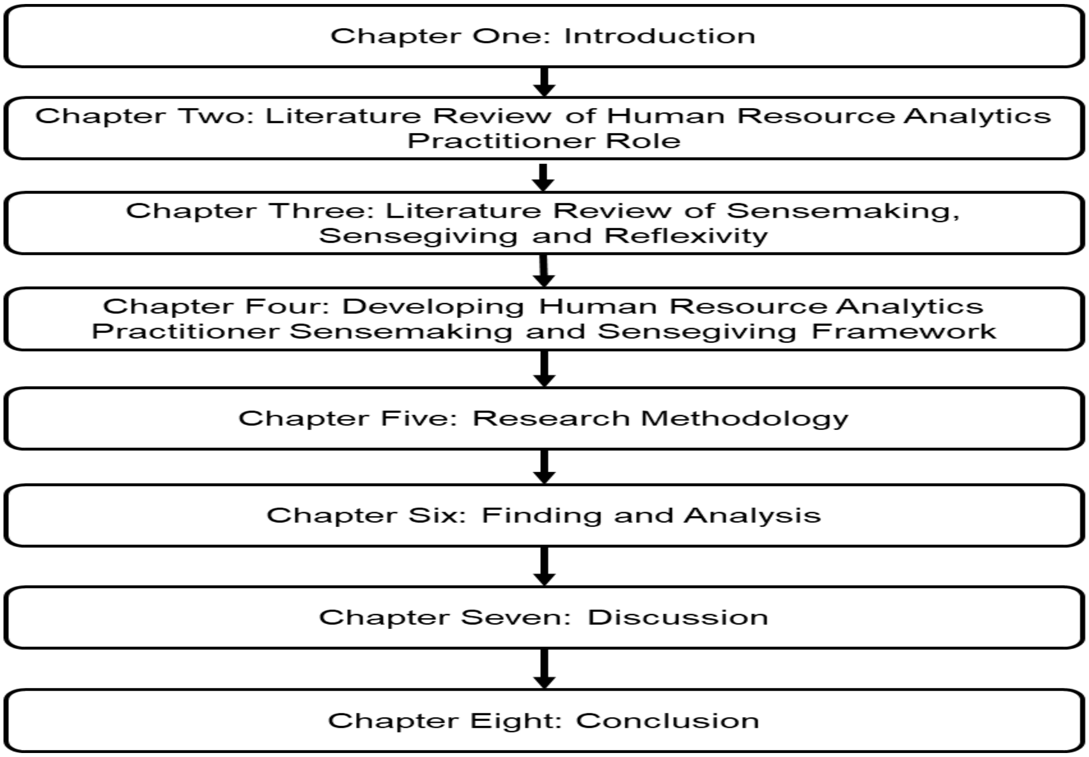


Figure 1-1: Thesis Plan

Chapter 2 Literature Review of the Role of Human Resources Analytics Practitioner

2.1 Introduction

This chapter sets the context for the study by reviewing the literature on HRA and the role of HRAP. The literature review starts with the growing importance of HR analytical capability as a strategic organisational ability to harness the potential value from the data, resulting in the emergence of the role of HRAP. Then, moving further, the review examines what the HRAP role entails. In this regard, the literature draws on four critical elements of the role, i.e., understanding the business context, identifying and gathering data, performing data analysis and then offering insights from data. While going in-depth, the review further discusses the impact of HRAP's role in the organisation and recognises its potential to provide insights about human capital to shape the organisation's business strategy meaningfully. Towards the end of the chapter, the literature review draws attention to the importance of human capabilities to realise the value offered by HRA. It identifies the gap in the current literature when examining the HR analytics role from a human capability perspective. Besides identifying the gaps, the review concludes that the role of HRAP practitioners also offers an exciting opportunity to study how HRAP assign meanings to events/situations for themselves and others as part of their role.

2.2 Human Resources Analytics – Background

In this increasingly competitive globalised world with the advent of big data (BD), data has become a vital tool in creating value for the business, which has led to the realisation of data analytics as a strategic organisational capability (Calvard 2016; Wenzel and Van Quaquebeke 2018; Nocker and Sena 2019). This strategic ability includes the organisational capacity to analyse data to understand the efficacies of various organisational interventions, assess various policies, procedures and practices, analyse market dynamics, and align products and services with changing market patterns (Calvard 2016; Raguseo 2018). As a result, business functions such as sales, customer service, information technology, marketing, supply chain, production, and research and development rely heavily on analytical approaches and practices (Pape 2016).

The human resources function has also joined this trend owing to the digitalisation of HR (Marler and Boudreau 2017), with an increasing interest in optimising employees' contribution as a resource, using data analytics processes of various sophistication (Boudreau and Cascio 2017; Davenport and Harris 2017; Levenson 2018; Jörden et al. 2021). Besides this, there are other dynamics both within and outside the organisation driving the need for data to drive the organisation's decisions, such as the globalisation of the workforce, increased competition for talent, skills gaps within and outside the organisation (Isson and Harriott 2016), continuous pressure for increased effectiveness and productivity (Mayo 2018), and complexity attached to human behaviours and their predictability (Gandomi and Haider 2015).

There are some examples of analytical approaches/practices in HR, such as HR utility analysis (Cascio et al. 2019), HR scorecards (Becker et al. 2001) and HR metrics (Lawler et al. 2004). In addition, there are a variety of ways in which the analytical approach in HR is generally referred to, e.g., terms such as "HR Analytics, Workforce Analytics, Talent Analytics and People Analytics" (Marler and Boudreau 2017: 6). All these terms describe the application of analytics practices to HR data in conjunction with business data by making data about employee characteristics, behaviour and performance easy to access, interpret and take action on (Rasmussen and Ulrich 2015; Pape 2016; Schiemann et al. 2018).

The study uses the term HRA, as it is widely recognised and accepted terminology, maintaining functional identity with the HR function. Within the existing HR analytics literature, there are two views concerning the conceptualisation of HRA. For example, some scholars such as Marler and Boudreau (2017: 15) have referred to HR analytics as an "HR practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organisational performance, and external economic benchmarks to establish business impact and enable data-driven decision making." Other researchers have argued that HRA is "a process that is continuously advanced by improving problem-solving through sound measurement, appropriate research models, systematic data analysis, and technology to support organisational decision-making" (McIver et al. 2018: 406).

From a human-centric approach to analytics, the study is not interested in the debate of calling HRA a process or practice. Instead, the working definition adopted for this study defines HRA as a data-driven practice/process ranging from simple reporting of HR metrics to predictive modelling, enabled by various tools and technologies to create better workplaces and achieve organisational outcomes

(Marler and Boudreau 2017; CIPD 2018; Huselid 2018). In other words, HR analytics is the interpretative process of seeking comprehension about reality through examining data for relationships and trends in a given context (Grolemund and Wickham 2014).

While there is excitement around analytics in HR, the literature also points towards challenges with its adoption. Unlike other functional areas such as finance, sales, marketing and supply chain, which have a long history with well-developed terminology, methods, processes and impact when it comes to analytical function and analysis, analytics in HR, in contrast, is a relatively new and growing practice in terms of methods, tools and their impact (Pape 2016; Huselid 2018). There are some examples of analytical approaches in HR, such as HR utility analysis (Cascio et al. 2019), HR scorecards (Becker et al. 2001) and HR metrics (Lawler et al. 2004). These approaches largely remain in practitioners' literature and have not received much attention from academic scholars (Marler and Boudreau 2017).

On the other hand, despite HRA being in its infancy stage compared to other functions, its adoption is a growing trend owing to the increased digitalisation of HR and organisations' growing appetite to use data in HR to drive business and employee outcomes (Marler and Boudreau 2017; Cascio et al. 2019). Fuelling this trend is the rise of workplace technology such as human resources information system (HRIS), artificial intelligence, and cloud computing, allowing organisations to record and monitor individuals' behaviours and provide more significant insights into their performance, productivity, customer satisfaction, employee well-being and innovations (Nocker and Sena 2019; McCartney et al. 2021; Rosett and Hagerty 2021).

HRA advocates maintain that it embodies an opportunity for the HR function to contribute in more quantifiable and concrete terms (Schiemann et al. 2018; Edwards and Edwards 2019), particularly when there is a prevailing argument to replace managerial intuition and gut feeling in HR practice with more evidence-based practice (Pfeffer and Sutton 2006; Rasmussen and Ulrich 2015). They further argue that HRA significantly brings increased rigour and objectivity to business decisions through data-based analytics and insights (Jörden et al. 2021; McCartney et al. 2021), complementing and balancing the prevailing intuition and gut feel in HR practice. HRA can improve the functioning of the HR department by helping organisations to assess the impact of HR practices through intelligent use of data, metrics and statistical tools, with the assistance of technology, and help HR function to catch up with other analytically oriented functions (CIPD 2017; Cascio et al. 2019).

As outlined in Figure 2-1, HRA's widely endorsed application of analytical support includes descriptive, diagnostic, prescriptive and predictive analyses (Falletta 2013; CIPD 2018; Cascio et al. 2019). The descriptive analysis deals with the data related to past events, e.g., employee turnover data or the cost per new hire. The diagnostic study typically represents the root cause analysis to determine why something happened, e.g. the reasons for an increase in unwanted employee turnover (CIPD 2018). Prescriptive analyses are used to design initiatives for fixing current issues (Isson and Harriott 2016). An example could be a model to understand what alternative employee training investments could improve their sales output. The predictive analysis analyses the causes of historical trends and forecasts whether they will persist or change independently (King 2016; Edwards and Edwards 2019), e.g., predicting employee turnover in three to five years (Khera and Divya 2018).

Therefore, this increased relevance and demand for HRA as an organisation's strategic capability has led to a new and distinct role within organisations, i.e. HRAP/HR analysts. (Angrave et al. 2016; Van den Heuvel and Bondarouk 2017; Huselid 2018; Edwards and Edwards 2019). The role carries the potential to impact business outcomes through its analytical capabilities (Van den Heuvel and Bondarouk 2017) and facilitate the execution of business and HR strategy (Levenson and Fink 2017; Minbaeva 2017; Levenson 2018).

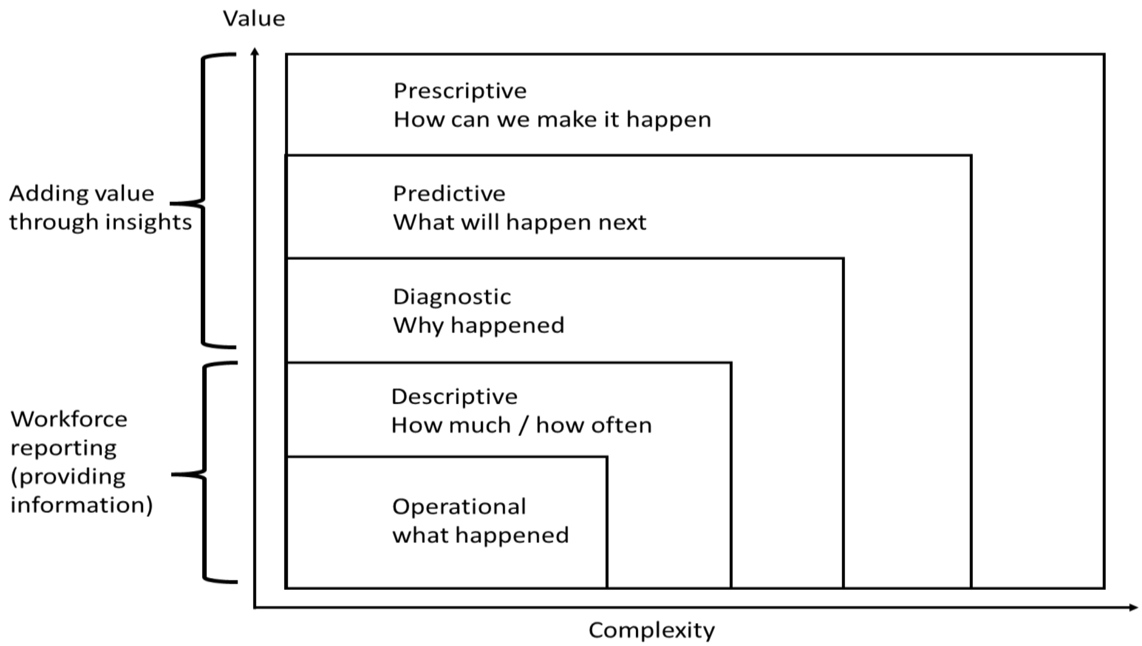


Figure 2-1: Types of Analytics – Complexity and Value

2.3 Human Resources Analytics Practitioner Role – Emergence and Importance

The HRAP role is tasked to help organisations improve their outcomes by making data about employee characteristics, behaviour and performance easy to access, interpret and make and monitor data-led interventions (Rasmussen and Ulrich 2015; Pape 2016; Schiemann et al. 2018). HRAP provide senior managers, HR teams and line managers with the required information to make decisions related to a broad range of issues in the business (CIPD 2018). There is consensus regarding the areas where HRAPs potentially offer their contribution (Isson and Harriott 2016; Simon 2017; Huselid 2018; McIver et al. 2018), as listed below:

1. Develop relevant data and analytics products and services to resolve HR and business issues and facilitate business decisions making.
2. Translate unstructured business problems into analytical question/s, which can be addressed through the data.

3. Assess the feasibility of new business strategies and initiatives and facilitate management to design, implement and monitor HRM programmes and initiatives efficiently and effectively.
4. Allow the business and HR to measure the effectiveness and efficiency of HR operations and services that rely on data.

HR professionals are increasingly interested in improving HR effectiveness and efficiency, so HRAPs can facilitate this by evaluating the HR operational performance (Kryscynski et al. 2018). For example, they can enable HR teams to measure and explain policies and processes' impact on the workforce and organisational performance and demonstrate the return on investment for various activities (CIPD 2018). As outlined in Figure 2-2, Isson and Harriott (2016) identified several areas of the employee life cycle where HRAPs can create value, namely HR planning, employee acquisition/hiring and onboarding, employee engagement, turnover and retention, performance management and development, succession management, and employee health, safety and welfare. Isson and Harriott (2016) further argued that there is no specific order for these areas to seek attention; instead, organisational priorities in these areas and the maturity of analytics may help define the focus for HRAP.

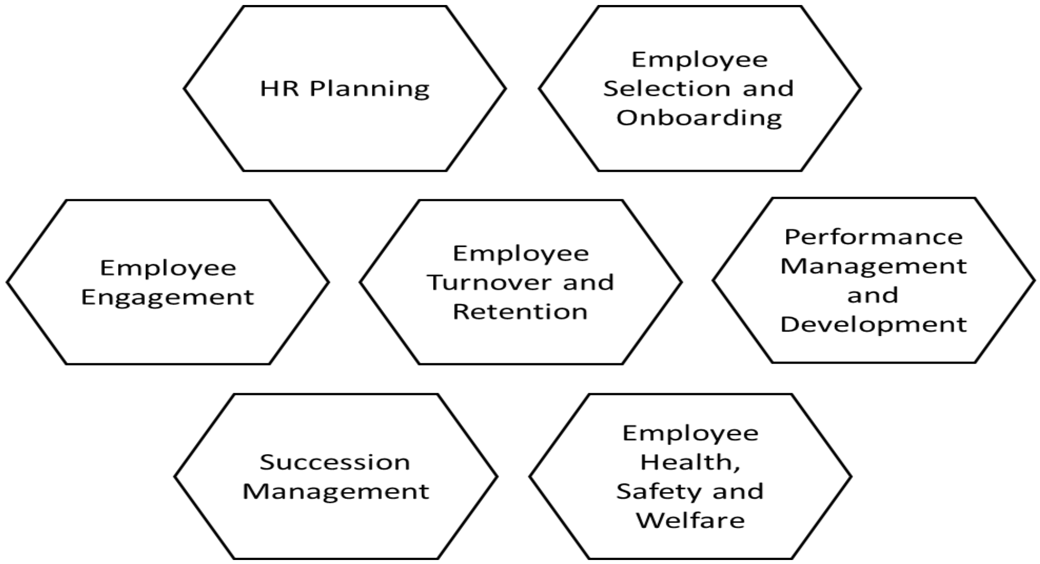


Figure 2-2: Human Resources Analytics Application

The above argument is justified by the evidence regarding HRAP's strategic contributions through their ability to identify and address workforce challenges by transforming data into information and insights for informed decision-making (Marler and Boudreau 2017; Huselid 2018; Kryscynski et al. 2018). For example, to improve their current practice, Google's HRA team has designed an evidence-based recruitment and selection practice by establishing several high-performance indicators that could forecast a candidate's chance of success (Shrivastava et al. 2018) and how analysts put into practice machine learning to improve hiring decisions (Pessach et al. 2020). Similarly, in addition to recruitment and selection, HRAPs have addressed various other HR challenges, including strategy execution (Levenson 2018), diversity and inclusion (Buttner and Tullar 2018), solving various business challenges (Schiemann et al. 2018; Simón and Ferreiro 2018).

On the other hand, many researchers have argued that, generally, analysts have struggled with interpreting the data to their strategic advantage; as a result, often deployed analytics processes do not go beyond tactical value to gain insights on people-related issues in the business (Rasmussen and Ulrich 2015; Marler and

Boudreau 2017; Schiemann et al. 2018). Despite being an increasing trend and the excitement around analytics within the HR domain and the growing importance of analytics roles, using data to make human resources decisions still presents a challenge for HRAP (Angrave et al. 2016; Marler and Boudreau 2017; Kryscynski et al. 2018; Minbaeva 2018; Edwards and Edwards 2019). The below sections outline different elements and constituents of the role to help appreciate the nature of these challenges.

2.4 Roles and Responsibilities of Human Resources Analytics Practitioner

The HRAP role sits at the confluence of business needs, the organisation's internal and external human resources landscape, and data and technological infrastructure. Furthermore, the role is characterised as boundary-spanning as it needs to collaborate with various organisational functions, thereby requiring abilities that can transcend various functions (Minbaeva 2018). Due to these emerging role requirements, in the last two decades, the characterisation of the HRAP role has evolved owing to increased digitalisation, leading to analytic sophistication and the increased relevance of HRA in organisations (Minbaeva 2018; Margherita 2022). On a broader level, four responsibilities have been generally associated with the HRAP role (Kryscynski et al. 2018; Falletta and Combs 2021). These responsibilities, as outlined in Figure 2-3, are:

1. Understand the business context, i.e., how different organisational systems/process components operate to generate business outcomes through critical casual thinking.
2. Identify and gather the required data, as not every piece of data is relevant and valuable, through quantitative and qualitative means.
3. Perform analysis identifying causal relationships between variables through sound measurement principles (psychometrics and econometrics).
4. Ensure a process for communicating and translating analytics insights into organisational decision-making exists.

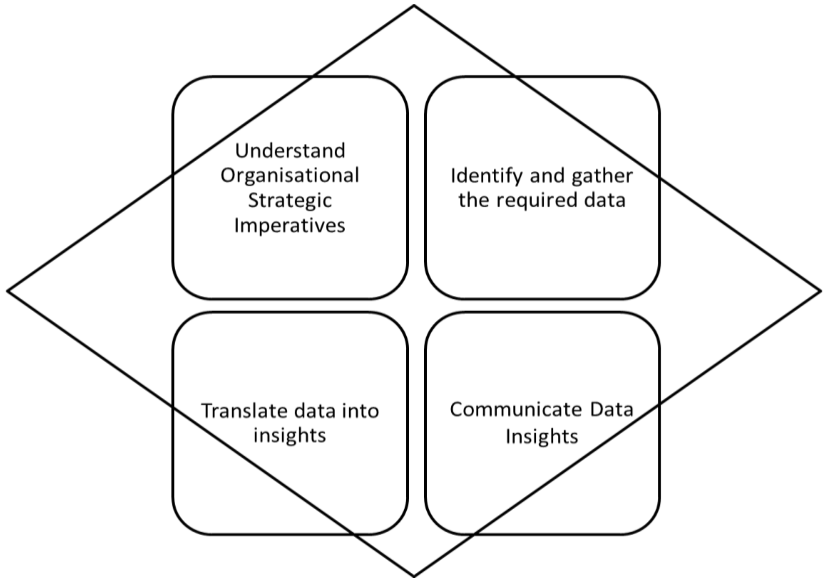


Figure 2-3: Human Resources Analytics Practitioner Roles and Responsibilities

2.4.1 Understand Organisational Strategic Imperatives and Business Context

Analysts are expected to create the connective tissue between the strategic and operational aspects of the business (Isson and Harriott 2016) and develop an understanding of how the human side of the business connects to these issues to have a pivotal impact on actual business results (Rasmussen and Ulrich 2015; Ulrich and Dulebohn 2015). Analysts are often blamed for starting their analytics endeavours by collecting data without understanding the business challenges that need their attention (Isson and Harriott 2016). HRAPs must understand organisational strategic imperatives with deep content expertise (Rasmussen and Ulrich 2015). Analytics practitioners need business acumen and applied research skills to understand better the business strategy to translate strategic challenges into analytic questions that need answers (Andersen 2017; Green 2017; Jorrit van der and Rasmussen 2017).

In this regard, Rasmussen and Ulrich (2015) and Cascio et al. (2019) suggest that analysts must work with a defined logic representing the questioned business issues. While high-quality measures and sophisticated analytics can reveal valuable insights about the data, the appropriate reasoning and logic help target the analytical process to the most relevant and vital business issues the organisation faces (Isson and Harriott 2016). Establishing connections to the organisation's pivotal issues, finding their root cause/s and working towards desired outcomes/actions through critical thinking are essential aspects of logic used in analytics practice (Becker et al. 2001; Boudreau and Jesuthasan 2011).

For HRAP, making data analytics more business-focused and relevant is mainly an issue of contextualising the data in a sense that the significance of a given piece of information/data depends on what else is occurring, what else might be occurring, what has already occurred, and what the observer anticipates or plans to occur (Woods et al. 2002). It is not enough to have numbers and sophisticated analysis of those numbers; understanding the underlying context and reasoning guiding the analytical process must be understood to address the business problem (Andersen 2017; McCartney et al. 2021). This contextual understanding helps analysts set the analytical process's scope and determine the required resources to execute the analytical task (Angrave et al. 2016; King 2016). As part of contextualising data, it is critical to understand the business process that resulted in data creation or how it came into being (Strohmeier and Piazza 2013). Connecting data to the organisational context makes the analytical task more meaningful, increases the probability of success and reduces the chances of rework (Isson and Harriott 2016).

Analysts need to draw a clear representation of the business issues while engaging with context and the relevant stakeholders and then explore the possibility of using analytics to guide stakeholders to informed decision-making (Boudreau 2010; Boudreau and Jesuthasan 2011; Ulrich and Dulebohn 2015). While understanding the context, the analytical process also demands that HRAPs assess the impact on affected stakeholders (Boudreau 2010). Attending to relevant stakeholder issues and concerns has been a key feature of analytics practices (Rousseau and Barends 2011). According to Rasmussen and Ulrich (2015), before even defining and interpreting the relevant data, it is critical to engage with key stakeholders and decision-makers to understand the organisational issues and their associated context, which needs attention. For example, Davenport and Harris (2017) highlighted the importance of having multiple and diverse stakeholder interactions to understand the organisation's strategic and operational imperatives. It means engaging with business leaders and asking questions to understand their expectations, potential business risks and challenges. Besides managing stakeholders' expectations, analysts must be good at respecting expertise beyond their own and must have collaborative problem-solving skills to foster trust and transparency with relevant stakeholders, owing to the cross-functional and interdisciplinary nature of the role (Mishra and Lama 2016; Durai et al. 2019).

2.4.2 Data Management

Data management is extracting or collecting appropriate data/information based on correct psychometrics and econometrics measurement principles using the right tools (Cascio et al. 2019). Data under its specific attributes in consistency and precision allows analysts to reach out to cues and reduces the tendency for them to be distracted (Grolemund and Wickham 2014). McCartney et al. (2021) have identified this ability of analysts to extract and work with large data sets as data fluency. Multiple tools are available at the analyst's disposal for data extraction from source and organising it, such as TOAD, Python, R, Microsoft Access, SAS/SPSS and Crystal Reports (Corrigan 2015). HRIS can regularly store data in one place, which makes data acquisition relatively faster and effortless (Fitz-enz and Mattox 2014). However, data in one place does not mean it is ready for analytics, as quality and relevance are vital parameters besides checking the missing data (Pape 2016). Analysts must identify which data is valid and reject the data that may not be useful or relevant for addressing the business issue (Isson and Harriott 2016). Erroneous or irrelevant data may lead to incorrect interpretation (Strohmeier and Piazza 2013).

Data becomes quite relevant in the analytical process as the success of any analytical endeavour hugely relies on the quality of data (Marx et al. 2011; M. Olszak and Ziemba 2012; Ramakrishnan et al. 2012). For analysts, understanding the nature and scope of data and its sources is considered a significant prerequisite to integrating and synthesising various categories of data ranging from employee-related to business performance (Strohmeier and Piazza 2013; Isson and Harriott 2016). Figure 2-4 outlines that data can be generated from internal and external sources (March and Hevner 2007). Internal sources are corporate accounting, financial systems and business productivity data related to employees and business (Isson and Harriott 2016; Pape 2016). Within the employee domain, typical examples are workforce salary and benefits costs, employee turnover, organisational structures and span of controls, talent profile data, recruitment costs, quality of hire, employee engagement scores, productivity ratios, employee learning and development, succession planning, employee turnover, diversity, performance assessment and employee well-being (Isson and Harriott 2016). Examples of data from the business front include sales performance, net revenues, customer bases (new, existing, and repeat customers), average order size, product diversity, sales revenue, gross margins, net profit and stock price (Becker et al. 2001).

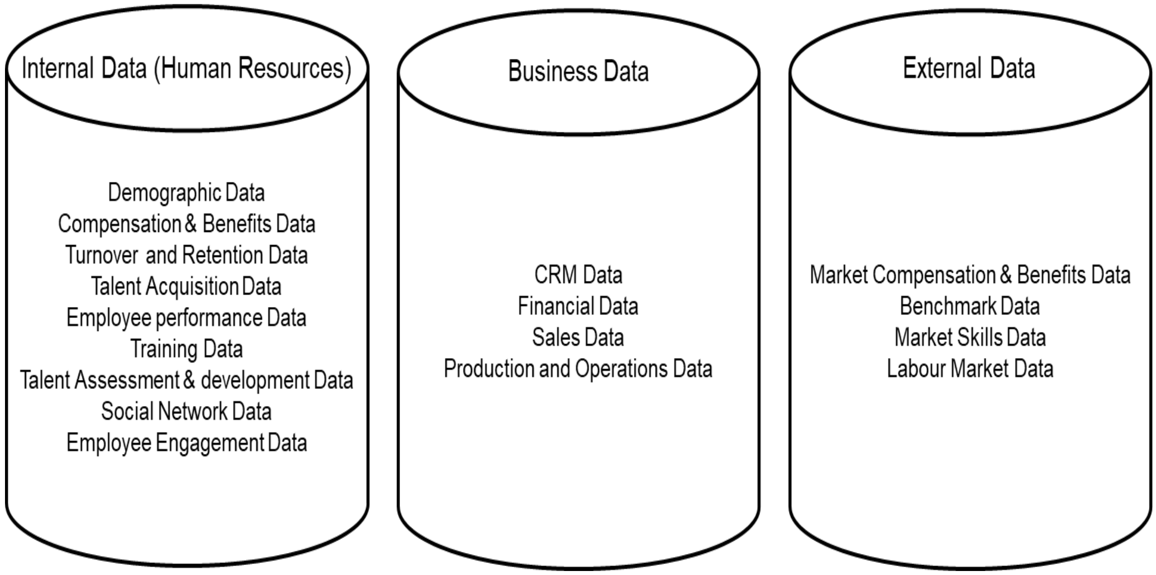


Figure 2-4: Data Sources

On the other hand, external data includes analysis of markets, technologies, competitor performance data, comprehensive financial data, and changes in the world economy from employee and business perspectives (CIPD 2018). External data from an employee perspective include publicly available social media data, candidates' social media profiles, labour market data, employment and unemployment rates, job openings and benchmark data for employee turnover and compensation data (Isson and Harriott 2016). Another form of data is typically generated through simple surveys, unstructured interviews and observations (Anderson et al. 2020).

For any analytical task, the business logic dictates the sources and nature of the data (Isson and Harriott 2016). Researchers have recommended that HRAPs move beyond traditional isolated HR reporting and transcend functional boundaries by integrating the "outside in" approach with business analytics (Rasmussen and Ulrich 2015). HRAP either use existing data sources available (supply-driven), systematically explores data needs (demand-driven) or combines both in a meaningful manner (Pape 2016). Not all the data items are equally helpful, and HRAPs sometimes draw on data used for other purposes and, on other occasions, collect new data to meet a specific requirement (Andersen 2017). Similarly, the time, cost and effort to secure the required qualitative and quantitative data are also crucial for analysts (Anderson et al. 2020). These elements of time, cost and effort make it imperative for analysts to be prudent about the data they aim to utilise as part of HRA (Pape 2016).

2.4.3 Transforming Data into Insights

The HRAP need to have a process of translating analytical results into actionable insights to facilitate managers to plan, implement and monitor various business initiatives (McCartney et al. 2021; Rosett and Hagerty 2021). When transforming data into insights, the analytic process's science and art elements are combined to convert the data into something meaningful for the targeted audience through information processing (Fitz-enz and Mattox 2014; Calvard 2016). Data alone may not answer what is going on, as insights from data need to be interpreted within the organisational context (CIPD 2018). Generating insights through data analysis involves summarisation and manipulation that takes the raw data, shows relationships, trends, and graphical and tabular representations, and forms the basis for further communication using statistical and computational tools SAS, SPSS, Tableau, Power BI and even the ubiquitous Excel (Corrigan 2015; CIPD 2018).

In the analytical process, this data transformation involves statistical and computational activity and human cognitive processing (Grolemund and Wickham 2014). Stressing the importance of the human interpretative aspect in information processing, Weick (2009) cautions against the tendency to neglect interpretative aspects of information processing in data analysis. Data analytics also involve human intervention to build a logical understanding of the information at hand and the problems that need to be solved through clever technological manipulation and interpretation of data. Cascio et al. (2019: 12) define analytical ability through the "LAMP framework" as having the capacity to (a) establish a causal "logic" for linking different organisational system components, (b) use appropriate "analytics" to test causal relationships, (c) use the right measures, and (d) incorporating insights into organisational decision-making. In this regard, the research has focused on the HRAPs' ability to undertake a necessary analysis based on the appropriate measures, comprehension of the principles of good measurement (psychometrics and econometrics), estimating causal links, and critical causal thinking. It takes applied researcher skills from HRAP with a social, behavioural and organisational sciences background and HR functional expertise to interpret the insights (Jorrit van der and Rasmussen 2017; Rosett and Hagerty 2021).

Furthermore, when transforming data into insights, data analysis is also driven by analytical logic, i.e., the applied analytical method to work with entire data sets instead of just collecting data points they can mentally attend to (Grolemund and Wickham 2014). It can also help analysts reduce the subjectivity of the data analysis process by allowing inference from the data reliably and consistently (Rosett and Hagerty 2021). Broadly, there are two types of analytical approaches, i.e., confirmatory analysis, which seeks to validate the hypothesis against the data, and exploratory analysis, which seeks to find the pattern that explains the data (Grolemund and Wickham 2014). Both analytical techniques would require critical thinking, backed by a decision framework that highlights assumptions, for a more accurate evaluation of the issue and interpretation of the facts and data. (Rosett and Hagerty 2021).

As part of the analysis, HRAPs face the inherent paradox wherein some would argue that metrics and quantified data are reductive and of questionable value in managing human resources, while others would only be interested in quantitative data (Angrave et al. 2016). Fitz-enz and Mattox (2014) and King (2016) have pointed toward managing the complexity attached to human behaviour. There is an established concern that the organisation's implicit understandings, the qualitative and subjective experiences and emotions of people, can be overlooked in quantitative analysis (Greasley and Thomas 2020). Thus, some analysts in these cases are much more committed to qualitative analysis that can help explain rather than measure changes and outcomes (Kryscynski et al. 2018). The implications for analysts are significant, specifically in light of their ability to understand and meet the data needs of the different stakeholder groups based on their individual needs (Davenport and Harris 2017). Some stakeholders might prefer quantitative findings over qualitative findings and vice versa to drive their decision-making (Greasley and Thomas 2020).

Furthermore, the output of data analysis needs to be interpreted and understood in the given business context and against the initial objective of the analytical process (CIPD 2017). According to Isson and Harriott (2016) and CIPD (2018) key questions that need attention are: what is the output revealing in a given business context? Is there additional data required? Is there any additional context missing, and is this an actionable result?

2.4.4 Communicating Insights

In an analytical context, there is a potential lop-sidedness of knowledge between those creating and those consuming it. Many researchers argue that the science of advanced analytics is not an easy concept or technology for business managers to comprehend and act on; while they may be experts in their area, they are unlikely to be experts in data analysis and statistics (Rasmussen and Ulrich 2015; Ulrich and Dulebohn 2015; Calvard 2016). Some researchers have warned against analysts assuming the significance of the results will be compelling enough for the targeted audience to accept and act on the findings (Green 2017; McCartney et al. 2021). Even if it turns out to be successful, such an approach can lead to ignorant acceptance as opposed to a deeper understanding of necessary action and follow-up. This knowledge gap highlights the need for analysts to be innovative in their communication approach.

Therefore, an essential step in any analytics practice is ensuring a process for incorporating the insights from analytics into organisational decision-making by presenting information to relevant stakeholders to help them make decisions (Boudreau and Ramstad 2005; Boudreau and Jesuthasan 2011). Generating insights is not enough; there needs to be a process for communicating the information so stakeholders outside HR will act on it (Boudreau 2010; Isson and Harriott 2016). Similarly, without undermining the importance and requirement of statistical expertise and the associated tools, analytics is also about conveying data-driven insights and recommendations to an audience persuasively so that the audience stays interested and engaged to retain and act on the recommendations given (Knaflic 2015; Welbourne 2015). In this way, analytics may be viewed as a communication apparatus, combining information from the analytical process to accurately represent a current business reality and a likely future while addressing the business challenge (Fitz-enz and Mattox 2014).

Furthermore, the presentation of the outcome of an analytical exercise should not be treated as simply a reporting exercise of presenting data in black-and-white numeric tables. Prior research has drawn attention to the practitioners' challenges while communicating the findings due to the overall complexity of data analytics (Calvard 2016). In this regard, the extant literature suggests HRAPs construct a story that frames the analytics findings to build a more comprehensive understanding and mobilise support (Andersen 2017; Green 2017; McCartney et al. 2021). If analytical insights and findings are not compelling and easy to understand, end users will not act on them (Welbourne 2015). Making findings simple from data analysis can become challenging, as besides having the statistical/numerical competencies, analysts must have the business knowledge to contextualise the findings (Rosett and Hagerty 2021). Researchers consider HRAPs' competency to understand the business context to turn raw data into simple, actionable findings to communicate to the targeted audiences as essential (McCartney et al. 2021).

Analysts need to manage the process of converting vast amounts of complex data into simplified and actionable insights for decision-making, and in this regard, the research draws attention to the application of the analytical storytelling approach

(Welbourne 2015; McCartney et al. 2021). In the current era of digital analytics, it is seen to be one of the most important abilities for data analysts to have the capacity to tell a captivating story using data (Knaflic 2015). Researchers refer to storytelling as a fundamental communication activity for analysts based on their ability to tell a story correctly at the right time and place (Andersen 2017; Green 2017; McCartney et al. 2021). As part of storytelling through data, analysts are also advised to use various discursive means and devices to persuade others, such as mapping meaningful facts (Boudreau 2010) and metaphors (Boudreau and Jesuthasan 2011). At the same time, there is a dearth of empirical evidence, potentially limiting the understanding of how analysts convey analytical outputs to audiences (McAfee and Brynjolfsson 2012; McCartney et al. 2021).

As part of storytelling, it is critical to go beyond reviewing the data results and establish a connection with the audience to guide and motivate them towards informed decision-making (Welbourne 2015). This process of relating to the audience can be critical because when analysts rely solely on facts, statistics, and theories to persuade an audience, they may reject these findings in favour of their theories and beliefs (Andersen 2017; Boldosova 2019). This inertia and indifference towards data from the audience can potentially be mitigated by adding context and making the results more accessible and relatable through visualisation (Welbourne 2015; McCartney et al. 2021).

Data visualisation tools support the currently reported means of communicating data insights (Kaplan and Orlikowski 2014; Knaflic 2015; Dalpiaz and Di Stefano 2018). This communication process through visualisation is not simple, as analysts must work with extensive data to explain trends and patterns to the target audience to facilitate comprehension (Mirkovski et al. 2019). The most popular visualisation tools in data analytics are dashboards (CIPD 2018). Dashboards allow analysts to efficiently analyse their data from various areas of complicated datasets by combining visual elements (such as charts or tables) on a single display (Wexler et al. 2017). Nevertheless, untrained audiences cannot interpret simple collections of visual representations; to become meaningful, they require interpretation and explanation (Mirkovski et al. 2019).

2.5 Human Resources Analytics Capabilities – The Human Factor

Although organisational data analytics capabilities are collective, they are rooted in the HRAP's skills and their application, which forms a crucial element in the analytical puzzle (Minbaeva 2018). For analytics success in HR, organisations must link their data analytics with their strategic vision, business strategies and HR strategy while embracing analytics-driven organisational culture and capabilities (CIPD 2017; CIPD 2018). Accordingly, building an individual analytical capability is pivotal in driving the success of analytical efforts (Andersen, 2017; van der Togt and Rasmussen, 2017; McIveret al., 2018; Minbaeva, 2018). As part of building capabilities, this raises key questions for HRAPs: what must they implement to deliver on the HR analytics promise? How can they benefit from HRA's rising success? Therefore, as in the case of any other analytics context, the human-centric focus in HRA is particularly important to explore the emerging role of HRAP amid the expectations of raising the analytical capabilities in organisations.

The HRA process's purpose is not limited to managing the data processing and information sharing through relevant technologies. It also involves converting data into valuable insights through human analysis and associated practices (Kryscynski et al. 2018; Minbaeva 2018). For insights to surface, having data, information and analytical tools is insufficient, thus creating a need for active involvement of the human element to discover the relevant insights for knowledge creation. In this regard, McAfee and Brynjolfsson (2012) argue that, although technology has made it possible to use robust, intricate, and complex systems, the efficacy of computational and visualisation technologies does not deny the need for human intervention and intelligence, paving the way for human-centric focus in data analytics. Notably, as Durai et al. (2019) highlight, novel insights are more likely to be generated through analysts' curiosity, producing new streams of exploration instead of merely depending on technical tools and algorithms. Contributing to this debate, McCartney et al. (2021) also emphasise many non-technical factors that can potentially contribute to developing analytical capabilities as it is not always about data and technical skills; instead, soft skills such as consulting, storytelling and business acumen are equally as important.

While examining the analytics process or analyst's role, non-technical attributes, such as how analysts collect environmental cues, manage stakeholders' expectations and draw support for their projects, have not been given due attention due to technology and tools-related expertise dominating the non-technical expertise (Nelson 2018). At the same time, the literature seems divided on the relative importance of HR domain expertise and statistical/methodological expertise. For instance, Rasmussen and Ulrich (2015) argue that acquiring analytical domain knowledge with statistical skills is more straightforward than HR functional expertise. On the contrary, Levenson (2005) cautions against hiring practitioners lacking statistical knowledge and expertise because these people may not offer the right insights. Further adding to this division is the background of HRAP, who come from various disciplines, e.g., marketing, HR and organisational behaviour, industrial and organisational psychology, economics, finance, statistics, data science, and computer science (Kryscynski et al. 2018; McCartney et al. 2021).

Furthermore, the value of HR analytics does not lie in gathering the required data, creating extensive dashboards, or making predictive models through sophisticated tools; instead, it is about taking responsibility for driving the required changes in organisation culture, processes, behaviours and capabilities through analytical initiatives. It is vital for HRAPs to be more instrumental in creating impetus towards driving the changes in helping organisations to get the desired results by leveraging insights from data (Nelson 2018). While doing so, they are expected to communicate and coordinate with other functions within organisations, such as research and development, marketing and sales and finance, to drive synergy in analytical efforts and cultivate productive working ties with their analytical coworkers in these other functions. HRAPs must integrate evidence gathered with their expertise, context and stakeholder concerns to produce analytical results based on business needs (Ulrich and Dulebohn 2015). This requires the ability to operate beyond HR functional boundaries as effective boundary spanners to foster the creation of trust and maximise organisational buy-in (Minbaeva 2018). Therefore, the role requires HRAP to operate with sophisticated data analytical skills, high intrinsic motivation, and the ability to build and employ networks within and outside the organisation.

The extant literature has drawn attention to the fact that while there are perceived benefits of HRA, there are challenges in this opportunity to ensure unbiased and ethical procedures and practices are followed in a statutory-compliant manner (Falletta and Combs 2021). Thus, HRAPs must be mindful of grounding their analytics ethically and socially responsibly through appropriate research methods. Greasley and Thomas (2020) pointed out a situation of some ambiguity that HRAP may face wherein they may see analytical projects as an opportunity to promote the analytical credentials of the HR function through numerical data. On the contrary, managers or even HR professionals may treat the numbers with scepticism (Angrave et al. 2016). Researchers have cautioned HRAPs when leaning towards quantitative data and exclude qualitative research in their analytical projects (Guest 2011; Harley 2015). While doing so, extant literature suggests having a variety of evidence types to understand experiential and behavioural aspects of humans, which sometimes are difficult to define and measure (Purcell 2014), and have called for a qualitative form of data that can help to explain rather than measure only (Morrell and Learmonth 2015), as subjective assessment is considered a crucial element of managers' professional reasoning (Hewison 2004).

Additionally, the awareness of the HRA practice and its efficacy in addressing organisational issues and problems is low. This lack of awareness suggests more work needs to be done by HRAP cross-functionally to recognise the value of HRA as a function and then propel their constituencies in the organisations to use data insights when making decisions (Ulrich and Dulebohn 2015; Angrave et al. 2016).

Some researchers further suggest that HRAPs reach out to external stakeholders, such as investors, by adopting the language of risk and opportunities to help them appreciate the function’s value in helping organisations achieve their strategic agendas (Rasmussen and Ulrich 2015).

To help build the function's efficacy, HRAP must align their efforts to deliver sustainable value by providing suitable forms of knowledge in the wake of the emergence of evidence-based HR practices (Pfeffer and Sutton 2006; Rousseau and Barends 2011) and the increasing trend of data-based decision-making in HR (Harley 2015). For example, the recent CIPD Profession Map recommends evidence-based practice in HR and suggests using scientific research findings and organisational data as an outcome of HRA through professional experience, judgement, and stakeholder values/concerns (CIPD 2018). The HRAPs need to pragmatically align themselves to these emerging requirements (as highlighted above) by reflexively understanding the contextually situated nature of their role with a greater awareness of onto-epistemological and political implications as part of the production, dissemination and use of HR data (Greasley and Thomas 2020).

2.6 Summary and Conclusion

The review concludes with two contrasting perspectives on the HRA role. On the one hand, the role of HRAPs is poised to continue to gain practitioners' attention due to its potential to offer the HR function an opportunity to bring more rigour and objectivity to decision-making. There is growing recognition of the need to take advantage of data availability and the outburst of technological advancement in data analytics to better manage and develop employees for their effective utilisation in the business. At the same time, the literature points towards the challenge of extracting the true value of HRA and its trustworthiness, highlighting the importance of the role of HARPs.

On the other hand, despite this strategic importance, the role remains largely deprived of empirical attention by academic researchers. It is still far from a definitive resolution to its analytical and interpretative challenges. Empirical studies have focused mainly on identifying behaviours/competencies and do not demonstrate how these competencies can be put into action. Practitioner literature has also been more promotional and descriptive regarding the HRAP role, with little attention to how a role is executed in practice. Most research has viewed the HRAP's role in a socially decontextualised manner, working with analytical technologies and statistical tools. It has paid less attention to the interpretative aspects underpinned by discursive and cognitive activities inherent to the analytics process. As a result, these studies have only partially helped understand how HRAPs deploy their abilities/skills/competencies while executing their roles.

The thesis argues that research on how HRAPs perform their roles needs to extend to include cognitive and discursive perspectives. There must be flexible ways of establishing what data to look at in a given context, how to engage with stakeholders, interpret the data, and communicate. While doing so, HRAPs are expected to perform agilely to meet the evolving needs of the role, which requires both deep technical knowledge and the ability to collaborate in a multidisciplinary analytical context. In this regard, sensemaking and sensegiving literature provide a useful lens for studying the HRAP's role involving ongoing alterations in a highly exploratory and explanatory experience amid complexity. The widespread application of the holistic and overarching theoretical lens of sensemaking and sensegiving can offer insight into how the role is executed in practice. Consequently, the theoretical platforms of sensemaking and sensegiving are reviewed in the next chapter.

Chapter 3 Literature Review of Sensemaking and Sensegiving

3.1 Introduction

This chapter examines the literature on sensemaking and sensegiving to set the theoretical foundation to explore the role of HRAP. After giving a historical context and origin of sensemaking and its application in an organisational context, the review examines three stages, i.e., noticing, interpretation and enactment, which are reviewed in the light of tension and divisions in the literature regarding their distinction and sequence when making sense due to their importance when dissecting sensemaking patterns. The review presents a detailed account of two prevailing perspectives in the literature on how sensemaking is accomplished: (a) sensemaking through cognitive practices and (b) sensemaking through discursive practices. From a cognitive perspective, the review examines interpretative frames for their utility in making sense through noticing cues and subsequent interpretation.

As the HRAP role involves making sense and giving sense to the required constituencies, the review examines sensegiving literature in the light of external communicative action. When examining sensegiving, storytelling has also been reviewed as a sensegiving device to help shape the sensemaking processes of others towards some intended reality. As data analytics is a complex cognitive activity that relies heavily on external cognitive tools in the form of TTAs, the unit of analysis has been extended to include their interaction in shaping and altering HRAPs' sensemaking and sensegiving. The review also includes a detailed account of reflection and reflexivity when making and giving sense. In addition to examining the role of reflection, the review brings reflexivity to the forefront and argues for its relevance when examining the sensemaking and sensegiving of HRAPs, allowing them to question their ways of making and giving sense.

3.2 Sensemaking in an Organisational Context

Since the publication of Weick’s influential work (Weick 1995; Weick et al. 2005), sensemaking has enjoyed immense attention from researchers interested in studying how practitioners comprehend and take actions to lessen equivocality when faced with different situations and events in organisations (Holt and Cornelissen 2014; Maitlis and Christianson 2014; Brown et al. 2015; Sandberg and Tsoukas 2015; Introna 2019; Sandberg and Tsoukas 2020). Many researchers have examined sensemaking in terms of what it accomplishes in organisation processes (Maitlis and Christianson 2014) as it provides an opportunity to examine how practitioners make sense in organisations in response to particular situations and events (Sandberg and Tsoukas 2015). Studies on sensemaking have examined a range of situations in which organisation members experience a breach of expectations or come across an ambiguous event or problem inside or outside their organisation that somehow surprises, complicates, or confuses them and is significant to them (Maitlis and Christianson 2014; Brown et al. 2015).

According to Brown et al. (2015), sensemaking research is entrenched in many diverse fields of psychology. From this broad and diverse backdrop, the literature offers a variety of ways in which sensemaking happens in the organisation: language (O'Leary and Chia 2007; Cornelissen et al. 2008; Cornelissen et al. 2012), narratives (Boudes and Laroche 2009; Sonenshein 2010), discursive practices (Rouleau and Balogun 2011), mental frameworks (Bingham and Kahl 2013; Combe and Carrington 2015), temporal practices (Kaplan and Orlikowski 2013; Patriotta and Gruber 2015), embodied sensemaking (Cunliffe and Coupland 2012; Yakhlef and Essén 2013) and material practices (Stigliani and Ravasi 2012; Hultin and Mähring 2017).

The extant literature suggests that research on sensemaking has broadened its application in diverse contexts such as power and politics (Hope 2010; Balogun et al. 2014; Whittle et al. 2015; Schildt et al. 2020), organisation change and restructuring (Balogun and Johnson 2005; Lüscher and Lewis 2008), during crises

(Combe and Carrington 2015; Berthod and Müller-Seitz 2018), counter-terrorism (Colville et al. 2013) material landscape and ecological processes (Whiteman and Cooper 2011), and learning (Colville et al. 2014; Dwyer and Hardy 2016). This application of sensemaking in a variety of contexts and the form further suggests that it is a variable phenomenon prompted by organisational activity disruptions that force actors to actively look for ways to resume the halted activity (Sandberg and Tsoukas 2015; Guiette and Vandenbempt 2016; Schildt et al. 2020). Frequently, this entails a challenge to routines and responsibilities that are taken for granted, leading actors to doubt basic presumptions about how to respond (Cornelissen 2012).

Despite its more comprehensive application, there is substantial variation in the conceptualisation and understanding of sensemaking. Some scholars have called it sensemaking theory (Jensen et al. 2009; Holt and Cornelissen 2014). Others have referred to sensemaking as a perspective (Weick 1995; Brown et al. 2015), as a lens (Sonenshein 2009; Vough 2012) and as a process (Sonenshein 2010; Cornelissen 2012; Maitlis and Christianson 2014), a recurring cycle or something that reveals itself as a cycle (Weick et al. 2005). Maitlis and Christianson (2014: 67) defines sensemaking as "a process, prompted by violated expectations, that involves attending to and bracketing cues in the environment, creating intersubjective meaning through cycles of interpretation and action, and thereby enacting a more ordered environment from which further cues can be drawn". Sensemaking is about classifying and compartmentalising experience to stabilise it (Weick et al. 2005). While presenting its features, Weick (1995) has characterised sensemaking as a retrospective, continuous, and social process that involves identity, cues extraction, and enactment. According to Cornelissen (2012), in an organisation setting, sensemaking is a meaning-construction process wherein organisation actors interpret events and issues that are complicated, unexpected and puzzling for them within and outside their organisation.

3.3 Sensemaking as a Dynamic and Continuous Process

Literature views sensemaking as a dynamic, continuous and repetitive process that may or may not unfold in a sequence to create meaning (Weick 1995; Weick et al. 2005). Sensemaking happens through a specific process in which actors are engaged to make sense of any event or situation through their lived experience (Maitlis and Christianson 2014; Sandberg and Tsoukas 2015). For example, Weick (1995) argues that sensemaking includes noticing and bracketing interpreted cues and revising those understandings based on actions and their outcomes. In other words, actors first notice cues for their subsequent interpretation and then act on these interpretations in an ongoing cycle (Maitlis and Christianson 2014). In their comprehensive review of sensemaking research, Sandberg and Tsoukas (2015) conclude that most sensemaking studies do not clearly distinguish these three processes. These divisions, tensions, disagreements and variances in the literature on the sensemaking process are primarily due to increased diversity in the approaches to studying sensemaking (Brown et al. 2015). The sensemaking process is depicted in Figure 3.1 and discussed below in detail.

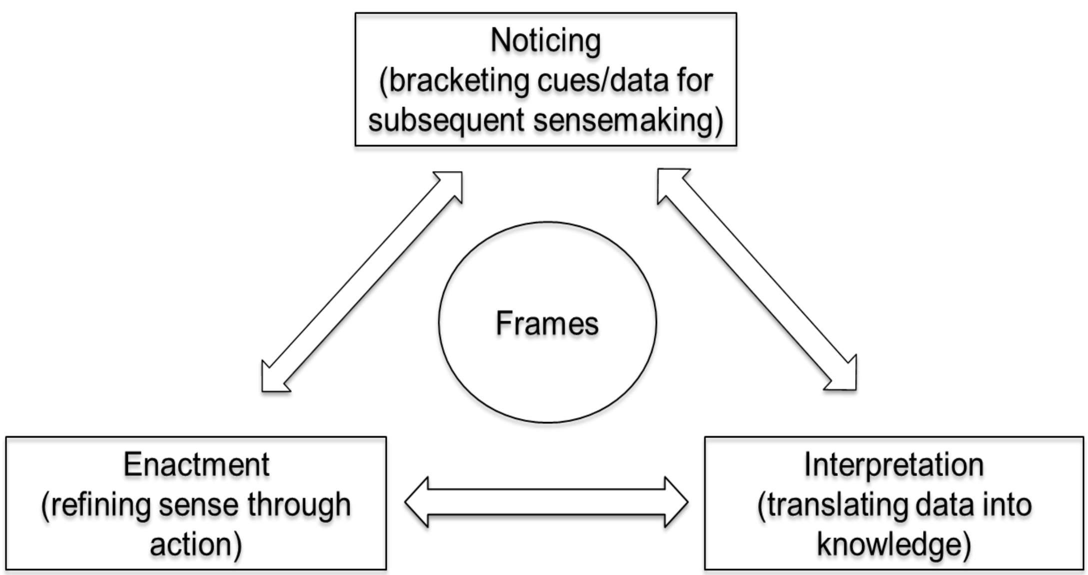


Figure 3-1: Sensemaking Cycle, Adapted from Weick et al. (2005)

3.3.1 Noticing

Sensemaking starts with individuals noticing and bracketing the environmental cues regarding ambiguous events or situations for which the meaning and/or the outcomes are uncertain (Weick et al. 2005). In organisational sensemaking, noticing is an attentional process through which actors extract cues from some portion or complete experience in confronted situations/events for further interpretation (Weick 1995). Noticing involves information gathering or cues extraction, usually considered an originator to subsequent explanation and action (Thomas et al. 1993). During noticing, actors single out some problematic stimuli as cue/s for further deliberate processing from their experience (Jeong and Brower 2008). According to Louis and Sutton (1991), noticing is an iterative process in which actors move from automatic to active thinking by identifying inconsistencies that interrupt or disrupt their enduring understandings.

When noticed, such cues are triggered by unexpected changes/other surprises or a deliberate attempt to seek comprehension that makes an individual doubt their prior understanding (Maitlis and Christianson 2014). To make sense of a situation, people must first notice it as it interrupts their ongoing flow, disrupting their understanding of reality and resulting in uncertainty or lack of clarity about how to act or respond to it (Weick 1995). What does not get noticed is not available for (further) sensemaking (Starbuck and Milliken 2006). In other words, noticing is an embryonic state of sensemaking (Weick et al. 2005). This process of extracting cues and noticing from organisation actors' lived experiences has also been called creation – producing an initial sense of the disrupted situation for further sensemaking (Weick 1995).

Organisation actors notice environmental cues by deploying skills such as seeing, smelling, hearing and feeling (Starbuck and Milliken 2006). The act of noticing to extract cues for subsequent sensemaking is an interface of stimuli with the individual (Starbuck et al. 2006). Through noticing, the sensemaking process focuses on some aspects of extracted cues while completely ignoring others (Weick 1995; Weick et al. 2005). The nature of noticing is binary, either yes or no, as it is through noticing that individuals consider responding to events, thereby trigging sensemaking, and, in situations where events or cues are not noticed, they are not available for sensemaking (Starbuck and Milliken 2006). When determining what should be grouped and given more attention, actors search for cues based on the importance they assign them based on their mental frameworks. (Holt and Cornelissen 2014). These frames guide noticing, characterised by strengthening specific stimuli and weakening others, driven by sensitivity to stimuli depending on familiarity as it can drive sensory function to notice subtle cues and changes in those cues (Starbuck and Milliken 2006). Similarly, organisation actors fail to notice that they have failed to notice due to their frames not picking up what they did not notice (Mangham and Pye 1991).

Actors' ability to notice cues from the organisational context is restricted by their cognitive capacities and the nature of cues and situational factors (Starbuck and Milliken 2006). Due to cognitive limitation, organisation actors can notice only a selected portion of the cues and tend to ignore the cues that do not conform to their initial set of mental frames to maintain consistency in their sensemaking (Maitlis and Sonenshein 2010; Colville et al. 2013). The actors' inability to register the cues can be traced to problems with stimuli (cues) and problems with actors (Starbuck et al. 2006). The first category of problems is related to the nature of cues (Starbuck et al. 2006), as actors are inclined to notice frame-coherent cues and tend to miss inconsistent or highly surprising cues because these escape their mental frames (Kiesler and Sproull 1982). The second problem category is related to the actors' individual beliefs, blind spots, and other personal biases. For example, Starbuck et al. (2006) argue that actors tend to focus more on cues perceived as having immediate rather than long-term relevance to them. Actors usually do so when dealing with conflicting information and fluctuating stakeholder interests under time constraints and resource limitations (Mann and Tan 1993).

The information gathering as part of the noticing process also operates through the purpose and goal of the actors. The actors may look for specific information with a clear intent in mind, or, on the other hand, they may like to browse through information without a particular matter to resolve (Vandenbosch and Huff 1997). Since mental frames are developed and learned through actors' career history (Porac and Thomas 2002), their background and experience are likely to influence their scanning of the business context for cues extraction (Vandenbosch and Huff 1997; Sutcliffe and Huber 1998).

3.3.2 Interpretation

Organisation members translate data/cues into knowledge and seek understanding about the situation/task through interpretation, i.e., information-processing activity (Weick 2001). Interpretation is a widely focused aspect of the sensemaking process (Balogun and Johnson 2004; Lüscher and Lewis 2008; Sandberg and Tsoukas 2015), which involves refining the initial sense acquired through noticing the initial cues in order to develop an improved sense of the situation at hand (Sandberg and Tsoukas 2015). In other words, through interpretation, an individual actively seeks to understand and comprehend the cues noticed (Jeong and Brower 2008). This understanding is formed by connecting cues to the reference or interpretative frames (Weick 1995). Organisation actors interpret various issues and situations by assessing them in relation to the categories of their cognitive frames and attaching labels to information to comprehend and assign meaning (Holt and Cornelissen 2014; Sandberg and Tsoukas 2015). Sometimes, the interpretation is also involved in inventing new meaning when initial cues observed do not serve the purpose of subsequent clarification of the initial sense gained, and the situation demands an entirely new sense (Weick et al. 2005).

It is essential to distinguish sensemaking from interpretation, although they are often treated as synonymous (Maitlis and Christianson 2014). Sensemaking deals with how people create what they interpret, whereas interpretation is about connecting the new cue to the existing frames (Sandberg and Tsoukas 2015). When there is no apparent link between cues and frames and a need for this lost connection, sensemaking gets warranted (Weick 1995; Weick et al. 2005). Interpretation based on frames allows actors to interpret observed cues quickly and efficiently by matching cues to salient features of a frame. When there is a reasonable resemblance between observed cues and available frames, the cues can be interpreted readily without additional observation or cognitive effort (Grolemund and Wickham 2014).

When there are difficulties matching the observed cue's characteristics with available frames, it may activate additional information gathering, revision of current frames, or attribution processes that can assist in sensemaking (Klein et al. 2007). Alongside updating frames or looking for more data, there can be a situation where schema or data is made redundant for that particular sensemaking task due to the mismatch in observed cues and frames (Grolemund and Wickham 2014). This phenomenon of accepting or rejecting/doubting one’s frame and moving to another has been described as honouring or rejecting the past through adjusting sensemaking (Weick et al. 2005).

In their extensive review of the sensemaking research, Sandberg and Tsoukas (2015) observed no apparent difference between the sensemaking and interpretation process, thereby rendering sensemaking as mere interpretation despite Weick's constant claim that sensemaking and interpretation are not identical (Weick 1995). For example, Balogun and Johnson (2004) studied the interpretative schemata of middle managers before and during major organisational restructuring based on the premise that sensemaking is about restoring cognitive order through interpretative schemas. Lüscher and Lewis (2008) study of organisational change at the Danish Lego Company also adopted an interpretative stance on managerial sensemaking while working through paradox.

On a similar note, Whittle et al. (2015) also examined how actors make sense of formal organisational schematics in organisational structure, job descriptions and other plans through interpretive categorisation practices. They introduced breaking the existing frames and rebuilding the new frames for interpreting the organisational structure. Owing to this increased tendency to treat interpretation as sensemaking, Maitlis and Christianson (2014) argued that interpretation is an essential component of the sensemaking process but is not perceived as a sensemaking process itself.

Literature provides substantial evidence that interpretation patterns and subsequent actions are likely to be influenced by retrospective and prospective interpretation through temporal modalities (Gephart et al. 2010; Wiebe 2010; Sandberg and Tsoukas 2015; Introna 2019). According to Berends and Antonacopoulou (2014: 439), temporal modalities are “inner time”, specifically concerned with how an individual at any given moment relates his/her present to the past and the projected future, which means that there is a “threefold present”. Temporality deals with past, present and future dimensions, which coexist when practitioners act (Heidegger 2008; Schatzki 2012). For example, organisation actors, while performing any activity, may be informed by earlier experiences, and their present experiences may be relevant and may inform but not impose future predictions through predictive analysis (Hydle 2015). They may face a situation where there can be multiple interpretations of the past due to varying experiences and contexts (Kaplan and Orlikowski 2013). As part of temporality, sensemaking is achieved through accessing and analysing the complete information; it is also about the coherence and acceptability of accounts that link future interpretations with past and present (Kaplan and Orlikowski 2013).

Literature offers two perspectives on temporality based on how it is conceptualised in various contexts. The first perspective is the future perfect tense (the Weickian perspective), in which actors imagine future images and then work backwards to interpret them (Comi and Whyte 2018). Based on this assumption, organisation actors, through the emerging process while focusing on the present context, develop an awareness of the past and future to perceive the unfolding of the future before it fully emerges (Tsoukas and Shepherd 2004; Costanzo and MacKay 2008). The core assumption behind future perfect thinking is to accept that actors cannot have actual knowledge of the future and what it holds, so they project the intended results as if they were already achieved and then reconstruct the paths that would have helped them to achieve such outcomes (Comi and Whyte 2018). Although future thoughts guide individual actions, they are derived from the past through retrospection and backward temporality (Weick et al. 2005). The second perspective labels sensemaking as present tense practice (post-weicking perspective) in which future images are built through present tense practices (Comi and Whyte 2018; Tapinos and Pyper 2018). The present tense perspective assumes that humans articulate the future while focusing on the present context to develop an awareness of the past and future to perceive the future unfolding before it fully emerges (Tsoukas and Shepherd 2004; Costanzo and MacKay 2008).

While studying temporality, it is vital to recognise that the divisibility of sense based on the past frames and present cues, which is the focus of the Weickian approach to studying sensemaking, has been challenged by Introna (2019). According to Introna (2019), the process of sensemaking is free of the temporal divide, and this connection of schemas/frames based on past to present through cues infers a prior disconnection, i.e. detachment of past and present, which needs to be restored in order to make sense through frames, categories, cues and labels. It seems acceptable to consider different time forms, such as clock and event time, as two distant temporalities for analytical purposes; however, these different forms of time cannot be distinguished in the blended flow of life as future possibilities are already inserting themselves in the present based on the past imposing itself into the present (Introna 2019).

The interpretation element in sensemaking is also called the production of plausible accounts (Weick 2012). In a given situation, plausibility has been defined as the perception that a certain meaning is more significant than others or that something feels right within the actor's range of potential meanings (Helms Mills et al. 2010). Plausibility rather than accuracy is the hallmark of the sensemaking process (Weick

1995; Weick et al. 2005; Ancona 2012; Munro and Huber 2012). Plausible accounts help take action and create further opportunities for refining the sense, and over time, actors equip themselves with supporting evidence to improve their actions (Sutcliffe 2000). At the same time, Weick et al. (2005) argue that organisation actors may label their sensemaking endeavours as the chase for accuracy to keep them motivated. However, they will never get the complete and accurate story.

There are instances where the sensemaking process has either covered or further reinforced poor decision-making through subsequent actions due to a sudden loss of structure in pursuit of sense during exceptional events and circumstances (Weick 1990; Weick 1993; Weick and Sutcliffe 2003). The established model of sensemaking in this situation calls for different or more structures for meanings (Weick et al. 2005). At the same time, Munro and Huber (2012) caution the reader that the pursuit of acquiring structure can lead to further loss of meaning and argue that this loss of sense could happen due to (a) one misinterpretation leading to others or (b) wrong maps or (c) a tendency towards plausibility in creating stories and myths and restricting further sensemaking.

3.3.3 Enactment/Action

The third element of sensemaking is about action individuals take to make and refine sense, which has also been widely referred to as enactment as actors enact the environment they seek to comprehend (Weick et al. 2005; Maitlis and Christianson 2014; Sandberg and Tsoukas 2015). During sensemaking, the reciprocal impact created between organisation actors' actions and the environment is called enactment (Orton 2000). Enactment distinguishes sensemaking from mere interpretation since actors significantly impact shaping the context in which they are placed (Weick et al. 2005). As Weick (1988) observes, organisation members, through their actions, often create structures, controls and opportunities that were not there before they took action.

According to Sandberg and Tsoukas (2015), Weick's view of enactment establishes sensemaking as a circle of forwarding action based on reflective pondering. It means that the outcome of an action is known only when the action has been completed, which means that humans are always behind or actions are always ahead (Weick 1995). Weick based his idea of sensemaking on the premise that organisation actors can only reach out to their world's reality through the lived experience of their actions (Sandberg and Tsoukas 2015). Enactment is also labelled as the process that produces knowledge through doing, i.e. pragmatism of sensemaking (Langenberg and Wesseling 2016).

Enactment occupies a central stage in sensemaking instead of merely a stage in the process (Stewart et al. 2011; Hutto et al. 2013; Sandberg and Tsoukas 2015). Action as part of enactment is not a separate and a later step in sensemaking; instead, it needs to be recognised as one more way of understanding reality to assign meaning (Weick et al. 2005). Action is one of the sensemaking tools that can refine the initial sense gained or even help to abandon the initial sense in favour of a new sense or meaning gained (Ancona 2012). Many researchers argue that sensemaking is a continuous process represented by repeated action – a meaning cycle in which actors act on initial understandings and then adjust their understanding (Colville et al. 2012; Maitlis and Christianson 2014). Human actions are driven by habits and identity, developed in the past without being completely aware of the meanings until actions taken have been responded to (Weick 1995; Weick 2009). The adjustment phenomenon of actions, initiated based on initial sense to obtain a more definite sense, is through interweaving sense and action rather than treating them as separate (Sandberg and Tsoukas 2015).

According to Sandberg and Tsoukas (2015), researchers seem to lack clarity on enactment and whether it is an activity that confines one sensemaking process. Alternatively, enactment is carried out in all three processes, i.e. noticing when the initial sense is made, interpretation when refinement of sense takes place or in the enactment process itself when action is taken based on the refined sense made during interpretation (Sandberg and Tsoukas 2015). This lack of clarity also fuels the confusion around the relationship between sense and action; if sense is separated from action and noticing from interpretation, then the holistic nature of sensemaking is potentially at risk (Sandberg and Tsoukas 2015).

In other words, sense and action are interlinked as organisation members create sense by acting their way into the sense (Weick 2009). This confusion around enactment arises partly from the argument that sense and action are two different elements, and sensemaking is about their interaction (Christianson et al. 2009; Sandberg and Tsoukas 2015). On the other hand, sense and action are considered inseparably intertwined (Barad 2007) and tied together (Shotter 2013). In other words, there is a circular relationship between sense and action as sense and action do not interact; instead, they intra-act in a broader flow (Sandberg and Tsoukas 2015). According to Sandberg and Tsoukas (2011), this rotary relationship between sense and action in enactment emphasises the intertwined mode of human existence in a sociomaterial world.

3.4 Cognitive and Discursive Perspectives on Sensemaking

The variation in views on sensemaking may be partly attributed to diversity in approaches towards how the actors enact it and the theoretical approach adopted to study it (Sandberg and Tsoukas 2020). Several reviews have shown that the two dominant theoretical lenses are used to study sensemaking, i.e., cognitivism and linguistics (Maitlis and Christianson 2014; Brown et al. 2015; Sandberg and Tsoukas 2015; Sandberg and Tsoukas 2020). From the cognitive perspective, sensemaking is interpreting cues through constructing cognitive frames and mental frameworks (Weick 1995; Elsbach et al. 2005). From a linguistic perspective, sensemaking is a social process of constructing sense mediated by language through which organisation actors understand, interpret, and create meaning for themselves (Balogun and Johnson 2004; Brown et al. 2008; Maitlis and Sonenshein 2010; Rouleau and Balogun 2011).

3.4.1 Cognitive Lens on Sensemaking

From a cognitive perspective, sensemaking is an activity in an individual head that focuses on the mental frameworks, schemas or frames to connect with noticed cues to derive meaning (Fiss and Zajac 2006; Maitlis and Sonenshein 2010; Bingham and Kahl 2013). This research stream focuses on cognition and how individuals interpret and respond to situations when making sense (Maitlis and Christianson 2014). At the individual level, sensemaking is a cognitive feat encompassing seeking through the body of data for relationships and making them recognisable for self and others (Klein et al. 2006; Grolemund and Wickham 2014). More specifically, cognitive frameworks (general or specific) influence what cues individuals notice, extract from the various data sources and collate to create a more coherent meaning of the reality and act (Weick et al. 2005).

Researchers have acknowledged that human information processing and interpretation capabilities from a cognitive perspective are limited (Fiske et al. 1991; Chia and Holt 2009) and vary from one person or organisation to another (Sutcliffe 1994). Instead of attempting to comprehend all the information that humans come across, they represent reality through mental models in the form of a simplified version, commonly referred to as knowledge structures (Walsh 1995), cause maps (Weick 1995), frames (Kaplan 2008) and schemas (Bingham and Kahl 2013; Steinbauer et al. 2015). All these cognitive concepts of knowledge structures, cause maps and schemas have been interchangeably used and share definitional underpinnings with frames that occupy a central place in sensemaking (Weick 1995).

During sensemaking, frames are frequently called upon to refer to categories of experiences; through these frames, cues are bracketed for closer attention and are interpreted (Holt and Cornelissen 2014; Konlechner et al. 2018). Frames are units or clusters of organised knowledge structures stored in human memory gained from past incidents and experiences, allowing them to accommodate and process various solutions (Nadkarni and Narayanan 2007). Frames are differentiated by categorisations, or labelling features, developed from perceived similarities and contrasts (Porac and Thomas 1990). According to Weick (1995), frames are past instants of socialisation, cues are present moments of experience, and meaning is constructed by creating a relationship between these two moments. From a cognitive perspective, how actors make sense of ongoing situations relies on the relationship between frames and cues (Maitlis and Sonenshein 2010; Colville et al. 2012; Werner and Cornelissen 2014). Placing cues into a frame provides an orientation that enables organisational actors to understand, rationalise, assign, infer and foresee (Starbuck and Milliken 1988). Frames bring experience into memory (Bruner 1990), offer the holding mechanism for past learning (Colville et al. 2014) and serve as interpretation filters (Weick 1995).

According to Maitlis and Sonenshein (2010), creating plausible meaning depends on noticing and interpreting environmental cues through frames. Sensemaking can be engaged in the quest for plausibility at various stages of an unfolding experience (Weick et al. 2005). Actors usually first evaluate the significance of cues in the context of frames, which could cause them to discount certain cues. They then come across other cues frequently produced by their actions (and inactions), encouraging them to search for additional cues (Weick 1993). Additionally, research indicates that past frames frequently inhibit actors from viewing reality from other perspectives, preventing them from switching their perspective/s (Holt and Cornelissen 2014). When complexity grows, the conceptual frameworks of previously organized experience tend to prevent actors from seeing the specificity of the changes in the current experience (Colville et al. 2016).

3.4.2 Discursive Lens on Sensemaking

Language has been cited as one of the most prominent sensemaking tools when organisational members are confronted with equivocal situations/events to define or create meaning and serve as a catalyst for subsequent action (Weick 1995; Cornelissen et al. 2012; Maitlis and Christianson 2014; Sandberg and Tsoukas 2020). For practitioners, acting in the world involves using language and reflecting on how they engage with their practice to make sense of it (Bosma et al. 2016). The linguistic perspective on sensemaking is in sync with a metaphorical question, "how can I know what I think until I see what I say?'' (Weick 1995: 18). Furthermore, the linguistic viewpoint is endorsed by the notion that sensemaking is about turning events/issues into a condition explained in words (Taylor and Van Every 2000).

From a linguistic perspective, sensemaking is entrenched in discourses perceived as relatively stable meaning-making tools and can influence and create the possibilities of making sense (Helms Mills et al. 2010). In organisation settings, established discourses are considered ready-made interpretative repertoires in words, categories and other components put into practice through the language in social practice (Brown et al. 2015; Sandberg and Tsoukas 2020). Domain-specific discourses, e.g., professional and vocational expertise (Lockett et al. 2014), institutional logic (Nigam and Ocasio 2010) and managerial knowledge (Rouleau 2005), in particular, become salient tools and resources for practitioners to formulate and assess their understandings of the reality (Mantere and Vaara 2008), thus converting an unequivocal situation into an equivocal one (Sandberg and Tsoukas 2020).

A body of research emphasises the situated nature of discursive practices for meaning construction in organisations. For instance, Rouleau (2005) analysis of sensemaking micro-practices reveals how actors continuously and sometimes unconsciously adapt their discursive practices as part of their daily conversations so that their interpretations of change resound with their team members and suit the evolving context. Similarly, Rouleau and Balogun (2011) identified and explored the middle manager's ability to understand and shape the sociocultural context using appropriate language while interacting with stakeholders. Sense is thus made and given to others through a situated awareness of language use and its application (Rouleau and Balogun 2011). These studies have spurred further research that emphasises discourse's importance in acts of interpretation and meaning creation (Cornelissen et al. 2008; Fenton and Langley 2011). Bolander and Sandberg (2013) emphasise that sensemaking is about creating a practical reality in which action and context are reciprocally constructive elements during employee selection. Lunkka et al. (2019) investigated how project participants, as situated reflexive practitioners, make sense of their lived experiences by practising a discursive repertoire in project management.

3.5 Sensegiving and its Application in an Organisational Context

Sensegiving is "the process of attempting to influence the sensemaking and meaning construction of others toward a preferred redefinition of organisational reality" (Gioia and Chittipeddi 1991: 442). In other words, sensegiving is an attempt to influence the sensemaking of others in a particular way (Maitlis 2005). On a similar note, Weick et al. (2005) have described sensegiving as a sensemaking variant to produce meanings for others, which is impossible without making sense in the first place (Bosma et al. 2016). Sensemaking involves how practitioners make sense for themselves, whereas sensegiving is concerned with their attempts to influence the outcome of others' sensemaking and often gain support for their version of reality (Gioia and Chittipeddi 1991; Weick et al. 2005; Maitlis and Lawrence 2007). The nature of the relationship between sensemaking and sensegiving is such that these processes permeate each other's boundaries, as one implies the other and cannot exist without the other while appearing conceptually different (Rouleau 2005).

The term sensegiving is typically employed when the attention is on the actor's external communicative action in the organisation. Sensegiving is a term utilised to study people's outward informative organisation (Gioia and Chittipeddi 1991; Gioia et al. 1994). The initial conceptualisation of sensegiving specifies it as a framing process (Gioia and Chittipeddi 1991), and other researchers have expanded the idea of sensegiving as framing (Fiss and Zajac 2006). Sensegiving is generally seen as an intentional attempt to influence others; this suggests that the sensegiver has a particular audience in mind when conveying a sense (Corvellec et al. 2007). While sensegiving has been recognised as a process to persuade others through intentional efforts towards the preferred definition of reality (Gioia and Chittipeddi 1991; Corvellec et al. 2007), there is no assurance that the intended sense will be received and adopted (Maitlis and Lawrence 2007; Hope 2010; Smerek 2011).

While putting into practice the linguistic and interpretative mechanisms, the research on sensegiving has also identified how managers/leaders capitalise on opportunities while shaping the meaning-making process through their sensegiving practices. Numerous studies have highlighted the importance of sensegiving when organisations are going through a change process due to actors' need to manage the complexities of change initiatives (Maitlis and Lawrence 2007). In this regard, sensegiving has primarily been explored regarding how managers/leaders shape the meaning-construction process of the targeted organisation members to pursue their objectives (Rouleau 2005; Hope 2010; Rouleau and Balogun 2011).

Managers/leaders give sense to their constituencies to make sense of others' reactions and interpretations and act accordingly (Sharma and Good 2013). In other words, sensegiving can become the springboard for further sensemaking (Foldy et al. 2008). Maitlis and Lawrence (2007) argue that the managers' sensegiving efforts are pretty volatile and are achieved through their discursive ability as a device or tool to create and communicate convincing accounts involving multiple participants. In the context of corporate social initiatives, Sharma and Good (2013) argue that middle managers can facilitate the divergent views of the stakeholders by engaging in sensegiving through situated discourses and designing structures concerning clear roles and timelines to achieve the stated goals.

Other research has focused on how organisational intervention's purpose and need/s influence and alter the content and form of sensegiving. For instance, in research regarding dispensing justice and understanding it in post-merger integrations, Monin et al. (2013) explain how sensegiving action generates three distinct types of impacts: sensebreaking (Maitlis and Lawrence 2007), sensehiding

(Vaara and Monin 2010) and sense-specification. Similar to this, Kraft et al. (2015) outline how leaders address employees' sensemaking needs through receptive, participatory, compensatory, and evaluative kinds of sensegiving associated with four distinct phases of change: exploration, preparation, implementation, and evaluation.

More specifically, Kraft et al. (2015) illustrate how specific sets of symbolic and discursive approaches are linked with respective sensegiving modes and work to construct a shared understanding of organisational change. Studies have also examined how sociocultural contexts influence actors' meaning construction within organisations (Rouleau 2005; Rouleau and Balogun 2011). For instance, Rouleau and Balogun (2011) show that middle managers' ability to give sense relies on their discursive abilities to draw on the context to set the scene and engage in conversations to influence stakeholder groups.

The common trend within sensegiving literature is the use and management of linguistic sensegiving devices to help shape the sensemaking processes of others towards some intended reality. Stories, as one of these devices, have gained prominence as a form of sensegiving and are perhaps best understood as recursive, mutual and interactional sensegiving mediums that help to shape the meaning of others (Maitlis 2005; Rhodes and Brown 2005; Weick et al. 2005; Ashforth et al. 2008).

3.5.1 Sensegiving and Storytelling

The conceptual and empirical literature also equates sensegiving with storytelling while focusing on the external communicative agency of the organisational actors (Gabriel 2000; Maitlis 2005; Maitlis and Lawrence 2007; Brown et al. 2009). Sensemaking and sensegiving involve storytelling, and storytelling implies sensemaking and sensegiving (Colville et al. 2012). As a preferred currency of sensemaking (Boje 1991), storytelling is essentially an act of framing that serves both interpretations (i.e., this is the meaning of the situation) and also serves as a frame for action in shaping others' sense (Rhodes and Brown 2005). The art of storytelling aids in interpreting, influencing, and persuading others of the sense presented; as a result, storytelling techniques aid in efforts to impart meaning. Since the dawn of time, stories have been used to transmit knowledge down the generations because they let people connect and communicate. According to Boje (2011), storytelling is a compelling way to represent and share explicit and tacit complex thoughts. For Weick (1995), a story can bring together distinct thoughts in a way that makes sense to others and motivates them to take action.

Narratives/stories have been widely studied in various organisational initiatives and processes (Boje 2008; Brown et al. 2009; Colville et al. 2012; Knaflic 2015; Dalpiaz and Di Stefano 2018; Dawson and Sykes 2018). For instance, Dunford and Jones (2000) draw attention to senior managers' sensegiving through narratives about events around strategic change. Maitlis and Lawrence (2007) highlight how leaders and the team engage in sensegiving by drawing on their relevant knowledge and skills at the right time and place through sensible stories that lead others to listen and gain acceptability. Brown et al. (2009) use stories to analyse power and knowledge creation during change. Similarly, Sonenshein (2010) argues that organisational actors use narratives to influence others' understandings. As such, stories can promote organisational culture identification (Smith and Keyton 2001), help build vision (Boje 1995), support organisational change (Brown et al. 2005), drive organisational change through narrative engineering (Klein et al. 2007), and communicate corporate social responsibility activities (Hall et al. 2021).

Prior research has also provided insights into how and with what effects practitioners connote these ideas of connecting to the objective behind story formulation in a given context. For example, Boldosova (2019) suggested focusing on story-plot diversity, multi-perspective engagement of the audience, and internal collaboration when propagating deliberate stories to targeted employees during BD adoption. In contrast, Sonenshein (2010), on the other hand, discovered evidence of a further discursive strategy used by storytellers to shape employees' interpretations of the change that involved the deliberate fabrication of ambiguous narratives.

Literature has shown that data analytics practitioners used stories as a powerful abstraction tool to conceptualise the patterns emerging in the data and their relationship and context (Knaflic 2015). Pirolli and Card (2005) proposed mapping meaningful facts and insights into frames expressed in various forms, including stories, maps, organisational charts and scripts. Boudreau (2010) coined the term retooling HR to describe this framing to secure buy-in from the stakeholders. Boudreau and Jesuthasan (2011) have suggested using appropriate metaphors appropriate to the target audience when framing the analysis to help them understand and act accordingly. Besides this, from a communication perspective, storytelling can be described as an information compression practice to help an audience focus on what is most relevant and essential in a simple manner (Segel and Heer 2010; McKenna et al. 2017).

3.6 Sensemaking and Sensegiving – Material Perspective

Sensemaking and sensegiving research increasingly acknowledge that human actors are embedded in a sociomaterial ecosystem where there are more than human actors in making and giving the sense, as sense is always made and given simultaneously through the interaction of humans and non-human actors (Orlikowski and Scott 2008; Balogun et al. 2014; Sandberg and Tsoukas 2015; Introna 2019). The central assumption is that individuals act and interact in ways that make and give sense (Weick 1995). In other words, actors' actions and interactions constitute the sense made at any point through different forms of interaction with materials, which become the source of constraints and opportunities they encounter (Weick 1995). The extant literature suggests that the human cognitive operating system and discursive practices extend to structures and processes outside the mind and body and involve the sociomaterial world (Orlikowski 2007; Orlikowski and Scott 2008; Balogun et al. 2014; Hultin 2019).

While expanding further on the interactive engagement and relationship of human and material artefacts recently, there have been calls to approach sensemaking and sensegiving as a practice in which the material environment is integral (Holt and Cornelissen 2014; Maitlis and Christianson 2014; Sandberg and Tsoukas 2015).

3.6.1 Individual Sensemaking and Sensegiving through Tools, Technology and Artefacts

Practitioners today face many complex tasks, with data analytics being one of them. These complex tasks pose several cognitive (e.g., information overload) and social (managing multiple stakeholders) challenges for practitioners. The human mind has evolved to rely on the external system of information-processing tools to augment human cognition (e.g., tools, artefacts, software systems and specific algorithms) that have some stability across contexts and time while performing various tasks (Berthod and Müller-Seitz 2018; Lehrer et al. 2018). Researchers have emphasised that the use of various TTAs changes the nature of the tasks and activities that a person performs instead of just amplifying the person’s abilities, and thereby enhances the overall performance of the integrated system that is composed of the person and the TTAs (Stigliani and Ravasi 2012; Demir 2015; Jarzabkowski and Kaplan 2015; Lehrer et al. 2018). Complex tasks such as data analytics rely heavily on the support of TTAs, and analysts are expected to process information from both internal (cognitive) and external representations (TTAs) interactively and dynamically. Instead of complete control, coordination is vital to this dynamic, reciprocal and harmonious interaction with the TTAs (Hutchins 1995; Stigliani and Ravasi 2012).

This social and material perspective in sensemaking and sensegiving has led scholars to hypothesise that the unit of analysis needs to be widened to include these TTAs (Shotter 2013; Berthod and Müller-Seitz 2018) and their interactions with humans (Eppler and Platts 2009; Parson and Sedig 2014; Mirkovski et al. 2019). From a practice perspective, TTAs are not perceived as simply things that an actor employs; instead, actors perceive them as situated TTAs that gain purpose within the context of use (Jarzabkowski 2005). It is important to note that TTAs may have continuously changing properties, acquire new materiality during their use, and give situated meaning once put into practice as part of the unfolding process of expert work (Jarzabkowski et al. 2013). Also, it is important to recognise that sometimes multiple TTAs are nested and entwined to execute work, e.g., rough sketches are used for representations, such as architectural drawings, together with digital designs during construction (Ewenstein and Whyte 2009).

Studies on sensemaking and sensegiving have picked up on the trend mentioned above and begun to conceptualise the use of TTAs in various organisation activities as the sensemaking and sensegiving practice unfolded to augment and support the construction and communication of meanings (Heracleous and Jacobs 2008; Korica and Molloy 2010; Kaplan 2011). For example, Stigliani and Ravasi (2012) showed how material artefacts extend the capacity of individuals to process information through cognitive supporting practices of storage and retrieval and integration of mental structures and categorisation of experience. Oborn et al. (2013) demonstrated how Information technology and other artefacts could be helpful sensemaking tools to support the development of meaning.

Similarly, when it comes to future sensemaking, studies have suggested that individuals use various types of artefacts to augment their ability to construct new understandings of the future (Heracleous and Jacobs 2008; Kaplan 2011). Finally, sensemaking through material artefacts is evident through material-discursive practices in the studies carried out in a hospital emergency department (Hultin and Mähring 2017). From a sensegiving perspective, Kaplan (2011) has shown how PowerPoint enabled the meaning through negotiation, shaping the outcome of investment decisions through discursive practices across multiple actors when making strategy.

When viewing sensemaking from a human-centric perspective, it is imperative to highlight the role of actors who use TTAs. In this regard, a practice lens draws attention to what actors do and emphasises that people put technologies into practice in multiple ways (Boudreau and Ramstad 2005). After collecting the necessary information, actors form an expectation/s of using TTAs. From this view, while TTAs are accessible, actors make strategic choices based on their interpretations as part of their practices (Lehrer et al. 2018). The nature and form of the TTAs continuously unfold according to their situated use and shape the activity and actor's sense (Gherardi 2010). For example, an Excel spreadsheet is not an innate tool but becomes a meaningful tool within the context of its analytical work. This means the tool may not have a single property and utility to which it can be put into use, and the tool affordance attracts types of materiality in the process of use.

3.6.2 Affordance

The extant literature suggests that the entanglement of humans with TTAs can be approached by different routes that emphasise the interpretive nature of human agency or those factors that render that agency possible in the first place (Faraj and Azad 2012). In the former case, the actor agency tends to remain the original explanatory medium for the constitution of sensemaking and sensegiving, as it is through human agency that material conditions are appropriated to comprehend the situation (Leonardi 2013). In the latter case, materiality, technology and agency are not treated as external causes of one another. Instead, they entangle in a binding set of iterative or recursive relations that leaves human agency as one more factor among multiple factors instead of being at centre stage (Leonardi 2013).

In order to help understand human material entanglement, the literature draws attention to the concept of affordance (Chemero 2003; Lehrer et al. 2018; Dremel et al. 2020) to help explain human and material engagement while undertaking various tasks using TTAs. Gibson (1986) first coined affordance to explain humans' behaviour when interacting with a physical object because of its value in the specific context. The study regards affordance as action/s possibilities perceived, stemming from the features of TTAs at the disposal of analysts (Leonardi 2011; Leonardi and Northwestern 2013; Fayard and Weeks 2014). As part of sensemaking and sensegiving, when organisation actors act on these action possibilities, they also become enacted through some interactive features of TTAs in action (Comi and Whyte 2018). TTAs also act upon the actors' mental representation of reality, leading to actions that generate further insights, produce further actions, and so on (Parson and Sedig 2014; Berthod and Müller-Seitz 2018; Kirk 2019).

Recently, affordance has gained renewed attention in sociomaterial and Information System research to theorise about the action possibilities of various TTAs' material features (Lehrer et al. 2018; Dremel et al. 2020). The perception of a human is a prerequisite for any affordance (Gibson 1986; Chemero 2003). Affordances are viewed from the perspective of opportunities perceived for action rather than the TTAs' properties (Faraj and Azad 2012). More specifically, affordances are viewed from the relation between a particular feature and the actor's specific abilities or circumstances. This indicates that TTAs can provide a variety of action options dependent on the actor's skills based on their age, training, cognition, motivation, and competence. (Faraj and Azad 2012).

In this study, affordance is action possibilities stemming from the material properties of TTAs (Zammuto et al. 2007; Markus and Silver 2008). Affordance helps understand the action possibilities of practitioners when they use TTAs to make and give a sense of reality in the light of their goals for actions, which are influenced by a range of factors, including organisational context (Lehrer et al. 2018). Moreover, technology may constrain an actor's goal and thus may not allow actualising an affordance (Dremel et al. 2020). Affordances describe the action potential, so they must be enacted or actualised for observable outcomes (Leonardi 2011; Fayard and Weeks 2014).

The TTAs are bestowed with affordances that may facilitate or restrict a given action, such as forming a mutual understanding, incorporating different perspectives, or revealing interdependencies (Eppler and Platts 2009). The affordances shape the choices, applications, and results of TTAs in conjunction with actors' restricted rationality (Jarzabkowski and Kaplan 2015). These TTAs aid in and sustain the transition to a realistic course of action by enabling practitioners to create accurate representations (Ewenstein and Whyte 2009) and perform guided actions in pursuit of their goals. Affordance focuses on the behaviours and relations between TTAs (real and abstract things like the output of the information systems) and goal-oriented users (Leonardi and Northwestern 2013; Volkoff et al. 2013; Fayard and Weeks 2014; Lehrer et al. 2018). The relational character of affordance may change depending on its constraints, relationship with the actor and environment, whereas the material properties do not (Hutchby 2001; Chemero 2003).

Faraj and Azad (2012) further suggest that affordance is a multifaceted relational, contextually embedded and socially aware phenomenon not just based on a single feature, property or functionality of the TTAs or organisational actor. They argued that affordance is often realised through the enactment of several interactions defined by the actors’ actions, practice or routine and artefact material/functional bundle. Also, it is essential to note that these interactions' generative, emergent and situational nature potentially offers the actors multiple affordances of the same artefacts. The extant literature provides merit in viewing affordances as a relational phenomenon linking the capabilities afforded by TTAs' materiality when examining practitioners' sensemaking and sensegiving practices (Leonardi and Barley 2008; Markus and Silver 2008; Orlikowski and Scott 2008).

When actors and computational technologies reciprocally interact, changes in one cause changes in the other, i.e. the two entities are coupled (Leonardi and Northwestern 2013) and entangled (Orlikowski 2007). The performance of any complex cognitive activity is fundamentally impacted by the user's characteristics, computational technologies used, and the nature of their relationship (Berthod and Müller-Seitz 2018; Hultin 2019). When studying the HRAP role, all technologies can be understood as shifting, contingent and constructed in practice; the experience with these interactive computational tools is emergent and dynamic as users continually (re)construct the reality as they act in it (Schultze and Orlikowski 2010).

The relational notion also refers to enactment and draws attention to the view that the relationships and boundaries between people and technologies are not constant but represented in practice (Orlikowski 2007). The performativity perspective of enactment thus shifts the focus away from believing in the presence of independent objects with fixed or given characteristics and boundaries to the range of other things in performance, humans and technologies alike (Hultin and Mähring 2017). The focus is on practices that shape the actions of human actors within appropriate relational and situated boundaries (Schultze and Orlikowski 2010). It means the focus is not only on how humans use technologies to produce specific outcomes but also on how humans and technologies are interrelated and assembled in specific ways to produce consequences (Hultin and Mähring 2017; Hultin 2019). From a relational and affordance perspective, the attention is not primarily paid to actors' actions or intentions but also to what affords their actions and intentionality through various sensemaking and sensegiving practices (Barad 2007; Gergen and Gergen 2014).

3.7 Sensemaking and Sensegiving – Reflexive Lens

Many researchers have shown interest in exploring and understanding how organisational actors engage in reflexivity and reflection (Cunliffe 2002; Cunliffe and Easterby-Smith 2004; Boud et al. 2005) alongside considering as a method or tool for researchers (Alvesson et al. 2008; Alvesson and Sköldberg 2018). The opportunity to use reflexivity when making and giving sense through thoughtful actions to provide organisational actors with new reasoning and perspective has gained increased attention from researchers and practitioners (Strike and Rerup 2016; Schildt et al. 2020; Robert and Ola 2021). According to Cunliffe and Easterby-Smith (2004), there are certain assumptions about the organisational realities and the practice world when reflexivity is put into practice. First is the conception that there is an outside world or real experience that organisational actors can think over. Second, the organisational actors make sense of the outside world through conscious and logical thinking. Third is the notion that reflection is a cognitive activity under individual control. Reflexive sensemaking and sensegiving involve considering multiple alternative accounts that relate interpretation, power dynamics, relevant existing beliefs and future or past actions, allowing richer sensemaking and sensegiving (Schildt et al. 2020). Both sensemaking and sensegiving require an ability to hold a reflective/reflexive conversation in a given situation as actors can begin to see how they make sense of and construct their social and organisational experiences in practice (Cunliffe and Easterby-Smith 2004).

Christianson et al. (2009) provided an example of how a museum curator reframed a tragic incident as a chance to revitalize a railway museum by encouraging his team to consider and visualize their ideal museum and then work toward creating it. Hibbert and Cunliffe (2015) advocate for a reflexive moral practice where managers (and others) critically reflect on their activities to prevent immoral, outdated and inefficient practices. Strike and Rerup (2016) developed the notion of mediated sensemaking and highlighted how sensemaking processes could be manipulated, renewed and redirected through reflection. Reflexive leadership is also gaining popularity, whereby leaders should carefully analyze how they organize their work and apply those considerations together with other leadership techniques to improve workplace efficiency (Alvesson et al. 2016). Similarly, Cunliffe and Scaratti (2017) emphasise the value of the dialogical characteristic in sensegiving and sensemaking and suggest leaders should have formalised reflection while managing change.

3.7.1 Reflection to Reflexivity – Processing and Rationalities

Reflective thinking provides a framework for managers and others to learn from their experiences in a structured, logical and planned way (Cunliffe and Easterby-Smith 2004). More specifically, the literature has frequently drawn on the concept of reflection and granted it a unique role when individuals require high situational awareness and are engaged in comparison, contemplating options, taking diverse viewpoints and drawing conclusions (Schon 1983; Kolb 1984; Weick and Sutcliffe 2001; Vogus and Welbourne 2003; Levinthal and Rerup 2006). Reflection is practised retrospectively or during the moment, also described as online reflection (Pacanowsky 1995). Woolgar (1988: 22) defines reflection as "benign introspection" aimed at improving "the adequacy of the connection between [practitioners'] statements and the object of those statements." From a reflection point of view, sensemaking is a process of thinking through the situations and acting on the reflection (Cunliffe and Easterby-Smith 2004).

From the above perspective, reflection is an objective process within a subjective experience (Cunliffe 2002) in which information about the outside world is found, considered, and connected to new inputs (Burgoyne 1992). The reflection after an experience or during the experience is based on certain assumptions about knowledge and the practice itself (Cunliffe 2002; Cunliffe and Easterby-Smith 2004). Accordingly, reflection is viewed as a disembodied cognitive activity under individual conscious control working in an environment where a real experience is waiting to be exposed through precise explanations and categorisation rationally and logically (Cunliffe 2002; Cunliffe and Easterby-Smith 2004). This is not always the case in a business environment, as most of the experience is interactive, responsive, spontaneous and uncertain (Burgoyne 1992). For example, if Kolb (1984) learning model is put into practice to organise understanding of an experience, then events are placed within four stages and reflecting on them is treated as a cyclical process – when the situation probably did not occur this way. Conventional learning models treat reflection as an intellectual process inside the head in a disembodied manner where mind, body, intellect, emotions, thinking and acting are treated separately for a more objective, structural or ideological view (Fox 1997).

While departing from treating reflection as purely a cognitive and intellectual activity, others have taken social constructionist supposition as the sense of self and others is created not only through technical analysis of the situation or problem at hand but should also consider relational issues and other social and cultural dynamics at work (Cunliffe 2002; Reynolds and Vince 2016). The underlying philosophy of social constructionism is relational, meaning humans construct realities in their interactional moments with others (Weick 1995; Cunliffe 2002). Sensemaking is about making sense of the self and the situation socially (Shotter 1993). Therefore, separating practitioners from their actions, social interactions, and context is challenging because they always act within conditions and with others (Cunliffe and Easterby-Smith 2004).

Based on the relational approach, sensemaking and sensegiving becomes a dialogical process that involves ways of taking stock and manipulating experiences from within the experience itself (Shotter 1993) and becoming more aware of how to represent and maintain new realities and identities as opposed to unearthing only the existing realities (Cunliffe 2002). Sensemaking and sensegiving, from this perspective, constitute knowing from within, knowing how to relate to others as a person in a particular situation (Shotter 1993) through reflexivity as opposed to only an externally imposed system of abstract concepts, propositions or critique through reflection (Cunliffe 2002; Cunliffe and Easterby-Smith 2004). Reflexivity has been defined as “a turning back on oneself” (Lawson 1985: 9) to question the self as subject (Jun 1998), ramifying thinking or experience by revealing inconsistencies, doubts, dilemmas and opportunities (Chia 1996) and questioning tacit assumptions and ideologies (Cunliffe 2002). For practitioners, reflexivity is an ontological skill that includes acquiring individual responsiveness of knowing what to do in a socially constructed reality (Spinosa et al. 1997).

While extending the notion of reflexivity in organisational practice, Cunliffe and Easterby-Smith (2004) introduced the concept of ‘practical reflexivity’, which hinges on the critical stance to practice. According to Cunliffe and Easterby-Smith (2004), in practical reflexivity, practitioners critically review the self and their interaction in practice through non-structure, non-linear, embodied in and complicated processes. The notion of practical reflexivity extends sensemaking to an inside-out process where critique is situated in practice and the self and its interaction rather than concepts only through internal or external dialogue to make sense of experience (Watson 1994). From an inside-out perspective, practical reflexivity may offer an opportunity for practitioners to connect to their experience by questioning their ways of making sense of the data viewed to unearth the existing realities and construct and maintain their realities by exploring features from within experience (Cunliffe 2002).

Practical reflexivity situates knowledge as knowing from within, a practical grasp of the surroundings, and understanding how to relate and participate as circumstances unfold (Shotter 1993). Practical reflexivity is not a calculative or theoretical attempt to understand any phenomenon; instead, it is an endeavour to unearth the taken-for-granted aspect of experience by opening oneself to meanings and possibilities within (Cunliffe 2002). In other words, practical reflexivity empties the self of all preconceived notions and beliefs, opens the self to alternative frames and new possibilities, and becomes more abundant in contingencies (Cunliffe and Easterby-Smith 2004). It involves a reflexive tacit sense and more explicit sensemaking of the situations in which practitioners find themselves both during and after the practice as a retrospective questioning (Cunliffe and Easterby-Smith 2004).

Practical reflexivity means existential questioning (self rather than other), i.e., notions of being and acting in the world, which does not involve just learning theories and techniques but the essence of how we relate to others, both human and non-human elements such as TTAs and make sense (Cunliffe and Easterby-Smith 2004). While extending the concept of reflexivity to materiality, from a relational ontological perspective, Keevers and Treleaven (2011) argue that humans cannot logically separate themself from their words, actions and things around them, as they all are mutually constituted and intertwined in practice, so the detached approach from the outside approach of reflection is not feasible. According to Keevers and Treleaven (2011), from a material perspective, the attention of reflexivity gets shifted from thinking back on the constituents of practice (actors, experience, TTAs and activity) to enunciating the relationalities and patterns created by intra-actions through the diffraction practices. In other words, this means practitioners recognise and think critically about aspects of implicit knowing and acting through TTAs, heightening awareness and sensitivity to what is happening around them, exposing both spoken and unspoken assumptions (both inside and outside) and impacting the situation within our experience and triggering new ways in their practices (Cunliffe 2002).

3.8 Summary and Conclusion

This chapter reviewed sensemaking and sensegiving as a theoretical base for this study. As a meaning-making process, sensemaking offers a useful lens to dissect the interpretative patterns of HRAPs while performing data analytics in HR. The literature review highlights that sensemaking is a dynamic and continuous process in which action/enactment occupies a central position in the other two stages of sensemaking, i.e., noticing and interpretation. The literature review examines cognitive and discursive perspectives on sensemaking. While sensemaking is about meaning-making for self, sensegiving is concerned with making sense for others for a preferred definition of reality. The review considers sensemaking and sensegiving as complimenting processes when practitioners perform their practice.

In organisation practice, sensemaking and sensegiving are sociomaterial phenomena where actors perform complex tasks through material practices. Organisation actors deploy various TTAs to augment sensemaking and sensegiving in the repetitive and recursive modes. These TTAs are very much entangled, wherein the role of enactment gets extended through actors' affordance as a perceiving act and as a way of interacting with material practices in every stage of sensemaking and sensegiving. The review conceived reflexivity as an inside-out activity connecting to the sensemaking and sensegiving experience by questioning ways of making sense and then building a repertoire for the subsequent experience. Accordingly, reflexivity occupies a central place while making and giving sense, as the nature of the constructed explanations and accounts requires practitioners to question their engagement in their practices. The next chapter presents the conceptual framework and its development to help answer the research questions.

Chapter 4 Developing Human Resources Analytics Practitioners' Sensemaking and Sensegiving Framework

4.1 Introduction

In this chapter, the theoretical concepts of sensemaking and sensegiving reviewed in Chapter three are deliberated to develop a sensemaking and sensegiving framework (hereafter referred to as SSF), which will assist in exploring the HRAP's role. The SSF draws attention to constituents of HRAP's sensemaking and sensegiving in the context of HRA. The SSF helps attend to 'what' and 'how' details in unfolding the HRAP's sensemaking and sensegiving practices of contextualising and attributing meanings to the data and thereby unpack the constituents of the interplay of reflexivity with sensemaking and sensegiving. The SSF argues that when making sense, the sensemaking cycle of the noticing, interpretation and enactment cycle is applied in all data analysis activities, i.e., cues extraction, data transformation and building stories through cognitive frames.

The SSF draws attention to the central role of HRAP 'action' in noticing and interpreting iteratively. The framework recognises the presence of TTAs through HRAPs affordance as a means of making and giving sense. It discusses the analyst's interaction with these tools to support their cognition while extracting data and business context cues, data transformation, and crafting stories from data analytics findings. The SSF argues that sensemaking and sensegiving are accomplished through managing the oscillation between the complexity of thought and simplicity of action, order and disorder, questioning the past frames and underlying assumptions through HRAPs reflexivity for their intentional use rather than automatic. Finally, the merits of utilising SSF as a theoretical framework to unpack the sensemaking and sensegiving practices and their underlying practices and activities are discussed.

4.2 Sensemaking and Sensegiving in Data Analytics

HRA, or any analytical process, is often treated as both an art and a science as it can synthesise data into meaningful information (Fitz-enz and Mattox 2014; Corrigan 2015; King 2016). In this hi-tech age, the human interpretative aspects of HRA involve human intervention through mental frameworks and logical understanding of the available data and information and the problems through thoughtful technological manipulation of data for the required level of insight into organisational reality to address relevant questions and problems at hand (Weick 2012; Calvard 2016; King 2016). In other words, data analysis necessitates creating meaning around information in a social context (Fitz-enz and Mattox 2014).

In the data analytics context, sensemaking is a motivated, deliberate, continuous endeavour to understand and interpret relationships within data to foresee their pattern and act effectively (Klein et al. 2007). Sensemaking has many distinctive features, including "comprehending, understanding, explaining, attributing, extrapolating and predicting" (Maitlis and Christianson 2014: 62). All these attributes of sensemaking are put into practice by HRAP in the data analytics operation, which is an information-seeking and processing task to acquire an understanding of an idea, subject area and situation (Zhang and Soergel 2014).

In the context of this study, the HRAP performs a goal-directed iterative and cyclic process of seeking explanations and removing ambiguities and uncertainties by searching for and organising similarities and differences within data patterns and other relevant cues (Grolemund and Wickham 2014). HRAP's sensemaking is about finding answers in the data and its relevant context (Cascio and Boudreau 2016; Simón and Ferreiro 2018), driven by having correct data and sound interpretations (Boudreau and Ramstad 2005; Fitz-enz and Mattox 2014), whereas sensegiving is persuasive articulation to decision-makers (Calvard 2016). Pirolli and Card (2005) have proposed a sensemaking model for intelligence analysis of the data comprising two cognitive loops, i.e., forging and sensemaking loops. According to Pirolli and Card (2005), the foraging loop involves looking for, filtering, reading and getting data to identify relevant categories. The sensemaking loop involves developing a mental model from schemas and evaluating their accuracy by conducting operations such as searching for evidence, support and inducing relations (Pirolli and Card 2005).

Similarly, Klein et al. (2007) put forward the data frame model of sensemaking, which involves framing and reframing that helps filter and interpret data while assessing and revising the frame. Frames are explanatory constructs that explain the data and guide the search for more data (Klein et al. 2007). According to Klein et al. (2007), sensemaking starts with constructing a basic and minimal frame, allowing an understanding of the problem, which can be further refined by questioning the initial frame and gathering more cues and explanations. Eventually, this process could lead to maintaining or expanding the frame or starting a reframing process, in which a different and improved frame is created, and sensemaking terminates when there is coherence between data and frame (Klein et al. 2007).

Similarly, Grolemund and Wickham (2014) view data analysis as parallel to sensemaking from the cognitive interpretative perspective. They argued that analysts infer an exact hypothesis (model) from their schema to compare with data to differentiate inconsistencies between their schema and data. Analysts apply these formulated hypotheses back to a schema to provide an interpretation of real-world problems (Grolemund and Wickham 2014). Most of the research has investigated the interpretative perspective (Pirolli and Card 2005; Klein et al. 2007; Grolemund and Wickham 2014) when studying analysts' roles while ignoring other aspects, such as engaging with key stakeholders to understand the organisational issues and associated context (Rasmussen and Ulrich 2015).

The research adopts a theory elaboration approach (Fisher and Aguinis 2017) with a guiding premise that HRAPs are engaged in active sensemaking and sensegiving practices through cognitive, discursive and material practices. This theory elaboration approach facilitates using pre-existing conceptual ideas as a theoretical foundation for this study through discovery rather than only validation (Van Maanen et al. 2007). The study provides an interesting opportunity to attend to 'how' and 'what' details in unfolding HRAPs' sensemaking and sensegiving practices through which they contextualise and attribute meanings by answering the following research question:

How are the sensemaking and sensegiving practices required as part of their role put into action by human resources analytics practitioners?

The above overarching question is broken down into two sub-questions to help further explore the sensemaking and sensegiving practices in a focused manner.

1. Through which cognitive and discursive activities are these sensemaking and sensegiving practices enacted by human resources analytics practitioners?

2. How are tools, technologies and artefacts engaged to support the cognitive and discursive practices when making and giving sense?

Sensemaking is about continuously drafting the emerging story for better comprehension through information, action, experience and conversations (Weick et al. 2005). Accordingly, the thesis conceptualises sensemaking and sensegiving in an analytical context from cognitive, discursive and material perspectives to explore HRAPs' role when making and giving a sense of the data and the context to pursue their analytical goals. Such an approach leads the research to focus on cognitive practices (Weick et al. 2005; Lüscher and Lewis 2008) and discursive practices (Rouleau and Balogun 2011; Whittle et al. 2015; Hultin and Mähring 2017) supported through the material practices (Kaplan 2011; Stigliani and Ravasi 2012).

The SSF conceives HRAPs' sense as a cognitive-discursive process (Sandberg and Tsoukas 2020) by which HRAPs assign meaning to data and relevant cues to interpret and what is going in a given context by ruling out the number of alternatives and possibilities Colville et al. (2013: 1203) and then simultaneously craft persuasive accounts to communicate and give sense to others. When HRAPs make and give the sense, this involves an interface of thinking–doing where analysts are required to question their ways of making and giving sense (Calvard 2016). Reflexivity connects thinking with doing and interpretation with action through a balancing act by being more aware of self and environment to construct meaning (Cunliffe 2002; Cunliffe and Easterby-Smith 2004; Guiette and Vandenbempt 2016). The SSF, outlined in Figure 4-1, brings to the forefront four assumptions of importance from the literature for understanding HRAP sensemaking and sensegiving

1. Sensemaking through cognitive and discursive practices
2. Sensegiving through conversations and storytelling
3. The materialisation of cognitive-discursive practices
4. Thinking and doing interface – capacity for reflexivity

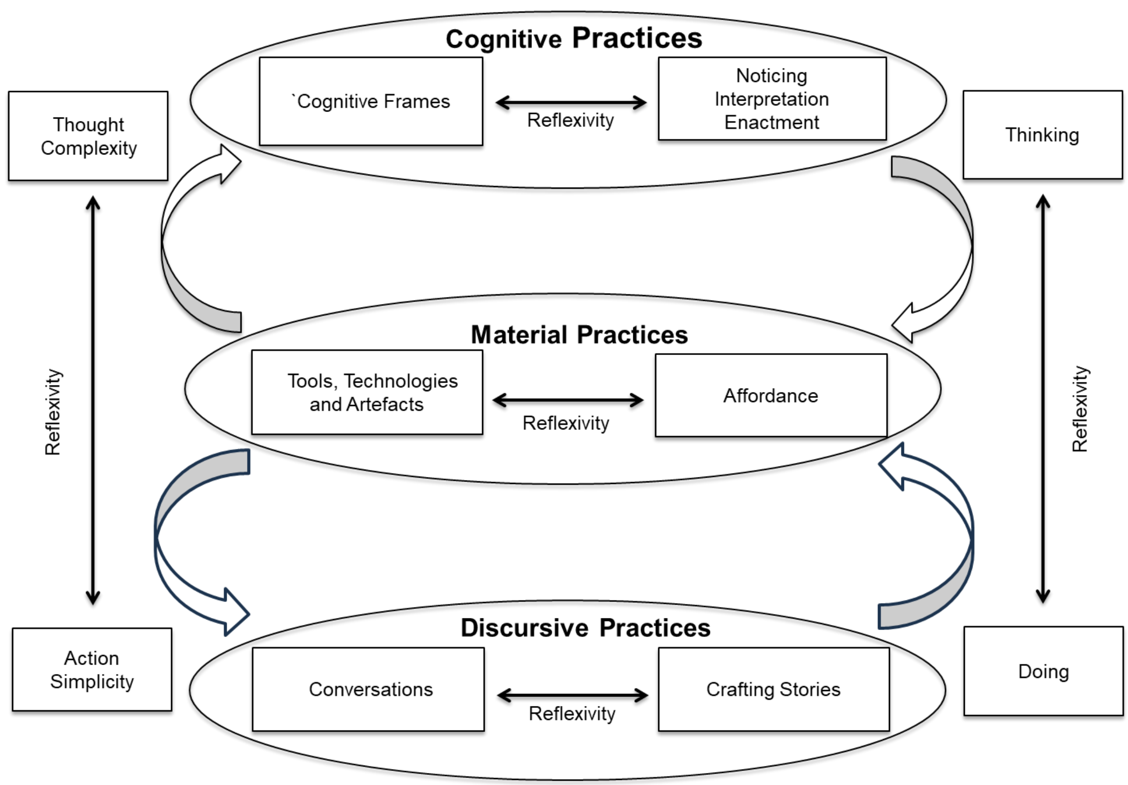


Figure 4-1: Human Resources Analytics Practitioner Sensemaking and Sensegiving Framework

4.2.1 Sensemaking through Cognitive and Discursive Practices

For HRAPs, the ongoing sensemaking activity aims to simplify and remove ambiguities and uncertainties by collecting relevant cues and data, identifying and fixing valuable patterns in data through interpretation to develop some sense and then refining them by enacting the way into the meaning (Calvard 2016). Attaining simplification means assigning meaning to the data precisely and granularly (George et al. 2014). Making things simpler and more coherent is not straightforward (Calvard 2016). When doing data analysis, it may be necessary to strike a delicate balance between reductionism, which promotes sensemaking, and playful plurality, which prohibits the unification of interpretations and recognises the possibility of learning during the course of analysis (Serres 1995). HRAPs allude to the ongoing cycle of collecting and analysing data and cues to reach coherent and straightforward interpretations from the complex stream of data (McAfee and Brynjolfsson 2012; Calvard 2016). In other words, achieving coherence means connecting cues, interpretation and action (Colville et al. 2016).

The HRAPs' sensemaking relies on the availability of noticeable and reasonable structures/frames or discourses that provide them with plausible explanations of what is happening and why (Fiss and Zajac 2006). These knowledge structures in the form of frames or discourses influence the HRAPs' observations and beliefs, either constraining or expanding the set of possible understandings based on which they attend to the cues in the context to construct and evaluate plausible, coherent understandings of the situation (Weber and Glynn 2006). Established domain-specific discourses or rationalities provide ready-made hegemonic prototypes or plots through which HRAPs can elaborate and ‘normalise’ the situation to coherent explanations and understanding (Mantere and Vaara 2008; Schildt et al. 2020).

The ability to notice and perceive cues is an important capability HRAPs must develop as part of their experience (Weick et al. 2005; Yakhlef and Essén 2013).

The ability to notice is primarily driven by habits, preferences, beliefs and expectations (Starbuck et al. 2006). In practice, this means developing a noticing or spotting system that can filter what needs response through sensemaking and what needs to be ignored in an environment where cues operate simultaneously, individually or in an integrated manner (Starbuck and Milliken 2006). Alongside extracting relevant cues from the business context inside and outside the organisation through cognitive and discursive means, cues extraction in data analytics relies on measured data, i.e., numbers in a given context (Grolemund and Wickham 2014). HRAPs must identify which data is valid and discard data that may not be useful or relevant for critical business issues, as not all data is valuable (Morrison 2015; Isson and Harriott 2016). Incorrect or irrelevant data may lead to incorrect interpretation (Strohmeier and Piazza 2013).

The SSF further argues that frames are the cognitive framework that simplifies the HRAP's information processing and helps to interpret the data efficiently (Bingham and Kahl 2013). Frames as a mental model provide a temporal connection of past, present and future to interpret the present (Maitlis and Sonenshein 2010; Maitlis and Christianson 2014). HRAP’s frames are past moments of socialisation representing the structure of experience retained based on prior learning (Dane 2010; Bingham and Kahl 2013). This retention of frames through learning from past sensemaking experiences influences sensemaking's interpretation and enactment phase for the present cues (Colville et al. 2014; Colville et al. 2016). Instead of storing every sensory observation, HRAPs only need to maintain or update their frames, which may be appropriate abstracts of all earlier observations (Dane 2010).

In the data analysis context, frames assign meaning to the data, help invigorate and structure action (Elsbach et al. 2005; Nadkarni and Narayanan 2007), and identify the connections between data points (Klein et al. 2007) and organisational context. The cognitive frames enable HRAPs to deal with situations they face with known purposes (Das and Teng 1999). Once the relevant frame is associated with the context cues or the data points, the HRAP can access unobserved information related to that event or the data from the environment (Grolemund and Wickham 2014). More specifically, in the presence of measured data, the role of frames in extracting cues gets facilitated as data brings specific attributes in the form of consistency and precision, which allow frames to reach out to cues and reduce the tendency to let them go unnoticed (Grolemund and Wickham 2014). In addition, frames can also act as data-reduction devices (Grolemund and Wickham 2014), enabling individuals to comprehend complex and confusing realities, respond to events/data, and facilitate the construction of reality as part of sensemaking efforts (Fiske et al. 1991).

Based on the complexity of their frames, HRAPs attempt to approach the analytical tasks. For example, HRAPs with low-complexity frames are likely to collect cues and data from fewer selected sources, and, as a result, they may not fully notice the variety of cues in their organisational environment (Ancona 2012; Colville et al. 2013). On the other hand, HRAPs with complex frames are likely to combine the cues and data gathered through both cognitive and discursive means from various sources to generate perspectives that can incorporate a variety of cues, even if they are contradictory (Kiesler and Sproull 1982). When HRAPs can formulate a more complex conceptualisation of their context, they may be able to draw together all forms of data while considering the views of a broader range of stakeholders through conversations and even notice subtle cues (Wong et al. 2011).

At the same time, SSF argues that when frames represent unresolved conflicting or complex relations between several elements, HRAPs are more likely to notice and interpret unstructured, irrelevant and unreliable cues from the context (Colville et al. 2013). The sensemaking process might be broad but somewhat unclear as the range comes at the expense of a detailed cues/data search and interpretation (Das and Teng 1999). While HRAPs can cope with tensions, uncertainties and complex interconnection between various organisational aspects, their scanning and interpretation may remain inconclusive (Kiesler and Sproull 1982). Thus, superior technical resources may often enhance HRAPs' ability to collect and interpret more detailed and relevant data effectively and efficiently since data collection and interpretation is time-consuming and costly (Zammuto et al. 2007).

The SSF also argues that, even with abundant resources, HRAPs may find it challenging to interpret data and cues that are ambiguous and complex. The interpretation process also means avoiding the tendency to strive for simplicity through overly simplistic interpretations, e.g., the impulse to lie with statistics (Huff 1991), while preventing a situation of analysis for paralysis. Clegg et al. (2005) suggest striking a delicate balance between complexity, simplicity, order and disorder when faced with complex situations. Guiette and Vandenbempt (2016) view sensemaking as more than a tool to reduce ambiguity or resolve distractions; instead, it is a way of navigating the often contradictory way of experiencing the world through acknowledging and coexistence of complexity and simplicity, order and disorder (Clegg et al. 2005).

The framework foregrounds enactment's role in sensemaking, as sensemaking is not a passive process but is enacted thinkingly as the interaction of action and interpretation (Weick et al. 2005). Enactment becomes the source of expanding the sensemaking horizon by making tacit knowledge explicit (Colville et al. 2016). As Weick (1988) suggested, action is an integral part of sensemaking as HRAPs interpret the realities they face by taking action and finding out what happens next as human cognition leads to action. First, as part of the sensemaking process, actions are important because HRAPs can learn more about reality by taking action and noticing the cues generated by that action (Weick 1988). Second, when actions are taken purposely, they can help test understanding generated through preceding sensemaking attempts. Third, actions shape the environment for sensemaking as the actions that help HRAPs make sense of what is happening can also modify what they face and change the condition that triggered sensemaking in the first place (Weick 1988).

When viewing sensemaking as a continuous process, the SSF also draws attention to plausibility, which is vital for understanding why some experiences are comprehended immediately and assigned meanings while others are not (Helms Mills et al. 2010). The plausibility feature of sensemaking is relevant as sensemaking in data analytics is about continuously drafting the emerging sense for better comprehension through actions (Sandberg and Tsoukas 2015). This initial plausible sense helps HRAPs take action and create further opportunities to refine the sense over time with supporting evidence to improve their comprehension and subsequent analysis (Weick 1995; Weick et al. 2005; Ancona 2012; Munro and Huber 2012).

4.2.1.1 Cognitive-Discursive Lens on Sensemaking

In criticising the predominant conceptualisation of sensemaking as a cognitive and discursive process, scholars have suggested taking a more comprehensive and richer approach to studying sensemaking in various organisational contexts (Maitlis and Christianson 2014). Although seminal work in sensemaking exhibits cognitive (Balogun and Johnson 2004; Balogun and Johnson 2005) and discursive means (Rouleau and Balogun 2011), explicit linkages to and between these cognitive and discoursive means have become salient only in more recent research (Sandberg and Tsoukas 2020).

In this context, recent studies have begun to shed light on how cognitive and discursive modes mutually and recursively contribute to making and giving sense. For example, Werner and Cornelissen (2014) recognised that discursive and cognitive frames are distinct concepts and explained how discursive and cognitive frames are mutually and recursively interconnected while constructing the meaning in context. While doing so, Werner and Cornelissen (2014) argued that such characteristics are essential to understanding the pattern of differences between situations where already available frames of reference or cognitive frames are and where frame-based meanings are actively constructed by actors in the organisation.

In order to elucidate this linkage between cognitive and discursive perspectives and their dynamics, Whittle et al. (2023) proposed an integrative theoretical framework to understand better how different linguistic processes/tools/ including discursive means, shape the construction of meaning in sensemaking. Whittle et al. (2023) explained how discursive structure enables or constrains sensemaking by providing means to make particular cognitive connections or place a particular cue or issue into a broader cognitive framework for cognitive association and processing. Similarly, Weiser (2021) suggests an integrative model that represents sensemaking during strategic change as a multimodal process involving intellectual, substantive, and experiential drawing, both cognitive and discursive modes of engaging with change by organisational leaders.

Furthermore, the literature has pointed out cognitive-discursive orientation towards practitioners' sensemaking, as, in the practice world, the boundaries between cognitive and discursive practices are less distinct when organisation actors while immersed in their practice (Sandberg and Tsoukas 2015; Sandberg and Tsoukas 2020). Some researchers argue that the boundaries between cognitivist and linguistic approaches are permeable, and, as a result, they view sensemaking as a cognitive-discursive process of meaning-making in certain situations in organisational practice (Weick 2022; Whittle et al. 2023). Sandberg and Tsoukas (2020) argue that when practitioners engage in their activities, the practice warrants a deliberate and detached mode of sensemaking to generate conceptual sense around the activity through cognitive-discursive practices.

A primary limitation of approaching sensemaking from either a cognitive or discursive perspective is that it treats the practitioners' experience at times in isolation from their social environment. Consequently, the cognitive perspective alone does not capture or explain thoroughly how HRAPs interpret the data and cues and create interpretative opportunities that transcend their past (cognitively stored) experiences (Rouleau and Balogun 2011). The role requires HRAPs to articulate their cognitive interpretation and experiences through conversations and reveal cognitive interpretations (Whittle et al. 2023). Similarly, the conversations also require cognitively recorded experiences and internal reasoning to structure the thoughts and validate them through cognitive frames. While HRAP sensemaking involves abstract/cognitive understanding and simplification, it is also created and reconstructed in ongoing discursive activities (Rouleau and Balogun 2011), sensegiving, justification and legitimisation (Vaara and Monin 2010).

Both traditions' respective foci and limitations suggest, and SSF argues, that they are complementary: the cognitive means allow HRAPs internal, self-conscious and cognitive process to develop an account of what is happening. At the same time, the discursive emphasises the process of evoking meaning in context. The SSF, therefore, bridges the established cognitive and discursive traditions in that it sees discursive means as not simply an extension or representation of cognitively recorded experiences but as a tool that HRAPs use to create sense for themselves and others when executing their roles. The SSF views HRAPs' sensemaking as cognitively discursively accomplished reflexive engagement with their analytics practice in a detached manner (Christianson 2019; Sandberg and Tsoukas 2020; Schildt et al. 2020; Weick 2022).

The SSF classifies HRAP sensemaking as a detached-deliberate type of sensemaking as it involves engaged abstraction that generates a conceptual sense and practical sense of the analytical activity, reflecting on and looking for emerging patterns within data and other cues while entrenched in their primary practice world (Sandberg and Tsoukas 2020). In this situation, sensemaking is enacted through cognitive-discursive means to construct the conceptual abstraction of the sense by reflecting on the situation while engaged in the practice (Sandberg and Tsoukas 2020; Schildt et al. 2020). From a cognitive perspective in data analytics, sensemaking aims to bring about cognitive order, which involves mobilising several interpretive frames, cognitive categories, and reasoning procedures for conceptualising the data and cues. From a discursive perspective, HRAPs use sensemaking and sensegiving to talk about practices and underlying activities rather than performing those practices activities (Cornelissen and Clarke 2010). In other words, discursive means are mainly used representationally by HRAPs for engaging in conversations, identifying and relating the trends and patterns in the data and other relevant cues.

The framework argues that discursive and cognitive structures, when pursued jointly, can become enabling and empowering resources through reflective/reflexive sensemaking (Schildt et al. 2020). Discursive means of interpretation provide additional tools to HRAPs beyond cognitive means when making sense (Taylor and Van Every 2000). Thus, much may be gained from moving towards an approach that sees the sensemaking of HRAPs as cognitive-discursive. While recent work has highlighted the importance of cognitive and discursive as a complementary perspective to sensemaking, there is limited understanding of how cognitive and discursive, when pursued together, shape sensemaking as a whole. For example, when cognitive-discursive practices as sensemaking resources are engaged jointly, this raises a further question: how should discursive means best proceed along with cognitive means and vice versa to facilitate sensemaking? The ability of HRAPs to attend to and critically reflect on their diverse frames acquired through cognitive-discursive means allows them to either validate their past frames or formulate new understandings that surpass their prior frames (Jay 2013). The cognitive-discursive meaning-making practices can potentially provide resources and a broader evaluation framework to articulate and explain various appealing accounts (Maitlis and Christianson 2014; Sandberg and Tsoukas 2020). However, the SSF does not assume that any single discursive or cognitive means fit all possible sensemaking situations and contexts for HRAPs.

4.2.2 Sensegiving Through Conversations and Storytelling

While performing their role, HRAPs manage themselves at the periphery of what they do not know (Hill and Levenhagen 1995). As such, HRAPs seek to make ambiguous events/ situations non-ambiguous and offer solutions to business problems by offering insights to their stakeholders. First, HRAPs need to make sense of the situation, after which they can communicate their reality to other stakeholders (sensegiving). Shaping meaning and labelling problems is critical to HRAPs' sensegiving, often triggered by ambiguous and unpredictable sensemaking environments involving stakeholders with differing interests. In such situations, HRAPs' discursive ability allows them to construct and articulate persuasive accounts in support of their sensegiving (Maitlis and Lawrence 2007). Underpinning this discursive ability are the appropriate conversations with the right people at the right time (Rouleau and Balogun 2011).

The presentation of the outcome of an analytical exercise should not be treated as simply a reporting exercise of presenting data in black-and-white numeric tables. Instead, the task for the analysts is to articulate the analytics findings into business insights to facilitate a comprehensive understanding of the situation at hand and mobilise support among intended stakeholders (CIPD 2017; CIPD 2018). Prior research demonstrates the challenge for practitioners in communicating the findings due to the complexity of data and the associated contexts (Calvard 2016). If analytical insights and findings are not understood and compelling, end users will not act on them (Welbourne 2015). To make insights and findings simple and appealing, HRAPs face the emerging need to simplify vast amounts of complex data and be able to offer compelling accounts for decision-making through ongoing conversations (McCartney et al. 2021).

In the light of the above backdrop, the SSF views HRAP’s sensegiving as an imaginative, contextually situated, deliberate attempt to weave their sense of data and the context in a particular way to influence the audience, driven by the intention to share intricate knowledge (Brown et al. 2008; Knaflic 2015; Boldosova 2019). Compelling conversations using data and other contextual knowledge is required to ensure that insights are delivered to the targeted constituencies to maximise the prospect of taking action. Hence, the SSF argues that sensegiving through discourses and narratives is particularly relevant in analytics to achieve shared knowledge representation (Calvard 2016).

Over the last decade, the literature on data analytics has called for using stories when communicating findings through data (Segel and Heer 2010; Knaflic 2015; Mirkovski et al. 2019). As such, the SSF consider storytelling central to HRAPs practices to craft their conversations surrounding data, what Dykes (2020) calls the art and science of data storytelling. More specifically, SSF acknowledges how future-oriented and more utopian or dystopian narratives and stories are particularly crucial as they carry the possibility that data can create opportunities for improving organisational systems and processes (Boyd and Crawford 2012).

Storytelling in data analytics can range from HRAPs' everyday conversations to the more scripted stories delivered through formal business presentations (Martens et al. 2007). Stories in HRA have an ontological and an epistemological function as HRAPs can use stories to construe organisational reality (Weick 1995; Czarniawska 1998) and affect listeners' interpretations of that reality, mobilising support for actions (Fenton and Langley 2011). These stories can offer simplicity and closeness of experiences to the audience, easy to comprehend for enhanced impact (Bruner 1991). Stories can influence contextualising findings of the analytical task in terms of their connection to the objectives and familiarity with the context for its relevance (Welbourne 2015).

Analytical storytelling is the step towards bridging the gap between insights and action for ubiquitous decision-making through data, as it can put data insights into the context and inspire action from the audience (Boldosova and Luoto 2019). Stories can bring data to life by connecting with stakeholders' hopes, fears and motivations to encourage and guide the necessary actions (Dykes 2020). Analytical storytelling enables the analyst to facilitate decision-making from instinct-driven to data-driven by communicating insights through data, interacting visuals, and compelling stories around these visuals that are easily understandable and relatable (Knaflic 2015). As part of storytelling, while data visualisation provides the “what” in the story, it is the narrative that answers the “why” (McKenna et al. 2017). Visualisations supporting storytelling can help reveal data insights with simplicity, accuracy, and efficiency. In the same way, Kirk (2019) contends that the goal of using visuals is to support the communication of critical messages clearly and effectively, emphasising the context and meaning through visual enhancement.

4.2.3 The Materialisation of Cognitive and Discursive Practices

In addition to cognitive and discursive means, the framework extends the scope of sensemaking and sensegiving to include the influence of material practices while making and giving sense. While doing so, the SSF assumes a human-centric viewpoint on information processing in analytics activities. The research is interested in joint human material systems with a human core. In such an approach, although the HRAPs may not take on the bulk of information processing, they, as human actors, are an essential component of the system and often assume the majority of control in the performance of the analytical activity through TTAs. The SSF recognises that sensemaking and sensegiving in HRA represent human cognitive and discursive elements and incorporate the role of TTAs as "rich in organising resources" (Hutchins 1995: 2).

These TTAs allow HRAPs to draw on new ideas and new ways of working with ideas and process them with greater accuracy, faster and longer than inside their memory (Parson and Sedig 2014). The SSF argues that for HRAPs to make sense of their experiences and data would require them to step outside of their lived experience (Weick 1995). In this respect, when acquiring material form, HRAPs' experience and data separate from their minds and are made available for more conscious processing. This materiality feature resonates with Weick (1995) claim that one cannot know what one believes until one sees what one speaks. Unlike human cognitive capacity and discursive means, TTAs are intrinsically durable, allowing permanent data and information storage, retrieval and manipulation as required by the task (Stigliani and Ravasi 2012). These TTAs become sensemaking resources (Gephart 1993) to store, retrieve, and manipulate to make sense and share with other team members as part of sensegiving.

A variety of TTAs, from statistical tools, whiteboards and simple visual aids to advanced computational tools, are put into practice in the analytical work to the extent that it is difficult to separate the HRAPs from them. (Orlikowski 2007; Schultze and Orlikowski 2010; Grolemund and Wickham 2014; Berthod and Müller-Seitz 2018). From a materiality perspective, these TTAs process and display data and information with their visually perceptible interface (Parson and Sedig 2014). Well-chosen external representations or cognitive tools can be put into practice in all sub-processes of sensemaking, such as guiding access to cues, helping to attend to frames and facilitating interpretation and sensegiving beyond a humanly possible manner (Grolemund and Wickham 2014).

These TTAs help with processing outside human limited memory; they are also integral components of a sensemaking process and fundamentally shape and alter it (Norman 1991). These external representations can extend human reach by performing tasks such as permanently archiving large amounts of data, making abstract information directly accessible, suggesting solutions by allowing the selection of the most suited options and making complex cognitive tasks more manageable (Clark and Chalmers 1998; Clark 2008). Similarly, these TTAs can guide HRAPs attention to the cues through knowledge structures, mental models or other forms of mental representation and give them a form that can be shared and retrieved at a later stage in support of sensemaking and sensegiving (Stigliani and Ravasi 2012).

The SSF assumes that the paradox of simplicity and complexity as part of cognitive and discursive practices can be addressed through HRAP interaction with various computational devices through affordance (Leonardi 2011; Faraj and Azad 2012; Volkoff et al. 2013; Fayard and Weeks 2014; Lehrer et al. 2018). In this regard, the SSF shows that the HRAP sensemaking and sensegiving intent and interpretations of TTAs guided by the perceived action possibilities (affordance) lead them to act in specific ways to achieve their objectives (Demir 2015; Dremel et al. 2020). Affordances can influence HRAPs to act and become aware of the action possibilities within the realm of practice (Reed 1996). In addition, the framework assumes that such affordances come in bundles in an analytical task, offering multiple action possibilities in various combinations for assigning meaning through action (Demir 2015). Hence, affordances are perceived as valuable and meaningful based on the HRAPs' choices driven by their goals (Fayard and Weeks 2014). As Dreyfus and Kelly (2007) noted, acting skilfully through affordances means that HRAPs are drawn to act in a certain way, i.e. to manipulate, modify or even manufacture the outcome.

The benefits of mindful engagement with TTAs are partly explained by the fact that the externalisation of cognitive work potentially compensates for the inherent limitation of the human mental capacity to store, retrieve, and process the information/data (Norman 1991; Hutchins 1995). These resources shape sensemaking by extending human cognitive capacity (Stigliani and Ravasi 2012). The framework argues that the goal of using TTAs is usually to augment the sensemaking and sensegiving capacity by altering the mental state of the analysts (Comi and Whyte 2018). In other words, the performance of activity through the support of TTAs results in some change in the HRAP’s knowledge, belief, frames or other forms of internal mental representation.

The affordance perspective potentially allows tracing HRAPs' sensemaking and sensegiving actions that bring forth particular realities in practice by focusing on situated and relational practices prompted by action possibilities (Leonardi 2011; Fayard and Weeks 2014). From this perspective, HRAP sensemaking is incomplete if the sole focus is on HRAP’s cognitive and discursive processing, as the content and process of sensemaking and sensegiving may dramatically change with the use of TTAs (Stigliani and Ravasi 2012). Alongside affordance, the SSF extends the HRAP's reflexive practices to reflect on patterns of relational practices and the associated complexities created by these interactions with external TTAs when put into practice (Keevers and Treleaven 2011). The key here is that reflexivity helps

HRAPs raise their sensitivities and anticipation by mapping the impacts and consequences of their entangled practices with tools (Hultin and Mähring 2017).

4.2.4 Thinking and Doing Interface – Capacity for Reflexivity

In data analytics, HRAPs are required to interpret the situations they encounter and adjust their new actions based on the outcome they observe. In other words, when enacting their roles, analysts aim to catch reality in-flight (Pettigrew 1990), i.e., on the move, as, metaphorically, life is experienced on the go (Colville et al. 2016). This process of catching the reality and associating it with making sense of the past, finding out what is going on in the present moment, or looking into the future may involve being more aware of how to construct meaning by questioning ways of making sense (Cunliffe 2002; Cunliffe and Easterby-Smith 2004; Guiette and Vandenbempt 2016). According to Calvard (2016), HRAPs are required to operate with flexible interpretative routines and practices with more improvisation and creative action.

The SSF argues that there is ongoing acting and thinking interplay, where meaning is construed by that HRAP action, which, in turn, becomes a springboard for the subsequent action. HRAP's sensemaking and sensegiving involve thinking while doing, i.e., understanding and creating the environment concurrently, as interpretation and action go hand in hand (Weick et al. 2005). In practice, while connecting thinking with doing, HRAPs may need to question their assumptions, use of language, behaviours and tools, and are guided towards those phenomena that currently do not make sense or have a different understanding (Cunliffe and Easterby-Smith 2004). From this perspective, sensemaking and sensegiving become an iterative process of experiencing, thinking and acting by questioning, shaping and reshaping senses and sensibilities (Pye 1994). HRAPs' experience can be characterised as the dialogical practice of moment-by-moment, back-and-forth interactions and connections with self and others (Shotter 1993; Cunliffe 2002). This practice involves understanding and manipulating experiences from within the experience by crafting a version of reality deemed appropriate in that particular situation (Shotter 1993) and becoming mindful of how to exemplify and sustain new realities alongside discovering the existing realities (Cunliffe 2002).

Furthermore, making sense of data can be a complex process; HRAPs require sensemaking skills that characterise the blending of sufficient complexity of thought to notice and register the cues in a complex situation with the necessary simplicity of action, which explains situations by eradicating inconsistencies and seeking coherence (Colville et al. 2012; Colville et al. 2016). From a sensemaking perspective, this ongoing tension between the complexity of thought and simplicity of action is not only a quantitative challenge in terms of more complexity of thought than the complexity of action but also a qualitative one in terms of balancing different sensemaking qualities of action and thought process (Colville et al. 2012). For HRAPs, seeking clarity means going one step further in shaping the sense by shifting the balance between thinking and acting towards acting while also knowing what is unknown (Colville et al. 2016). HRAPs are advised to operate with the wisdom of simultaneously having doubt and belief through curiosity, humility and open-mindedness while appreciating that they may not know things entirely and that their knowledge is imperfect (Weick 2009). In other words, HRAPs need to be aware of the sources of our ignorance (Nonaka et al. 2014).

The SSF also draw attention to the notion that when managing processes and people within these complex environments, there are inherent tensions/contradictions present in all facets of organisational life, including leadership (control vs empowerment), teamwork (task-focused vs relationships focused), strategy (competition vs collaboration) and structure (centralised vs decentralised) (Smith and Lewis 2011; Lewis and Smith 2014). When pursued jointly, these contradictions and tensions are often referred to as paradoxes management, which is a term used in the literature to describe the tensions organisations and actors individually or jointly face due to the co-occurrence of contradictory demands, dilemmas, conundrums, polarisation, competing values and contradictions (Smith and Lewis 2011; Lewis and Smith 2014).

The SSF argues that managing these inherent interpretative paradoxes and contradictions through reflexivity is crucial to executing the analysts' role. Equally, while theorising interpretative challenges of BD, Calvard (2016) brings to the forefront the paradoxical challenges in managing BD projects' complex form and content and the chosen ways to interpret and act on analytic results. Calvard (2016) calls for resolving these competing demands in analytics through the successful interplay of sensemaking and learning from experience via reflexive awareness so that the paradoxes can be continually worked through. Similarly, Jörden et al. (2021), as part of HRAP's identity performance scripts, highlight the competing tension between the customer requirements and the scientific rigour of their analytical project.

These competing demands and contradictions become the source of sensemaking and sensegiving for the organisational members (Gioia and Chittipeddi 1991; Weick 1995). It is essential to recognise that the perceived tension between contradictory demands is triggered through certain enabling conditions, such as resource scarcity, time paucity, the plurality of stakeholder demands and the changing organisational environment (Smith and Lewis 2011). Organisation actors recognise the demands of these competing logics based on their espoused assumptions and the alternate assumptions to move from latency to saliency (Andriopoulos and Manto 2017). In other words, these tensions are only perceived if the HRAPs juxtapose the competing assumptions and infuse them with dual saliency (Sharma and Good 2013). Eisenhardt and Wescott (1988) elaborate that the concurrent quest of conflicting demands drives the questioning of underlying assumptions, extensive exploration and insight into experiences and relationships, and continuous investigation. According to Eisenhardt and Wescott (1988), this pursuit of paradoxical demands may result in creativity as organisational members must look beyond the obvious and re-examine their assumptions.

In this regard, previous research has suggested new ways of thinking about ideas that contradict one another but are interconnected through implicit links (Smith and

Lewis 2011). By making these links explicit, individuals have come to make sense of them and reframe them so that even seeming contradictions or tensions are opportunities and advantages (Chen and O'Mahony 2009). Reframing these conflicts beyond either/or problems to both/and approaches may enable practitioners to produce an outcome superior to tackling one demand at a time (Sharma and Good 2013). However, practitioners must seek acceptance before reframing, which means a new understanding of contradictions, conflict and opacity (Poole and van de Ven 1989). Sharma and Good (2013) highlight how middle managers, through situated discourses as part of their sensemaking and sensegiving practices, rationalise using both/and approaches to navigate through competing social and profit logic demands in a non-profit organisation. Similarly, Knight and Paroutis (2017) examine leadership sensemaking practices of orchestrating the attention of lower-level managers to a repeated and converging constellation of cues that enable various latent organisational paradoxical tensions to become salient.

The ability of HRAPs to question their assumptions of multiple, contradictory and competing demands of their roles and expectations from the stakeholders stems from their reflexivity (Lüscher and Lewis 2008; Robert and Ola 2021). The reflexivity calls for questioning the causal explanations of the paradoxical issues, their complexity, and more profound implications, and elaborating the alternative understandings and possible responses to the issue (Woolgar 1988; Cunliffe 2002; Cunliffe and Easterby-Smith 2004). In addition to questioning the assumptions, reflexivity helps HRAPs question the potential impacts of their insights and actions and consider new options (Keevers and Treleaven 2011).

Reflexivity also means practitioners purposefully iterate between paradoxical elements to ensure that due attention is paid to them. This enables them to prevent themselves from being paralysed, often in vicious cycles, and instead start the process of navigating paradoxical experiences (Smith and Lewis 2011). HRAP sensemaking based on practical reflexivity takes on a broader meaning, incorporating epistemological and ontological dimensions (Cunliffe and Easterby-Smith 2004). From an epistemological perspective, while sensemaking involves explicit theoretical knowledge, skill or 'know-how', practical reflexivity incorporates an ontological knowledge of how to be, interact and act in an environment (Cunliffe and Easterby-Smith 2004) using TTAs (Schultze and Orlikowski 2010). From a relational perspective, Cunliffe (2003) argues that practical reflexivity becomes crucial, allowing practitioners to question how they relate to self and others, including tools, and reach out to the tacit knowledge and assumptions often residing deep within them and impacting their sensemaking efforts.

HRAPs reflexivity can come from three sources: (a) the contextual embeddedness, (b) their interaction with the stakeholders and the TTAs, and (c) the individual characteristics of these paradoxes. Embeddedness in multiple contexts can potentially enable HRAPs to manage these conflicting demands to their advantage and equip them to engage with and manage others. The extant literature has also emphasised that the HRAPs' cognitive ability to identify the coexistence of paradoxical elements sets them up for their reflexivity (Lüscher and Lewis 2008). Initially, the HRAPs experiencing newly salient contradictions as part of the paradox may not reconcile ambiguous elements and often respond with bewilderment, ignorance and unease, which triggers sensemaking (Jarzabkowski et al. 2013). As HRAPs recognise the contradictory elements' interdependence and persistent coexistence, they accept paradoxes and critically examine underlying assumptions to evolve a more accommodating view of the opposing elements (Smith and Lewis 2011). Lüscher and Lewis (2008) suggest a cognitive process of sparring in which linear thinking and decision immobilisation give way to reflexive questioning to accept paradoxes and seek plausibility in choices. This cognitive ability has been referred to as paradoxical cognition (Lewis 2000), both/and thinking (Cameron et al. 2014).

4.3 Summary and Conclusion

This chapter developed the conceptual framework underpinning the academic literature reviewed in chapters two and three to explore HRAPs' sensemaking and sensegiving practices. As such, the chapter brought together pertinent areas of the literature and key theories to explore the ‘what’ and ‘how’ aspects of practices as part of HRAP's unfolding sensemaking and sensegiving experience. The SSF argues that interpretive frames, cognitive categories, reasoning procedures, discursive means and material practices are explicitly and deliberately mobilised reflexively by HRAPs while making and giving sense. While doing so, the SSF provides an opportunity to study HRAPs' situated sensemaking and sensegiving practices and their underlying activities, shaped by their reflexive mode of engagement, either through cognitive or discursive means or both, with TTAs' support. The following chapter describes the methodological approach utilised to achieve the research aims empirically, exhibited in the SSF and expressed through the research questions.

Chapter 5 Research Methodology

5.1 Introduction

This research aims to explore and gain insight into the HRAPs' sensemaking, sensegiving practices, and underlying activities using SSF developed in the previous chapter. The nature of this exploratory study is complex and deep-rooted; therefore, for investigating this phenomenon, the research design and execution require a well-thought-out approach. This chapter sets out the rationale for the choices made as part of the research process: the logic that links research questions with each step of the research process, i.e., philosophical underpinning, research approach, methodological choice, time horizon, data collection approaches and data analysis.

The study deploys a ‘research onion framework’ to guide the research on various methods at the researcher's disposal to achieve methodological coherence between the research objective and the chosen methods (Saunders et al. 2019). From a philosophical perspective, the chapter outlines the justifications for having an interpretative stance rooted in subjective ontology to generate situated and contextualised knowledge through an abductive inquiry. From a methodological choice perspective, the chapter outlines the relevance of qualitative research methodology as the most appropriate methodology for collecting data in a cross-sectional time horizon. The rationale for researching in the UAE context and sampling approach is explained in support of the research design, followed by a detailed account of the thematic mode of analysis. The chapter also outlines a series of steps taken to enhance the trustworthiness of the research process. The chapter concludes with the elucidation of ethical considerations.

5.2 Philosophical Underpinning – Research Paradigm

As shown in Figure 5-1, the first layer in the research onion is about the underlying philosophical stance informing the research process. The underlying philosophical assumptions are essential before designing the research process as they relate to the nature of knowledge and its development (Saunders et al. 2019). In this regard, researcher views, beliefs and assumptions about the nature of the research and, more specifically, the research at hand significantly impact the designing and operationalising of the research (Creswell 2013). Whether these views, beliefs and assumptions are taken for granted or consciously adopted, they profoundly impact the research process, shaping the research questions and the methodology put into practice to collect, analyse and interpret the data (Crotty 1998; Sarah 2013). The literature on business research offers two aspects of research philosophy differentiation, i.e. ontology and epistemology, to develop an understanding of the underpinning philosophical stance and the knowledge development process (Crotty 1998; Bryman and Bell 2015; Saunders et al. 2019).

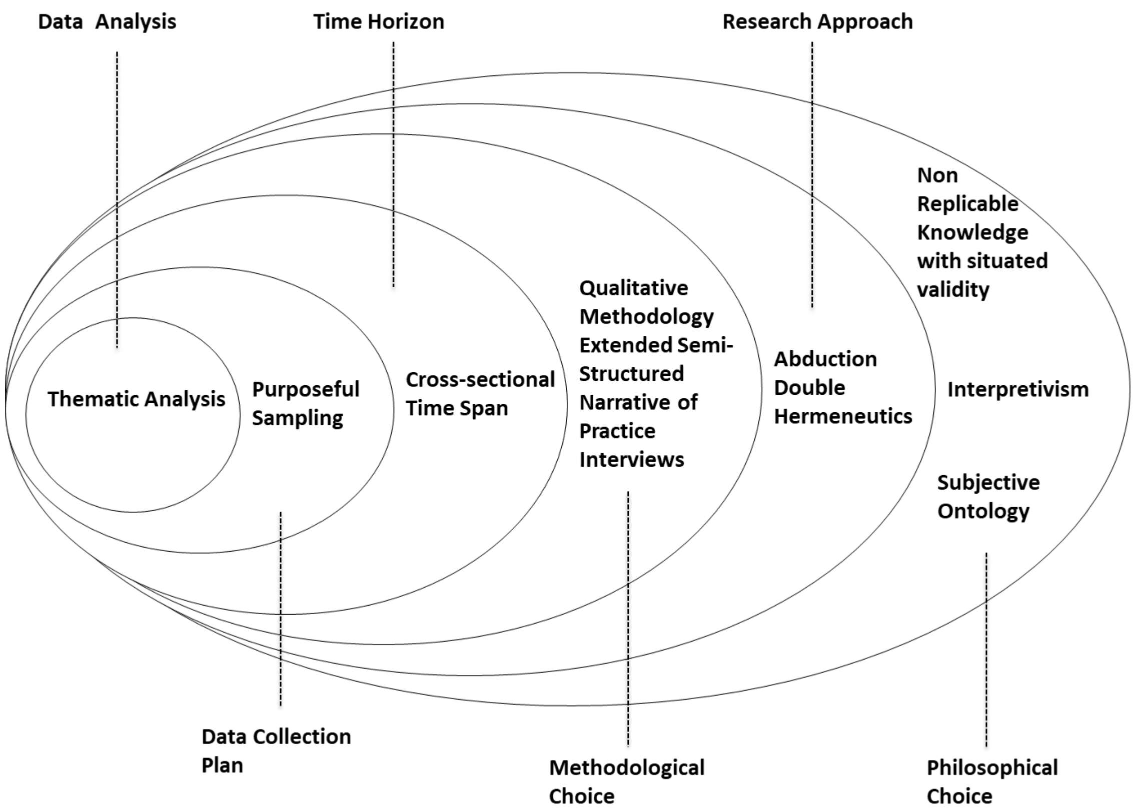


Figure 5-1: Research Onion, Adopted from Saunders et al. (2019)

5.2.1 Ontology

Ontological positioning offers a choice between two contrasting views to reveal reality (David and Sutton 2004; King and Horrocks 2010). The first view considers social entities as objective entities having reality external and independent to social actors, namely objectivism, whereas the opposing view considers reality as subjective and socially constructed through perceptions, feelings and actions of social actors, which is called subjectivism (Bryman and Bell 2015; Saunders et al. 2019). The objectivist stance represents the perspective that the research phenomenon is entirely independent of social actors, having characteristics of an object that can be fully captured by applying scientific laws and immutable principles (Stark et al. 2008).

Concerning the current research, it is problematic if the objective ontological position was adopted because participants' sensemaking and sensegiving may hardly be separated from those who had experienced it (Guba and Lincoln 1994) as meanings were constructed from an individual’s personal feelings, beliefs, biases and perceptions (Stark et al. 2008). Consequently, this study adopted the subjective ontological stance to capture the HRAPs' sensemaking, sensegiving practices, and underlying practices while accounting for individual differences and inherent complexity (King and Horrocks 2010). Similarly, the inside-out approach to reflexive practices of sensemaking and sensegiving also required a subjective approach that helped dissect the intertwined processes of sensemaking, sensegiving and reflexivity (Calvard 2016). The current study assumed human nature and its relation to the world as a sense maker and constructor of reality. In other words, HRAPs as research participants had a reflexive relationship with the organisational context around them, i.e. they constituted the environment, and the environment shaped their interpretation of reality (Cunliffe 2011). This process of reality construction was continuously updated through HRAPs' interaction with the context and the interplay between their thinking and acting (Tsoukas and Hatch 2001).

5.2.2 Epistemology

While ontology deals with the nature of reality (Saunders et al. 2019), epistemology is concerned with the development of knowledge (Crotty 1998), which adds a further dimension to the research endeavour by defining the nature and kind of knowledge which is constituted as acceptable knowledge as the outcome of this study (King and Horrocks 2010; Johnson and Duberley 2013; Saunders et al. 2019). Crotty (1998: 8) has described epistemology eloquently as “a way of understanding and explaining how we know what we know”. Implications of epistemological assumptions about methodological choice are essential to the research design (Cunliffe 2011; Johnson and Duberley 2013; Bryman and Bell 2015).

There are research approaches that can generate knowledge shaped by the observable facts, numeric data and relationship of variables, and the research outcome is replicable and generalisable (Cunliffe 2011). Knowledge in this form represents objective philosophy in which causes (possibly) determine outcomes through quantifiable observations and measurement of objective reality (Creswell 2014). Research knowledge focuses on sociality, human identity, behaviours and discourses rather than subjective lived experiences (Crotty 1998) and, therefore, shows a strong propensity to objective ontology through quantitative research approaches (Remenyi et al. 1998). On the contrary, this study required an approach that can deal with the situated knowledge produced from a subjective ontological stance through qualitative data as opposed to an approach that relies on data quantification and facts devoid of HRAPs contextual experiences and multiple interpretations of the reality encountered (Remenyi et al. 1998; Stark et al. 2008).

5.3 The Rationale for Adopting an Interpretivism Philosophical Stance

Both conceptual anchors of this study, i.e. sensemaking and sensegiving, are interpretative phenomena (Cunliffe and Easterby-Smith 2004; Maitlis and Christianson 2014; Sandberg and Tsoukas 2015), requiring a flexible and holistic approach to probe HRAPs multiple insights and situation-specific meanings in a world of lived reality (Schwartz-Shea and Yanow 2012). Therefore, within an interpretive epistemological stance, this study deployed a situated and bottom-up concept development process instead of strictly prior operationalising concepts into variables to produce contextualised and situated knowledge (Schwartz-Shea and Yanow 2012). The interpretive philosophy, from a subjective problematic stance (Cunliffe 2011), helped reveal the HRAPs' multiple realities rather than one reality (Stark et al. 2008), facilitating producing situated and contextualised knowledge as an outcome of this study.

Furthermore, the interpretive philosophy was also promoted by the interest to delve into HRAPs' cognitive and discursive sensemaking, sensegiving practices and underpinning activities. While doing so, the study brought the concepts and causality used by the HRAPs as part of continuous sensemaking and sensegiving experience to the forefront, i.e. how analysts explicitly and tacitly conceive their world of HRA (Schwartz-Shea and Yanow 2012). The interpretative approach allowed attention to be paid to “what” and "how" details in the unfolding practices through which HRAPs contextualise and attribute meanings to data and the context (Weick 1985). Furthermore, the interpretative stance facilitated the reflexivity to emerge from HRAPs' experience of questioning their ways of making and giving sense.

In other words, from the interpretative perspective, the research sought an explanation of the causality within HRAPs’ interpretation of their experiences in a contextualised manner through the interweaving of different meanings that may be contingent upon one another instead of logically coming out from each other (Hammersley 2008). In this research, HRAPs are social actors, and their social environment is different from any physical phenomenon because they may assign multiple meanings to social reality (Saunders et al. 2019). The interaction of contextual elements and their interaction with HRAPs is unique, where assigned meaning is a function of their interface with the environment (Remenyi et al. 1998). The interpretation and understanding of these meanings assigned by HRAPs have no single starting point; instead, their interpretation begins wherever it begins based on the interpreter's (including the researcher's) knowledge or understanding of that situation and context (Schwartz-Shea and Yanow 2012).

5.4 Research Approach

Before embarking on research design, it is essential to reflect on research approaches (methods of reasoning) and discuss the adopted approach to justify research reasoning and knowledge produced in line with the interpretative philosophical stance (Mantere and Ketokivi 2013; Bryman and Bell 2015; Saunders et al. 2019). Knowledge of these research approaches is considered necessary by Easterby-Smith et al. (2012) as it helps the researcher in making an informed decision on choosing the most appropriate approaches to data collection and its subsequent analysis in terms of what strategies may work and what might not while keeping in view their constraints and practical considerations to answer the research questions. In this regard, research methodology literature offers three approaches as the researcher's primary inference tools through reasoning: deductive, inductive and abductive (Saunders et al. 2019).

Deductive reasoning produces research knowledge, developed logically from a set of premises, and stands true when all the premises are true (Ketokivi and Mantere 2010). Deduction methods originate in the principles of the natural sciences, which involve formulating a hypothesis or a set of assumptions about the research phenomenon and testing a pre-determined theory, explanation or hypothesis using existing theories (Bryman and Bell 2015). Deductive research offers the possibility to explain causal relationships between the concepts and the variables based on logical reasoning and the data used to support the hypothesis (Saunders et al. 2019). The deduction approach cannot establish cause-and-effect relationships between variables through fixed methodology in highly structured research designs without understanding how social actors interpret their world in a particular context (Mantere and Ketokivi 2013).

Unlike the deductive approach, the inductive approach generates an explanation from the data collected to explore a new theory (Saunders et al. 2019). It is about moving from specific observations to broader generalisations and theories by looking for patterns in the data, with a view to developing theories that could explain those patterns (Bryman and Bell 2015). The inductive approach usually starts with qualitative data to generate alternative or multiple views of the phenomenon under investigation to generate a theory or conceptual framework (Saunders et al. 2019).

An abductive approach is a third approach to theory development, which, in its real sense, is a combination of both deductive and inductive, i.e., it moves back and forth between theory and data (Suddaby 2006). In other words, abduction complements inductive and deductive logic or reasoning to generate research knowledge (Van Maanen et al. 2007). Abduction reasoning is probable, speculative and interpretative (Niiniluoto 1999). Abduction is also an interplay of doubt and belief, fuelling the creative creation of new knowledge as part of the research process (Mantere and Ketokivi 2013). Within interpretative research, the notion of abductive logic of enquiry enables the research process to speak to certain features of interpretative research, such as openness to the possibility of surprises during the research process (Saunders et al. 2019), followed by interpretations to work out a plausible theory to explain how this could have occurred (Wodak and Meyer 2009).

The abductive logic facilitated challenging the pre-understanding of conceptual anchors of this study (Alvesson and Kärreman 2007) and avoiding the tendency to fit empirical data to illustrate the pre-understanding of theory (Wodak 2004). As part of iterative–recursive abductive engagement between theoretical anchors and lived experience of HRAPs, answers to the research questions grew from lesser to higher specificity (and, hence, clarity) as the research process proceeded along the double hermeneutic (Cunliffe 2011; Mantere and Ketokivi 2013). This abductive approach also helped avoid the hasty closure of analytic possibilities through an iterative–recursive relationship, not only between sensemaking and sensegiving as theoretical concepts and empirical data but also between different sources of data (Schwartz-Shea and Yanow 2012).

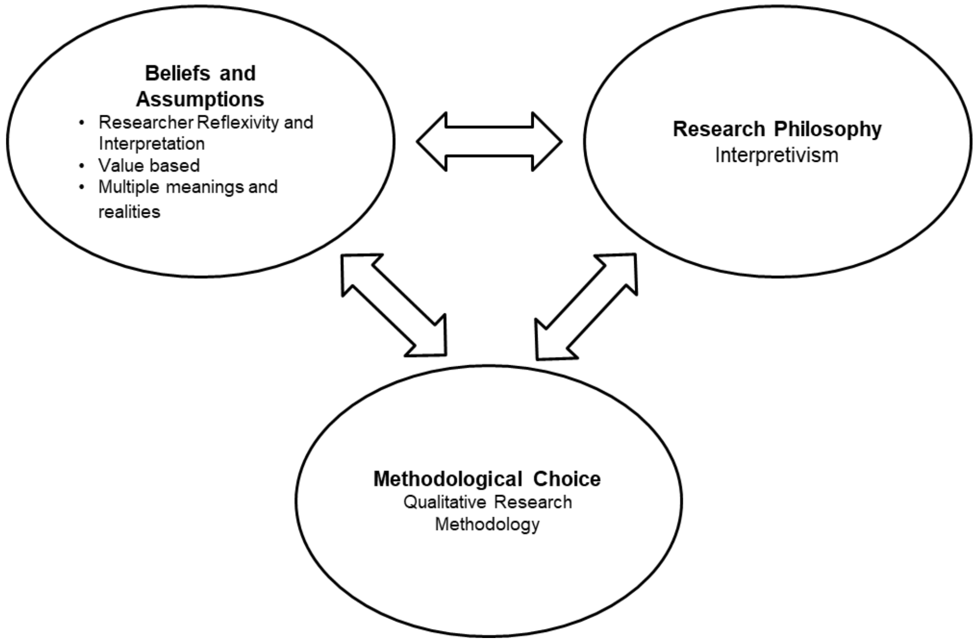


Figure 5-2: Research Philosophy and Design, Adopted from Saunders et al. (2019)

5.5 The Rationale for Adopting Qualitative Research Methodology

Against the backdrop of ontological and epistemological assumptions informing interpretive philosophy in the abductive research approach, it is time to peel off the third layer of the research onion, i.e., methodological choice. In this regard, this section outlines the plan for research design to answer the research questions while ensuring all vital elements are tied into the purpose of the research with a clear rationale for making such choices. As shown in Figure 5-2, qualitative research methodology suited the interpretative nature of the study, as it allowed immersion into the natural research setting to grasp the complexity and intricacy of the research phenomenon through more than one data collection method (Denzin 1997; Cunliffe and Karunanayake 2013; Hammersley and Atkinson 2019). The qualitative methodology provided interpretative insights by taking an emic rather than an etic perspective, a view from within that focused on HRAPs' cognitive, discursive and material practices, instead of an outsider (etic) view using academic categorisations and theorising (Cunliffe 2010).

Furthermore, the chosen qualitative research methodology was flexible and open to the iterative, recursive and adaptive nature of interpretative research with expectations of finding reality dynamic in all its messy contexts instead of being fixed, stable, numerical and logical (Schwartz-Shea and Yanow 2012). Due to the most unpredictable and complex nature of the research phenomenon, the researcher was prepared to adjust the research design to reveal HRAPs understanding, interpretation and reinterpretation and the associated complexities (Saunders et al. 2019). In addition to flexibility, methodological fitment and coherence to the research's purpose are essential considerations, as suggested by Edmondson and McManus (2007).

The study's objective is to capture the sensemaking and sensegiving of practitioners while they are enacting their analytics activities. The researcher decided to approach sensemaking and sensegiving as an accomplishment wherein the practitioners are entangled with others (people and tools) (Sandberg and Tsoukas 2011; Sandberg and Tsoukas 2020). The emphasis of the data collection remained on obtaining "rich accounts" (Weick 2007: 17) of HRAPs' sensemaking and sensegiving while carrying out analytical activities and routines. Thus, a data acquisition strategy was deployed to seek rich accounts of multiple layers of embedded contextualised and situated meanings about HRAPs' lived experiences. Rich accounts were obtained through extended semi-structured narratives of practice interviews conducted in two phases: conversations and documents. The two-phased semistructured narrative of practice interviews offered more opportunities to engage with the research participants and collect rich data through multiple vantage points (Saunders et al. 2019), reflecting inconsistencies and variations (if any) to produce a concerted account of the research phenomenon. Table 5-1 describes the data sources and their utilisation.

Table 5-1: Data Sources and Their Utilisation

Data Source	Type of Data	Use in Analysis
Narrative of Practice Interviews Phase 1 (semi-structured) – Each interview took between 60 and 90 minutes.	HRAPs were interviewed in detail to gather data on their meaning-making, giving practices, and related activities as part of their analytical work. Allowed participants to narrate reflective/reflexive accounts of their analytical work.	The researcher collected data regarding HRAPs' sensemaking and sensegiving experiences, context, and practices they were engaged in. The researcher gained a detailed understanding of the 'what' and 'how' of HRAPs' sensemaking, sensegiving, and reflexive practices and their underlying activities.
Narrative of Practice Interviews Phase 2 (semi-structured) Each interview took between 2 to 4 hours.	The researcher probed different dimensions for clarifications, meaning-making and critical reflections. First-hand view of HRAP entanglement with TTAs and consequences of these entanglements in shaping sensemaking and sensegiving practices A detailed record of conversations during phase 2. Field notes.	Got familiarisation with the analytical context, gained the trust of HRAPs, and clarified ambiguities and emerging data interpretations owing to new relfections or any other change that emerged from the ongoing project. Through a show-and-tell approach, the Researcher understood the material practices used in analytical work and linked them to the outcome of the analytical task. The researcher triangulated interpretations emerging from the documents and field notes.
Documents (640 pages)	Analytical briefings, reports, stakeholders' presentations and briefs and human resources dashboards/metrics	Support the triangulation of evidence from phase 1 and phase 2 of interview data. Support the reconstruction of the categories and themes during data analysis.

5.5.1 Extended Semi-structured Narrative of Practice Interviews

The framework shown in Figure 4-1 early on provided the context for exploring participants' experiences of the phenomenon under study. Besides the theory-driven areas of interest, the primary data source consisted of extended semi-structured narrative of practice interviews with individual practitioners to attend to research participants' complex lived experiences. The study adopted a two-phase interview process. First phase semi-structured interviews were instrumental in creating openings for an HRAPs narrative of practice to unfold, while also including questions informed by theory. As such, this method was particularly suited to the depth and complexity of the required qualitative data. In the second phase, follow-up interviews/conversations were based on details of the practice provided in the first phase. The choice of the second interaction phase was driven by the need to develop a deeper understanding of the sensemaking and sensegiving practices deployed by the research participants, particularly material practices, through prolonged engagement. The phased interview process allowed for the participant's engagement with segments of the interview, each progressively more structured.

For the first phase of the interviews, the study draws on a wealth of literature that suggests that narrative performance is an interpretative endeavour (Cunliffe and Coupland 2012) through which HRAPs can give an account of their sensemaking and sensegiving experience while doing HRA (Fenton and Langley 2011; Rouleau and Balogun 2011; Brown and Thompson 2013). Narratives are the "currency" of sensemaking (Boje 1991: 106). The application of narratives as a mode of understanding human exchanges in various domains of organisation studies ranges from individual sensemaking (Maclean et al. 2012; Vough et al. 2015) to collective sensemaking (Boje 1991; Weick 1995; Czarniawska 1998), constituting individual and collective identities (Brown 2006; Brown et al. 2008), power relations (Boje 1995; Smith and Keyton 2001), organisational change (Doolin 2003; Beech et al. 2009), strategy as practice (Rouleau 2010; Fenton and Langley 2011) and learning (Garud et al. 2011; Moore and Koning 2016).

The process of narrating involves linking, articulating, and integrating various bits and pieces of time, events, and social connections (De Luca Picione and Valsiner 2017). While keeping in mind the utility of narratives as a tool to simplify the narrator’s world and make sense of experience through appraising actions and meanings (Weick 1995; Cunliffe and Easterby-Smith 2004; Cunliffe and Coupland 2012), the narrative of practice in-depth semi-structured interview is preferred over other forms of interviews. HRAPs selected the project that they were undertaking currently. The researcher asked the HRAPs to narrate their experiences about their chosen project, its background and development, and what practices they engaged in as part of their sensemaking and sensegiving.

Thirty semi-structured narratives of practice interviews with 30 distinct informants were conducted in the first phase. During these interviews, HRAPs got an opportunity to share their experience while doing HRA in a particular context. When shared, abstracted and reified, the understandings of these narratives contributed to HRAPs sensemaking and sensegiving experience as they described it. These narratives produced relatively more temporally sequential and meaningful accounts by narrating past, present or future experiences of sensemaking and sensegiving of HRA (Squire 2008). Narratives of practice interviews allowed HRAPs to find meaning in their experience after living it retrospectively (Miller 2015) and provided an opportunity to narrate the experience from within through reflection and reflexivity (Cunliffe 2002).

From a forward-looking perspective, i.e., prospectively, HRAPs also narrated their interpretation of the projected/predicted future regarding findings of HRA (De Luca Picione and Valsiner 2017). HRAP memory interactions with future expectations provided an opportunity to construct a threefold present (the present of the past, the present of the present, and the present of the future) in the present moment (Ricoeur 1984). This memory and expectation together broaden HRAPs' awareness in (and of) the experience regarding what they were doing and how they related to it through reflection and reflexivity (Tsoukas and Hatch 2001).

The study adopted a semi-structured interview format to achieve the desired level of information and meaningfulness through a dialogue (Atkinson and Delamont 2006; Squire 2008). The interview protocol for Phase 1 is given in Appendix D. The interviews followed a hybrid approach (Hollway and Jefferson 2008) wherein the researcher embraced the possibility of having narrative-eliciting questions alongside open-ended and follow-up questions based on respondents' narration. After explaining the purpose of the interview, the participants were asked to describe their experiences and thoughts about executing the current analytical project of their choice. This single question provoked and elicited the complete narrative without interruption from the researcher's side.

The opening narration was followed by follow-up, open-ended, provoking questions exploring the different areas from the initial narration. In order to get research participants to further expand on their initial responses, the researcher asked them to tell more about that issue. The researcher encouraged informants to wander freely in their answers to the first question to keep the conversation as open as possible by allowing participants to reflect and express themselves (Denzin and Lincoln 2018). Only when there was a noticeable silence or an end to an HRAP's response did the researcher step in and ask a further return to the narrative question. The intention behind this interview structure was to acquire an uninterrupted account of HRAP sensemaking and sensegiving. These narrative-eliciting questions facilitated the acquisition of more reliable data (Wengraf 2006). All interviews were digitally recorded and transcribed immediately after the interviews. A sample interview transcript is given in Appendix E.

It is worth mentioning that the researcher remained in telephonic contact with the research participants to coordinate the follow-up interview in the second phase. This resulted in 30 serial interviews as part of the second phase, where the researcher required more clarification after going through the transcript or where participants wanted to share additional experiences owing to new reflections or any other change that emerged from the ongoing project. The researcher used a show-and-tell approach that encouraged staying, pausing, and probing deeply into questions of how and why in ways HRAPs experience their sensemaking and sensegiving practices while executing their project. These conversations lasted two to four hours, and handwritten field notes were taken, which we reread and edited immediately after each interview. Despite their busy schedules, the participants were extraordinarily generous with their time and patience.

The researcher actively drove and guided the conversations by engaging in an interactive dialogue with the participants. These conversations enhanced participants' stories by rendering them clearer, fuller, and more concrete. Many participants also showed internal documents they referred to during the conversations. The participants' descriptions were occasionally disjointed in flux between these two phases of interactions. Thus, as they told their stories, the researchers asked them to clarify and elaborate points so that the researcher could better understand the many nuances, multiple connections, and temporal contexts. The researcher probed different dimensions of experiences for clarification, meaning-making, and critical reflection. In this way, the researcher gained further insights into how HRAPs approached briefings/presentations and the tools used to support their analytical efforts. HRAP sensemaking and sensegiving practices probed during the sessions spontaneously emerged in response to questions during the interview. The researcher sought to understand how analysts prepared themselves to conduct briefings, their experience responding to various stakeholders' questions, and any adjustments to their practices and approach after the briefing and sessions.

The second phase helped the researcher to explore that participants communicate beyond words about their material practices through show-and-tell (Crawford et al. 2021) using visual and tactile mediums to support their narratives rather than simply talking. During this phase, the researcher intended to understand how TTAs shape sensemaking and sensegivng practice while performing various actions through conversations. Generating data from the perceived affordance of TTAs allowed the researcher to capture the richness of the show-and-tell experience. Witnessing and inquiring about the sensemaking and sensegiving experiences as they happened through TTAs was fundamental to understanding the analytics practice. Practitioners not only perceived the affordance of TTAs but also engaged their imaginations to put into practice these TTAs to complement their sensemaking and sensegiving outcomes. This show and tell experience gave the researcher a first-hand view of HRAP's entanglement with TTAs and the consequences of these entangled patterns in shaping sensemaking and sensegiving, i.e., how an HRAP’s one action conditions subsequent actions (Hultin 2019). The researcher also fed interpretations of HRAP’s accounts back to him/her to strengthen the researcher’s interpretations and check against alternative interpretations. See Appendix F for sample extracts of the conversations.

Overall, the objective of the second phase was to have conversations about sensemaking, sensegiving and material practices and their associated activities, besides gaining their trust and clarifying ambiguities from emerging data interpretations. The field notes from these interview sessions also formed a vital source of data as they provided detailed descriptions of the researcher’s interactions in the field (Sarah 2013). The second phase generated four types of data offering clarification about the situations (Delbridge and Kirkpatrick 1994), i.e. data from primary observations included what happened or what the research participants said. Secondary observation included researcher comments or clarifications requested, experiential data regarding the participants and researcher's feelings, perceptions and thought processes, and contextual data outlining the context and research settings. These observations produced insights the researcher followed up during conversations.

5.5.2 Document Analysis

The researcher collected 640 pages of supporting documents to support triangulation and enhance reliability across all HRAP projects. This included internal email communications, HRA project documents and presentations, briefings and meeting minutes that helped the researcher understand how HRAPs have built a storyline around HRA. Additionally, these documents provided helpful insight into the organisational context as they revealed the background to issues under review by the HRAPs and the business context in which they have been addressed through HRA. Analysis of these documents supported the context understanding, HR and business strategy and HRA outcomes. Also, document data was used to integrate evidence from interviews and support the exposure and construction of HRAP assumptions in a context.

5.6 Data Collection Plan

The data collection plan puts into perspective the research context, followed by a detailed discussion of the sampling approach alongside the rationale for choosing the appropriate sampling techniques for data collection to best answer the research questions.

5.6.1 Research Context

The study was undertaken in the UAE, where the country's leadership aims to create a knowledge-based economy as UAE Vision 2030 listed skilled human capital as the first of seven strategic enablers. This agenda prioritises HR for both the public and the private sectors. At the same time, the organisations consider HRM in the UAE to be complex due to the increasing pressures for localisation and evolving UAE labour laws and regulations. As per the localisation plans, organisations are to keep employed a certain percentage of the local workforce as a mandatory requirement, contributing to the national HRM agenda (Sidani and Al Ariss 2014). Other significant complexities are an evolving educational system, the massive reliance on an expatriate workforce, a culturally diverse labour pool, and the challenges of engaging and retaining the workforce.

Like many other management practices, HR practices in the UAE come from the West (Sidani and Al Ariss 2014). In this regard, progressive organisations in the public and private sectors balance local adoption and global assimilation. In managing and developing people, HRA is vital to effectively manage workforce localisation and diversity, achieving organisational and national goals in the UAE by considering UAE culture and labour market requirements (Sidani and Al Ariss 2014). HRA is considered an essential tool in the UAE, mainly by multinational private companies and the more progressive government enterprises (Schmidt et al. 2013). Multinationals can practise HRA for the most part due to the strong support and guidelines from their corporate offices based in the West, where HRA is comparatively more evolved (Hartmann et al. 2010; Mäkelä et al. 2010). More progressive local organisations have adopted HRA practices from the West with local responsiveness (Hartmann et al. 2010; Schuler et al. 2011; Schmidt et al. 2013). It would be interesting to explore the emerging role of HRAPs in UAE organisations amidst the complexities highlighted above to generate actionable insights.

5.6.2 Sampling Approach

In research methodology literature, sampling approaches fall into two categories (Creswell 2013). The first category is probability or representative sampling, generally associated with quantitative studies where inferences are required from the sample regarding the population to be studied to answer the research questions (Saunders et al. 2019). The second sampling approach is non-probability sampling, generally employed in qualitative studies to select units, such as people, organisations or documents, with direct reference to the research questions (Bryman and Bell 2015). Non-probability sampling is also described as purposive sampling (Saunders et al. 2019) or purposeful sampling (Creswell 2013). In terms of sampling strategy, non-probability or purposeful sampling (criterion-related) suited the qualitative interpretative stance of this research as the objective was to collect data from information-rich people with the required level of experience with the research phenomenon, as opposed to generating a representative sample (Creswell 2013; Saunders et al. 2019). Thus, the sample was driven by the research's objective when recruiting HRAPs as research participants due to their relevance to the research questions (Bryman and Bell 2015).

The study used snowballing to ensure the sample contained knowledgeable research participants (Saunders et al. 2019). Such an approach is another form of purposive sampling to help include information-rich research participants in the sampling frame per the criteria laid down (Creswell 2013). While some scholars, e.g., Bryman and Bell (2015), have stated concerns that snowball sampling is not likely to represent the population, the population representation condition was irrelevant for this study. As stated above, the research aim was not to generalise from the sample but to gain a situated and contextualised understanding of the research phenomenon through information-rich research participants. Thus, snowball sampling did not represent a risk to the study's rigour and trustworthiness (reliability and validity).

5.6.3 Sample Size

In addition to participants meeting the criteria for sample selection, the sampling approach also involved arriving at the right sample size (Saunders et al. 2019). In the case of narrative interviews, researchers have suggested a smaller sample size (Squire 2008). It allows in-depth access to the reality under investigation with an objective of generalisation to theory rather than the population (Saunders et al. 2019). In the case of quantitative research, the sample is required to be statistically representative of the research population to generalise the results. In contrast, qualitative research aims to provide an in-depth understanding of the social world as seen through the perspective of research participants as the meaning develops from the data. Statistical inference is not the objective in qualitative research (King and Horrocks 2010).

However, a specific number for the ideal sample size varies between studies as researchers have suggested various numbers. For instance, Saunders et al. (2019) recommend five to 25 participants for semi-structured, in-depth interviews. In their work on qualitative research, Englander et al. (2012) also suggested selecting between 5 and 20 participants. When it is difficult to determine the sample size at the outset of the study, researchers have recommended an approach where the sample size is not set at the beginning; instead, the size is determined as the research progresses until data saturation is reached (Saunders et al. 2019). Previous studies where narratives are applied to study sensemaking of the organisational phenomenon collected their empirical data from 16 (Maclean et al. 2012), 38 (Konlechner et al. 2018), 26 (Brown et al. 2008) and 20 (Järvenpää and Hänninen 2018) participants.

Therefore, it seems that there are no specific criteria to define the sample size, and the right sample size depends on the logical relationship between the sample selection technique and the purpose of the study (Creswell 2013). The researcher continued recruiting research participants until data reached theoretical saturation and additional interviews ceased to doubt existing or disclose new categories or relationships between emerging themes (Saunders et al. 2019). Against the backdrop, a sample size of 30 participants was suitable for exploring the research phenomenon in-depth.

5.6.4 Identification of and Access to Research Participants

Within the domain of non-probability sampling, the next step is to identify research participants based on specific criteria dictated by the purpose of the research (Creswell 2013). Before identifying research participants, an important step is to clarify the selection criteria for exclusion and inclusion in the sample (Bryman and Bell 2015). The location of participants at a single site or multiple sites is of secondary importance; the prime condition is to have participants who can give an account of their experience (King and Horrocks 2010; Creswell 2013).

Thus, in the present study, the most critical question when selecting participants was whether they had the required experience the research sought (Englander et al. 2012). As the study focused on HRAPs' experience of making and giving sense while performing HRA tasks/projects, the minimum criterion was five years of HRA experience. This experience level was essential for patent and transparent exploration of the research phenomenon (Pettigrew 1990). The overall aim was to recruit research participants with adequate HRA experience. The assumption was that this would maximise the likelihood of exploring the variation and commonalities of experiences. The overview of research participants' analytical projects/tasks and organisations is outlined in Table 5-2.

In addition to deciding on research participants, an important consideration was gaining access to research participants ethically and sensitively (Sarah 2013; Bryman and Bell 2015; Saunders et al. 2019). The access issue in this study's context warranted a well-thought-out plan and execution (Pettigrew 1990). Access involves two facets: first, choosing a suitable approach to gain access to potential participants, and second, the information that needs to be provided to HRAPs to help them decide to participate (King and Horrocks 2010). As an HR practitioner, the researcher reached out to LinkedIn contacts currently performing the HRA function within companies in the UAE. Reaching out to such contacts facilitated the recruitment of more suitable research participants. All the research participants received an email explaining the purpose of the study and the confidentiality and anonymity conditions for their participation (King and Horrocks 2010). Research participants responding to this invitation were contacted via telephone to convey further details about the research project. At the same time, efforts were made to answer any queries from the research participants regarding their participation and withdrawal rights. These telephone conversations also validated that the research participants met the sample criterion relevant to the research.

Table 5-2: Overview of Practitioners, Analytics Tasks/Projects and Organisations

S.no	Job Titles	Analytical Project/Task	Organisation	Project/Task Details
1	Manager Analytics and Resource Planning	Human Resources Planning	Contact Centre	Respondent 1 works for a call centre that employs over 1000 agents central to delivering a high-quality customer experience. He was tasked to develop a workforce planning tool to help streamline forecasting and scheduling processes so line managers and HR can now easily adjust or run what-if scenarios for upcoming events promptly. Additionally, managers can constantly monitor volume and schedules to ensure they have enough agents to handle contacts while avoiding idle agents and driving up labour costs.

2	Human Resources Analytics Manager	Optimum Human Resources Function Staffing Levels	Diversified Group of Companies	Respondent 2 works for a sizeable, diversified group of companies in the United Arab Emirates as Head of HR Analytics. The Director of Human Resources tasked respondent 2 to examine the group's manning levels in the HR function. There was a broader question in front of management. Does the organisation have the correct number of people in different HR work streams, such as HR Business Partners, HR Centres of Excellence and Shared Services? The exercise required respondent 2 to establish if the functions within HR were overstaffed in their roles and job families and was also an opportunity to identify understaffed functions.
3	Senior Analyst Workforce Planning	Tactical Workforce Planning and Scheduling	International Airport	Respondent 3 was tasked with developing the tactical workforce planning and scheduling approach to satisfy the daily operating requirements of skilled workers at all organisational levels, including senior management, managers and staff in various airport operational departments. The essential elements to be considered were operational factors such as seasons, flight schedules, staffing factors, and personnel rostering to forecast the demand for skilled staff.
4	Manager Human Resources Analytics	Analysis of Employee Engagement Survey Results	Private Hospital Chain	Respondent 4 works for a newly established private hospital chain, keen to build, support, and brand employee value propositions that enable the organisation to attract and retain talent. Management asked Manager Human Resources Analytics to launch an employee engagement survey to measure where their current culture stands and offer insights that enable managers to make informed decisions as part of driving the culture through data insights.
5	Manager HR Analytics	Hybrid Working Model for Staff	Healthcare Research Company	Respondent 5 works for a healthcare research company involved in vaccine development in the pharma space. The company was experiencing significant pressure to produce vaccines on a fast-track basis. As COVID-19 struck, the company shifted most of their workers to work remotely for some time and then gradually started recalling some of the employees back to work in the office and eventually ended up with a hybrid working model where some of the staff could work from home. Management wanted to continue with this hybrid working model. After implementing this work pattern change, management was keen to analyse and manage employees' reactions to this change, as not everyone might have the same ability to cope with this change.
6	Director of Analytics and Reporting	Workforce Planning	Teaching Hospital	Respondent 6 is the Head of workforce analytics for the teaching hospital, employing over 10,000 in the United Arab Emirates. During COVID-19, hospitals stopped performing elective procedures and other research-related activities as part of government directives. This immediate operational shift impacted the workforce as most of the supporting staff were required to be either laid off or sent on furlough, keeping in mind the needs of the business. When hospital operations resumed, these staff were recalled based on the operational requirements. Respondent 6 was expected to provide analytical support to the business to help make informed decisions.

7	Head of Human Resources Analytics	Measuring Employee Engagement	Bank	Respondent 7, as part of his HR analytics strategy, was keen to provide data and insights that will inform intelligent decision-making and transform HR. The pandemic ushered in new demand from business managers for timely employee engagement data, bringing new opportunities for respondent 7 to advise management. Respondent 7 decided to build an employee engagement dashboard to offer data and insights that are easy to understand, enabling managers to spot emerging workplace issues or trends quickly to improve business performance.
8	Director of People Analytics and Compensation	Implementing a Human Resources Analytics Strategy	Diversified Group of Companies	Respondent 8 is leading the HR analytics portfolio, which is mandated to put its efforts into the right strategic priorities and constantly review its portfolio initiatives' impact and value add. Through developing and implementing an HR analytics strategy, she sought out the required investment that needed to be made into people data and technologies. She was tasked to continue improving the capabilities around data governance, data quality management, data privacy management and ensuring that the organisation has the correct data and can access the data faster and in better quality.
9	Director of Human Resources Analytics	Analysing Employee Turnover	Contact Centre	Respondent 9 was working on a project that involved collecting, analysing, and reporting employee turnover data by breaking turnover data down and getting insights into what turnover looks like for different employee segments and categories. Based on the information gained from the analysis, he prescribed targeted retention strategies that will help keep top talent on board. Getting to the root causes of turnover and preventing unwanted turnover helped reduce the costs associated with turnovers, like recruiting costs and loss of productivity.
10	Organisation Analytics Manager	Employee Engagement & Action Planning	Construction Equipment Manufacturing	Respondent 10 was entrusted with using employee surveys supported by scientific evidence to gather precise information that would assist in prioritising the best programs and demonstrate impact. Give the company's leaders the necessary tools to engage and keep their workforce. Respondent 10 wanted to give executives the skills to increase engagement and retention through logical dashboards and comprehend staff sentiment using comment analysis. This supported the managers to drive meaningful, long-lasting change by acting where it matters the most and pinpointing, prioritising, and taking action on the highest impact areas.
11	Head of Workforce Analytics	Profiling Relationship Managers	Financial Institution	Respondent 11 works for a large financial services institution employing relationship managers to manage relationships with small to medium size enterprises. The analytical task respondent 11 got to work with was to help management identify the attributes of the successful relationship manager that would inform recruitment decisions going forward. As he moved into the project, the scope was revised to determine the optimised model to have a combination of successful relationship managers.

12	Workforce Analytics Manager	Flight Crew Scheduling Model	Airline	Respondent 12 is working for an airline in the United Arab Emirates. Crew scheduling has always been challenging for the airline. Every morning crew scheduling team must make assignments for the next day, so they do this on a rolling basis. Crew scheduling chooses between categories of crew members, such as reserves or premium paid bidders, having a varied financial impact. Respondent 12 was tasked to help the business operation with this problem by developing a flight crew scheduling model so that the scheduling team could make informed decisions about the crew scheduling and help the airline reduce the crew operating cost.
13	Director of People Analytics and Compensation	Analysing Recruitment Performance	Global Home Furnishing Brand	For respondent 13, the analytics project involved recruitment data analysis in collecting, organising, and interpreting data related to recruitment activities and outcomes to help optimise recruitment activities, improve candidate experience, and evaluate return on investment. Respondent 13 devised recruitment metrics to track hiring success, optimise the process, and help evaluate the recruiting process to make improvements.
14	Senior Manager Human Resources Analytics	Construction Project Staffing Model	Civil Construction Company	Respondent 14 works for a civil construction company executing a large-scale construction project and employing over 10,000 employees. The workers are considered the biggest asset for a project and can give the business a competitive edge and help the company grow its bottom line. Within the lifecycle of a large-scale infrastructure or construction project, staffing needs fluctuate, so the company requires a robust project staffing model to manage staffing needs for multiple projects running simultaneously with the flexibility to ramp up and down quickly without significantly interrupting the operations.
15	Head of Human Resources Analytics	Reducing Voluntary Employee Turnover	Retail Supermarket Chain	Respondent 15 works for a supermarket chain that is losing money because of a rise in voluntary staff turnover. Entry-level retail roles appeal to job seekers since they do not call for specialised training or high levels of education. This analytics study investigated the causes of the high voluntary turnover across the stores. The research provided suggestions for store managers on handling talent retention and turnover issues and creating efficient plans to minimise the high turnover rates.
16	Senior Manager Analytics	Aligning Compensation Structure	Construction Equipment Trading	Respondent 16 was tasked to undertake a compensation analysis to review how well an organisation's current pay structure, policies and practices align with its compensation strategy to attract and retain the best talent. It also provides insight into external competitiveness, internal equity, and fairness. The insights from the analysis also informed future compensation and talent strategies.
17	People Analytics Manager	Building Talent Analytics for Talent Management & Succession Planning	Global Humanitarian Organisation	Respondent 17 is working for a global humanitarian organisation. Three years back organisation launched its first-ever global strategy. One of the critical success factors and enablers for that global business strategy was to support it through a data-driven integrated talent management strategy. Respondent 17 and his team were expected to give the correct information and context through talent analytics, enabling talent management and succession planning.
18	Senior Manager Analytics	Workforce Forecast and Planning	Food Processing	Food and beverage may be the most challenging industry for scheduling and forecasting. Consumer preferences, raw material availability, changing regulations, and product specifications can hamstring even the smoothest operation. Respondent 18 is

				working on the scheduling model by leveraging various tools and techniques, such as statistical analysis, machine learning and predictive analytics, to help managers identify patterns in data to make accurate demand forecasts and plan the workforce accordingly.
19	Director of Analytics and Digitalisation	Diversity and Inclusion Metrics	Insurance Company	Respondent 19 is working for the insurance company, which embarked on creating a diverse and inclusive workforce three years ago, and substantial resources have been spent on diversity initiatives. The primary question in front of senior management is to know whether the workforce is diverse or inclusive enough and understand the potential impact of diversity and inclusive initiatives to decide if they are worth the effort and what more needs to be done to achieve the desired results. In order to measure the metrics, respondent 19 decided to use an analytics or business intelligence platform with a custom dashboard that allows businesses not only to collect the relevant data but also to visualise it and extract actionable insights easily.
20	Workforce Analytics Manager	Predicting Employee Turnover	Group of Companies	In order to reduce the lead time for hiring staff, respondent 20 was responsible for developing a methodology for predicting employee attrition at the organisational and departmental levels. Based on the monthly turnover data from the previous 10 years, series modelling techniques were utilised to select the best models for accurate employee turnover prediction. The forecasting tool was intended to help HR develop retention tactics to lower turnover rates.
21	People Analytics Manager	Examining the Impact of New Compensation Structure on Staff	Automotive Trading Company	A compensation effect analysis was carried out by Respondent 21 to demonstrate how pay policies, such as pay philosophies and strategies, positioning, base pay, and incentive design, are being implemented in terms of financial costs and returns in addition to organisational impact. The analysis also identified opportunities, emerging competitive issues and market positioning regarding compensation. Thanks to this analysis, the organisation could comprehend the effects of their remuneration decisions.
22	Senior Manager Human Resouces Analytics	Analysing Causes of Employee Turnover	Electronics Trading Company	Respondent 22 was tasked to analyse employee turnover through workforce analytics to dig deep into what is causing staff to leave. The project focused on understanding resignation drivers and their correlations with resignation to prescribe the appropriate intervention to help reduce employee turnover in critical roles.
23	Director of Analytics	Making a case for HR Initiatives – Employee lifecycle	Food Processing Company	This Food processing company used a traditional HR model with much paper-pushing and bureaucracy when executing the transactional activities in the employee life cycle. The company did not have an easy way to quickly aggregate the data needed to answer questions or understand the gaps in managing transactional activities. The Director of Analytics undertook the project to find the answers to questions such as: How efficiently are they operating? Where are the gaps in how they are serving their staff?
24	Head of Data Science	Drivers Forecasting Model	Logistic Company	Respondent 24 leads data science efforts for a regional logistics company in the MENA region. The company deliver orders from point A to point B for e-commerce players in the market. Respondent 24 was tasked to develop a driver forecast model that can forecast the workload per warehouse or city in each operated country based on the seasonality factors and

				then accordingly project the number of drivers that will be required.
25	Human Resources Analytics Manager	Project Staffing Model	Construction Company	A prominent civil construction company struggled with time-consuming coordination between different functions for project staffing as there was no real-time visibility of staff project allocations. Respondent 25 worked on a model to understand staffing needs with a real-time view of various functions on a specific project, along with subcontractors with a shared situational picture. Then, analyse business impact with accurate staffing data and create business forecasts with real-time data-based scenarios.
26	Human Resource Information Manager	Predicting Employee Turnover	Diversified Group of Companies	This diversified group of companies employ over 10,000 people. To help reduce turnover, respondent 26 performed a predicted analysis to understand the likely future employee turnover. Respondent 26 dug deeper to explore the conditions before the exit by analysing over 23 variables, such as performance ratings, the time spent in a given role, and the size of an employee's team. Based on as little as ten variables, the resulting predictive analytics model allowed the organisation to precisely anticipate how likely an employee is to leave the company in the upcoming year.
27	Workforce Reporting Manager	Measuring the Effectiveness of Incentive Scheme	Restaurant Chain	Respondent 27 is working on an analytical project to measure the effectiveness of an incentive program introduced in the business almost 2 years back. He focused on understanding how it influences the restaurant team's behaviours, actions and engagement. Furthermore, it evaluates how relevant and appealing incentives are and how they align with the strategic priorities and objectives.
28	Head of Workforce Analytics	Workforce Planning	Global Manufacturing Company	Respondent 28 is employed by a company that creates power distribution systems and specialises in medium-voltage switchgear with high performance for utility, industrial, and commercial applications. The company has offices and production facilities in Saudi Arabia, the United Arab Emirates, South Africa, Malaysia, the United Arab Emirates, India, and Thailand. Respondent 28 wanted to reshape the way the organisation was looking at strategic workforce planning and develop a workforce planning model to operate during and post-pandemic context, not so much approaching it from a pure methodology standpoint but trying to blend it into a business planning exercise.
29	Senior Manager Human Resources Analytics	Implementing Human Resources Dashboard	FMCG Company	Respondent 29 was building an HR dashboard to track and help the HR department be more proactive and effectively manage new challenges in an ever-changing environment and improve organisational communication and decision-making. The dashboards summarise important metrics and determine how specific metrics in employee turnover, engagement, and diversity correlate for stakeholders to see patterns and develop strategies around them.

30	Human Resources Analytics Manager	Managing Employee Absenteeism	Facility Management Company	Respondent 30 worked on a project to help the Field Managers in a facility management company tackle employee absence, as absenteeism in this company has risen above the benchmark levels. Respondent 23 formulated hypotheses and tested and validated them. The insights from the analysis were communicated to managers to help improve their understanding of the causes of absenteeism and reach effective means of reducing it.

5.7 Data Analysis

According to Freeman (2004), searching for a valid interpretative frame is crucial for the interpretative approach to qualitative data originating from multiple sources, as there can be multiple valid interpretations. It is imperative to choose a data analysis approach where data would retain its meaning within the context as experienced by HRAPs (Andrews et al. 2013). The object of analysis is the critical parameter, which can provide substantial differentiation when deciding on the analytical approach (De Fina and Georgakopoulou 2012). The focus of the study remained on how HRAPs give an account of their experience of what they are doing and how they are doing it while making and giving sense through cognitive-discursive and material practices (Beuthin 2014; Slembrouck 2015).

In this research, the mode of analysis nevertheless implied a formidable commitment to an interpretative philosophy with double hermeneutics as a mode of interpretation with back and forth between theory and empirical data in an abductive manner (Cunliffe 2011). The most suited analytical approach is the one that can potentially deal with the conceptual structure of the narrated text, document analysis and field notes, the way HRAPs conceive their experiences as narrators with a focus on the content of narratives rather than the structure or the social action achieved through narratives (Riessman 2008). In other words, data analysis focused on finding meanings through interpreting interview transcripts, document analyses and field notes to understand better the experience narrated (Riessman 2008; Kim 2016).

The primary focus of the analytical strategy was not on getting the facts; instead, the objective was to analyse and articulate multiple experiences to understand the nuances of the observed reality (Saunders et al. 2019). Thus, it was critical to avoid rushing to a conclusion on interpretative patterns; instead, conscious efforts were required to look for tensions in the emerging experiences of reality (Schwartz-Shea and Yanow 2012). The analytical process ensured continuous testing and reassessing initial expectations, helping reveal the inconsistencies arising from intertextuality and silences in the data, i.e., what is not being heard while collecting data or observed during the analysis (Schwartz-Shea and Yanow 2012). An analytical approach drew influence from the process of flirtation with the data, as Kim (2016) suggested, to allow space for curiosity and surprise with different ways of knowing without being influenced by personal wishes. Flirting with data hinged on a hermeneutics of restoration (faith), i.e. the narrative data shared by research participants is authentic and meaningful from the perspective of research participants' subjective experience (Josselson 2004).

5.7.1 Thematic Approach

Thematic analysis of data generated through the extended semi-structured narrative of practice interviews is quite common in research on sensemaking and sensegiving (Riessman 2008; Rouleau 2010; Bamberg 2012; Kelley and Bisel 2014; Maclean et al. 2014). The thematic analysis allowed the discovery of common themes and salient constructs based on the paradigmatic mode of analysis while preserving the credibility and dependability of the data collected (Saunders et al. 2019). Humans organise their experiences as ordered and consistent while adhering to common categories, characteristics and concepts (Kim 2016), which repeatedly appear in data, and their relationships can be fitted into larger patterns and themes (Riessman 2008). More specifically, the thematic approach facilitated an analysis of how HRAPs represent their sensemaking and sensegiving practices while allowing similarities and contrasts in the data analysis to emerge (Bryman and Bell 2015).

From an analytical perspective, this helped place emphasis not only on the content (what) of the unfolding experience but also on the "how" and “why” of the sensemaking experience, which means how and why it was accomplished (Tsoukas 2014). The analytical approach also included looking for intertextual links across and within data sources (Brandwein 2006). The intertextual analysis led to the thickness of interpretation and involved looking for the dimensionality, ambiguity and possible contradictions that might have surfaced during analysis while remaining open to the possibility of consensus and agreement without presuming or privileging it. (Schwartz-Shea and Yanow 2012).

The thematic data analysis followed abductive theory-building principles, where the researcher moved back and forth between theoretical anchors to generate an emerging framework (Kramer and Crespy 2011). The data analysis process involved iterative coding cycles and shifting back and forth between the data, emerging themes and the literature as opposed to being linear. The researcher drew primarily from the interview transcripts (160,131 words), field notes and document analysis data (640 pages) to help flesh out developing themes. During the preliminary analysis stage, the researcher listened to the interview recording while at the same time reading the transcript and the notes. This process enabled a thorough understanding of the interview's content. As there were multiple data collection sources, the analytical approach utilised an approach commonly referred to as constant comparison, wherein data was collected and analysed collaboratively (Charmaz 2006; Sonenshein 2010; Kelley and Bisel 2014). Within constant comparison, the researcher kept analysing the data cross-sectionally across analysts’ narratives, filed notes and document analysis through emerging concepts and variations (Sonenshein 2010).

5.7.2 Stepwise Data Analysis

The analysis followed a stepwise approach to ensure that findings were valid, rigorous and well-supported, as Figure 5-3 outlined. Multiple data sources also enhanced the validity of interpretations by triangulating from different data sources during all three steps of the coding process. It is worth mentioning that these analytical steps did not form a linear process only but instead allowed the process to be interrelated and simultaneous. A pattern of themes slowly emerged while these steps were executed. MAXQDA 2020 software was used to support the data analysis process. The transcribed interview data and the audio files were uploaded to the software. The software made the organisation and data preparation efficient and effective, as suggested by Bryman and Bell (2015). MAXQDA 2020 software did not analyse qualitative data per se. Instead, it aided in organising textual data by providing a structured and easily retrievable means of data management.

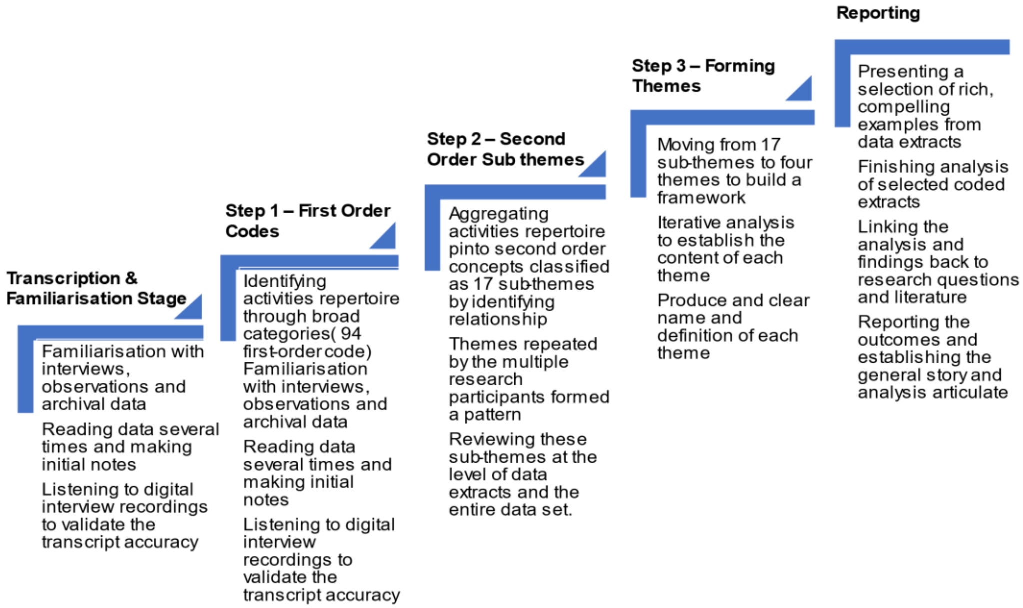


Figure 5-3: Stepwise Thematic Analysis Process

5.7.2.1 Step one: Identifying activities repertoire through broad categories (first-order codes)

The first step in data analysis involved identifying initial broad categories as first-order concepts to get general insights into patterns of sensemaking and sensegiving described by participants within each extended narrative of practice interview, and document analysis data. The researcher analysed the data within and across research participants and data sources to obtain common pattern evidence through multiple lenses. This step consisted of the sorting process of treating the first example, which was considered revelatory from the data, as a first-order code as a category and then assessing and comparing the second example to the first. It was added to the first-order code if it matched, but if it did not match, it formed a new category (Walker and Myrick 2006; Kramer and Crespy 2011; Bryman and Bell 2015). A category was formed from coded excerpts, examples and terms (either used by participants, from theory or evolved as part of similar research). When searching for a category, the focus was on repetition, i.e., topics or categories that appeared repeatedly, indigenous and unfamiliar typologies used by the participants (Andrews et al. 2013). Simultaneously, the first step included data reduction and the removal of transcript segments irrelevant to research questions (Lindlof and Taylor 2011).

The researcher developed a data structure based on these categories and coded the data into 94 first-order codes. These codes reflected the research participants' actions/activities and language and unveiled key elements of their meaning-making and giving practice. This first-order coding also involved recognising the relationship among categories through constant comparison of examples to examples and categories to categories, which may result in the development of new categories (Bryman and Bell 2015). The first-order coding process continued until conceptual saturation was reached, i.e. new categories could not be located in the empirical data (Saunders et al. 2019). Finally, only those codes were retained that were supported across the research participants and data sources.

When reflecting on these transcripts, it was immediately apparent that HRAPs found their respective projects/cases and contexts challenging. In the first step, the researcher utilised the cognitive, discursive and material properties of sensemaking and sensegiving to understand the meaning-making and giving process. Drawing on data, the researcher pulled quotes from the data related to what kinds of practices HRAPs engaged in while making and giving sense. Simultaneously, the researcher investigated how and through which activities these practices were put into practice while the HRAPs performed their roles. These first-order categories were identified to facilitate identifying underlying activities that were put into practice. The researcher also noticed repeated elements of analysts' reflexivity as part of their sensemaking and sensegiving experience. The researcher coded these texts by identifying and marking parts that included reflexive talk about lived experiences (utterances) of project-based work.

5.7.2.2 Step two: Aggregating activities repertoire into second-order concepts (sub-themes)

The researcher aggregated first-order concepts into broader second-order concepts (sub-themes) in the second coding step. The researcher sought links between and among the first-order codes and categories identified in the first step, which facilitated classifying them into 17 second-order concepts. The second coding step involved using axial coding in MXQDA 2020 to identify relationships among the first-order codes to develop second-order codes. The MXQDA software helped to sort the logic between the relationships uncovered during the analysis. The second-order codes were identified by searching for keywords, their underlying meaning and the context within which they were embedded. As themes and relationships emerged, the data analysis process in this step looked for similarities, patterns and differences among the data, and, while doing so, disconfirmed relationships were either refined, extended or discarded. Themes repeated by multiple research participants indicated patterns (Saunders et al. 2019).

A core aspect of the thematic analysis was that it allowed concepts and relationships to emerge from the data. In addition to emerging data, the thematic analysis was driven by sensemaking and sensegiving literature, which aided in unpacking the dynamics of HRAPs' experience of making and giving sense. For instance, it was recognised that data analytics involves the reflexive use of cues and interpretative patterns, and analysts' reflexivity can help them build analytical capability (Calvard 2016). However, the literature does not explain how and through which activities reflexivity is practised when executing analytical tasks.

5.7.2.3 Step three: Moving from sub-themes to themes to build a framework

In the final step, the researcher combined the 17 sub-themes into a higher theoretical perspective and derived five overarching aggregate themes. These themes came together as a well-defined framework that helped confirm the concepts, verified relationships and patterns, and enriched the understanding of how HRAPs executed sensemaking and sensegiving practices and their underlying activities. The researcher looked for similar concepts and relationships across the data, comparing the sub-themes generated in step two. Similar themes were grouped into aggregate dimensions that served as the basis of the emerging framework.

The researcher labelled these five themes, i.e. ‘pursuing coherence’, ‘setting up and delivering conversations’, ‘performing reflexive conversations’, ‘sensible enactment through material support’ and ‘navigating paradoxes’, either by capturing the content at a higher level of abstraction or by relating it to existing literature that labelled highly similar concepts. The thematic approach ensured that emerging themes and their structuring were appropriate to the narrative of practice contents and organisation (Bamberg 2012). These themes were also analysed by linking contents to their themes through multiple readings to ensure the required level of relationship between themes, sub-themes and their categories (Bamberg 2012). The analytic approach presented the texts relevant to the research themes as evidence in the findings.

5.8 Trustworthiness of the Study

The trustworthiness of interpretative research is crucial for its validity and reliability (Creswell 2013). The term trustworthiness was introduced by Lincoln and Guba (1985) and has been debated by several other authors to provide a concept that can consider the quality and rigour of qualitative research (Schwartz-Shea and Yanow 2012; Sarah 2013; Saunders et al. 2019). Trustworthiness is achieved once the research process and outcome suggest that they are based on acknowledged practices of good research (Denscombe 2010). The research credibility, transferability and reflexivity were addressed to achieve this study's trustworthiness and address the needs of interpretative research, as shown in Table 5-3.

Table 5-3: Steps Taken for Research Trustworthiness

S.no	Criterion	Steps Taken
1	Research Credibility	The researcher provided a sufficient description of the context through the thick description. All interviews were recorded, and field notes were taken. The researcher worked in tandem with the hermeneutics of restoration (faith) and hermeneutics of demystification (suspicion) for in-depth analysis. The explanatory coherence was achieved through having sufficiency in explanation and analysis by obtaining multiple evidence from data sources.
2	Replacing Transferability with Contextualised and situated validity	The transferability criterion was replaced with contextualised and situated findings. The detailed and holistic contextualised description allows readers to judge the transferability of findings.
3	Researcher Reflexivity	The researcher located HRAPs' sensemaking and sensegiving practices in the practice world through practical and scientific rationality principles. The researcher applied his reflexivity at varied stages of research required in that particular situation.

5.8.1 Credibility

Credibility forms the basis of any claim to be trustworthy, which refers to the magnitude to which a research account accurately represents the social phenomena under study (Silverman 2016). It signifies dependability in expressing the reality that is plausible or seems true, and readers of the research feel confident in using its data and findings (Sarah 2013). Rather than assuming a single reality for investigation, the study established that the findings derived through research are valid and believable through credibility (Saunders et al. 2019). In this regard, the first and foremost step was a sufficient description of the context and its related nuances through thick description (Schwartz-Shea and Yanow 2012; Sarah 2013) so that readers could assess the credibility of the contextualised knowledge generated for its fit to their circumstance (Avenier 2010).

As part of crafting the research situation, besides the ‘what’ aspect of sensemaking and sensegiving practices, a thick description considered ‘whys’ and ‘hows’ while describing the research settings, relevant documents and other sociocultural nuances to preserve the depiction of the context (Yin 2016). The thick description was captured through detailed field notes during the data collection stage and other relevant documents, as they allowed contextualised information regarding thoughts, feelings, and the texture of interactions with research participants to be captured (Sarah 2013).

The fact that all the phase 1 interviews were recorded and field notes were taken for phase 2 contributed to achieving this study's credibility by ensuring that every detail of the HRAPs’ accounts, whether trivial or not, was captured (Creswell 2013). As part of enhancing the credibility of the analytical procedure and the findings, the researcher worked in tandem with both the hermeneutics of restoration (faith) and the hermeneutics of demystification (suspicion) for more in-depth analysis and interpretation aimed at hidden narrative meanings through questioning the taken for granted meanings and paying attention to contradictions and rhetoric (Josselson 2004). It is worth mentioning that approaching analysis from the hermeneutics of faith to suspicion does not mean that participants' narratives are not authentic (Kim 2016). Instead, the approach helped reach out to in-depth realities and decode what would have been left out as “a told story conceals an untold one” (Josselson 2004: 13).

During data analysis, explanatory coherence was recognised as the hallmark of interpretative research (Saunders et al. 2019). Explanatory coherence was achieved by focusing on sufficiency in explanation and analysis through consistent evidence from different data sources, i.e. how opposing and multiple interpretations were discussed and analysed (Saunders et al. 2019). The lucidity with which the arguments were developed represented their complexity and diversity without being too descriptive on the one hand and over-interpreting on the other hand (Schwartz-Shea and Yanow 2012). At the same time, variations in HRAP interpretations were also inevitable, so making the potential source of these differences in interpretations as transparent as possible to account for knowledge claims was a crucial consideration.

5.8.2 Replacing Transferability with Contextualised and Situated Validity

The second criterion to achieve trustworthiness is transferability, which concerns the extent to which findings and conclusions are transferrable from one case (e.g., setting or group) to another (Sarah 2013; Saunders et al. 2019). However, transferability is often difficult to achieve in qualitative research, as in this study, due to the relatively small sample and participants sharing unique characteristics, which is often impossible to replicate elsewhere (Saunders et al. 2019). The adopted research paradigm of interpretivism critically contests the transferability of findings based on the argument that a social phenomenon is context-dependent rather than transferrable to other settings, where it may lose meaning (Remenyi et al. 1998). Similarly, due to the dynamic and fluid nature of the interpretative understanding of reality, reliability and replicability were not a cause of concern in this study (Saunders et al. 2019).

The research replaced the usefulness, desirability, transfer and generalisation of knowledge claims with contextuality and situated validity rippling through the findings and analysis process (Schwartz-Shea and Yanow 2012). A data collection process replicated at another time and place would not necessarily hold the promise of generating the same data as the researcher, and the research participants are seen as embodied or situated in a given context, which may change over time (Schwartz-Shea and Yanow 2012). The findings offered a contextualised understanding and situated validity (Cunliffe 2011). The thick description discussed above provided a detailed and holistic contextual description, allowing readers to judge the transferability of the findings (Creswell 2013).

5.8.3 Researcher Reflexivity

According to Bryman and Bell (2015) and Saunders et al. (2019), the researcher's values, beliefs and assumptions are essential in enhancing the research's credibility. Many scholars challenge the notion of value neutrality and instead argue that the researcher's values, standpoints and assumptions are to be acknowledged, engaged and analysed for their likely impact on knowledge claims through reflexivity (Van de Ven 2007; Schwartz-Shea and Yanow 2012). Alongside research participants, who are the centre of attention for answering the research questions, the researcher's reflexive account brings significant weight to the research (Saunders et al. 2019). Consequently, as part of making research claims trustworthy, researcher reflexivity was the active consideration of how epistemological assumptions, characteristics and particular circumstances during the research influenced the data collection and analysis (Slembrouck 2015). The researcher's awareness of his values and those of the research participants significantly impacts the knowledge claims' reliability, quality, transparency and trustworthiness (Schwartz-Shea and Yanow 2012).

During the research, the researcher was embedded in the research process, shaping the research participants' experience, and his own experience was also shaped by the research participants (Cunliffe 2011). From an ontological perspective, the research was subjectively situated relative to the researcher and participants' embedded experiences, which influenced the interpretations and research accounts, also called double hermeneutics (Cunliffe 2011). The researcher acknowledged his influence over the research process and the criteria for making subjective choices, which may sometimes be imaginative during interpretation (Mantere and Ketokivi 2013).

This research was approached with reflexive awareness of locating the research within their practice world to grasp and elucidate how HRAPs' sensemaking and sensegiving were achieved in practice (Sandberg and Tsoukas 2011). At the same time, the researcher was also reflexively aware of the need to observe the analytical practice as an object amenable to the reflection of HRAPs whose characteristics and composition were being examined. This reflexive awareness has allowed the researcher to develop a plausible understanding to answer the research questions (Sandberg and Tsoukas 2020) and contribute towards enhancing the trustworthiness of this thesis.

The nature and form of reflexivity varied at different stages of research. For example, at the design stage, reflexivity involves critically considering the researcher's characteristics and their likely impact on the research process, such as identity and its possible evolution. The researcher, an HR professional, is fully aware of the impact he can bring to the research process due to his personal experience and identity. The researcher articulated personal and professional values as a basis for making judgements about how the research process was carried out. During the data collection phase, as a reflexive researcher, the researcher adopted an empathetic stance towards the participants to appreciate the dynamics of their social world and understand that reality from their point of view (Guba and Lincoln 1994). Similarly, acknowledging that the researcher's prior knowledge and embodiment of prior learning may have impacted the data collection rendered it co-generated through interaction with research participants and any other evidence or physical material (Schwartz-Shea and Yanow 2012).

Due to the interpretative nature of the research, during the data analysis phase, the researcher’s judgement or cognitive reasoning was an important consideration (Hatch and Yanow 2003). As a reflexive researcher, the researcher brought a clear distinction between his assumption and analysis, meaning there was no tidying-up of anomalies or gaps, particularly during the data collection and analysis phase. As a result, the researcher allowed the research process to remain messy rather than simplifying or standardising it (Dervin 1999). It was considered essential to appreciate that the researcher, rather than trying to control the data while analysing it, remained open to multiple interpretations and possibilities and avoided hasty closure to data analysis through linear thinking (Lüscher and Lewis 2008; Cunliffe and Scaratti 2017). It is important to acknowledge that the researcher's interpretations of the findings sought to grasp the complexity of analytical practice and, simultaneously, not overestimate individual HRAPs' significance. Taking note of this, the researcher operated to maintain an apt balance in unfolding the HRAPs agency and the way they perform their role with prudence, never contradicting their ability to perform in the way they were describing but at the same time not taking things at face value.

Overall, as part of the research being trustworthy, the explicit and transparent recognition of the likely impact of knowledge, personal characteristics, background, values and assumptions of the researcher and their interplay during the research process were critical elements of the research design and execution (Saunders et al. 2019).

5.9 Ethical Considerations

According to Saunders et al. (2019), social researchers must treat the research participants ethically while protecting their due rights. The Research Ethics Guidelines of the University of Bradford guided the research. Accordingly, ethics approval was obtained as per the procedure in these guidelines. The following sub-sections explain the ethical considerations related to this study.

5.9.1 Informed Consent

The study participants were invited to participate through email (see Appendix A). Participants were given the study background and obtained consent to participate in the extended interviews in two phases. The first phase of the interview lasted 60 to 90 minutes and was conducted either on Zoom, due to COVID-19 restrictions, or face-to-face, where possible, followed by the second phase at their worksite, which lasted 2 to 4 hours. Participants were provided with all the required information through the participants' information sheet (see Appendix B). Participants were allowed voluntary participation as they could opt not to answer any questions they did not wish to answer. They were advised that they could withdraw their participation at any time. In the event of such withdrawal, all information regarding them would eventually be deleted.

The first phase of interviews was recorded and transcribed as approved by the participants, whereas, in the second phase, written notes were taken. In addition, they were notified that the data collected would be used for research purposes only and that data would remain anonymous and confidential. Before the interview, participants were requested to sign the informed consent form (see Appendix C). The researcher also countersigned the informed consent form, confirming that the study's nature and purpose had been explained and that any questions raised had been answered. A copy of the consent form was subsequently shared with all the participants for their records. All participants were adult working professionals, and none were disabled or sick. This ensured that participants gave informed consent and that their comprehension was not compromised before participating.

5.9.2 Confidentiality and Anonymity

Saunders et al. (2019) argued that the researcher must comply with the participants' anonymity and privacy. Therefore, neither the organisations nor the participants' names have been mentioned in the write-up. Where direct quotes have been used in the text, identifying information has been removed to protect participant identity. Each participant was given a pseudonym to help disguise his/her identity. To further ensure the confidentiality of the data at the transcription stage, the researcher performed all transcription and subsequent proofreading, which was explained to participants before the interview. The researcher kept the electronic data files, including documents shared by the participants, in a password-protected file on his computer. Additionally, all the data was regularly backed up on an external hard drive to mitigate the risk of losing the data. Hard copies, including printouts or field notes, were kept in a secure location in the researcher's office at his home.

5.10 Summary and Conclusion

This chapter has illustrated the research methodology put into practice for the study. The interpretive philosophical stance provided a more holistic approach to studying HRAP sensemaking and sensegiving practices from subjective ontology, given the qualitative nature of the study, which aimed to produce contextually situated knowledge through an abductive form of enquiry. The qualitative research design suited the research purpose, extended semi-structured narrative of practice interviews and document analysis as data collection methods. The chosen methods allowed flexibility to deal with the research phenomenon's complexity and a certain amount of structure with the potential to achieve comparable findings. The research context, the sampling approach and the access to research participants in an ethically sensitive manner were also outlined. A detailed account of the data analysis approach using thematic analysis has been discussed, outlining the systematic approach to analysing the empirical data collected to discover the ‘how’ and ‘why’ elements of HRAP sensemaking and sensegiving practices and underlying activities. Towards the end, the chapter discussed the steps undertaken by the researcher to assess and enhance the trustworthiness of this study, and then it concluded with the ethical considerations that have informed the research process.

Chapter 6 Findings and Analysis

6.1 Introduction

This chapter presents the findings and analysis for this research in the form of themes that have helped the researcher to answer the main research question and its two sub-questions:

How are the sensemaking and sensegiving practices required as part of their role put into action by human resources analytics practitioners?

The two sub-questions are:

1. Through which cognitive and discursive activities are these sensemaking and sensegiving practices enacted by human resources analytics practitioners?

2. How are tools, technologies and artefacts engaged to support the cognitive and discursive practices when making and giving sense?

As part of the analysis, the themes are derived both from the sensemaking and sensegiving framework developed and discussed in Chapter Four (i.e., the sensemaking and sensegiving perspective) and from data collected through the extended semi-structured narrative of practices interviews in two phases and document analysis, which allowed the researcher to provide an in-depth and rich account of the sensemaking and sensegiving experience. The findings are analysed through a thick description of the situated sensemaking and sensegiving practices and their underlying activities using a detailed representative vignette of the analytical process.

While drawing on ‘performing reflexive conversations’, the thesis identified HRAPs' sensemaking and sensegiving practices and their underlying activities. More specifically, it identified how cognitive-discursive and material activities HRAPs sensemaking and sensegiving as part of their information processing. The findings show that two sets of meaning-making activities, ‘pursuing coherence’ and ‘setting up and delivering the conversations', are essential to HRAPs sensemaking and sensegiving when accomplishing their roles. The findings highlighted HRAPs' ability to draw on 'sensible enactment through material support' while performing these two cognitive-discursive practices. The findings suggest the role involves managing complexity and paradoxes, so HRAPs sensemaking and sensegiving practices also include 'navigating paradoxes'. The sensemaking and sensegiving practices and their underlying activities are outlined in Figure 6-1.

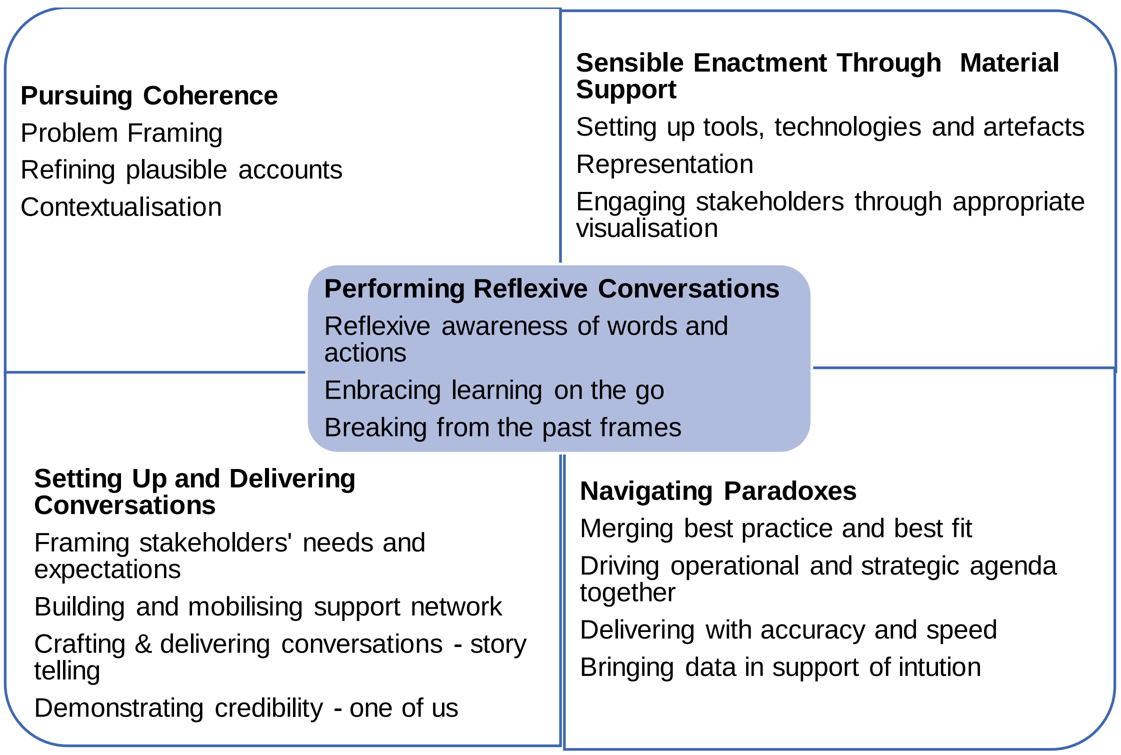


Figure 6-1: Repertoire of Sensemaking and Sensegiving Practices and Underlying Activities of Human Resources Analytics Practitioners

Table 6-1: Data Analysis Structure - Pursuing Coherence

Activities Repertoire First-Order Codes	Second-Order Sub-Themes	Themes
Scoping - Project Charter Framing the hypothesis Stakeholder mapping Framing the questions Refining problem frame Breaking the project scope into smaller chunks	Problem Framing	Pursuing coherence
Refining the sense through multiple iterations Seeking coherence through trends, patterns and relationships Refining the assumptions Running model validation Starting with an educated guess and then refining it From shooting in the dark to aiming it right Performing scenario analysis	Refining plausible accounts	
Mapping the strategic priorities Evaluating historical context Scenario mapping external context Contextualising through metrics Understanding operational context Seeking external data and cues Mapping value-chain process Harnessing contextual diversity	Contextualisation	

6.2 Pursuing Coherence

Pursuing coherence refers to the way that HRAPs in complex and diverse situations, through a range of discursive and cognitive practices, are able to connect observations through data and other contextual cues with one another to reduce equivocality and achieve lucidity and reconciliation in their accounts against the set goals. HRAPs seek to form a coherent account through problem framing, drawing on context and refining plausible explanations as they engage in analytical practices (see Table 6-1). These practices are executed through recurrent, co-occurring and intrinsically interconnected activities to pursue coherent understandings and explanations. Seeking coherence brings out the meaning by connecting discrepant observations and beliefs into a cohesive account.

6.2.1 Problem Framing

In pursuit of coherence, findings suggest that HRAPs engage in sensemaking efforts of problem framing, which entails formulating the analytical problem through the complex process of applying conceptual frames of reference to become sufficiently familiar with the analytical domain. In other words, problem framing is setting up the analytical problem so that it can be addressed through data. The findings suggest that HRAPs are not presented with business problems that need their attention as given (Weick 1995). The organisational issues are to be formulated and represented in a manner that defines their scope, boundaries and context by translating incoherent data and cues into a more coherent and intelligible structure through interconnected cognitive and discursive practices. The representation of the problem through framing it then becomes an act of translating a business problem on an analytics canvas or, in other words, reconstructing it in a different form that makes sense for the targeted stakeholders. HRAPs convert what might sometimes look incomprehensible into a more organised, solvable problem.

During the problem framing, HRAPs deployed a range of socially constructed practices while drawing on their personal experiences and stakeholders' expectations. These practices involved understanding the purpose and objective, what questions need to be addressed, and what the analytical task/exercise output should be. In other words, it was about translating the business goal/problem into a data analytics goal and mapping it to an analytics context through scoping the project, framing the hypothesis, stakeholder mapping, and framing the questions. It also sometimes included refining the initial scoping and breaking the project scope into smaller chunks. As part of sensemaking, this is the process of taking an abstract goal like “how an organisation can forecast the requirement of drivers based on the delivery workload”, as was the case with one of the respondents, and translating it into what data is required, what should be the granularity of analysis, how the data will look, and what modelling approaches might be applicable. It combines understanding the underlying mechanics of analytical questions and matching them to methods to find answers.

Findings reveal that, as part of problem framing, one of the crucial aspects of the analytical project, like any other task, is to define the scope of a project, as it was considered a prerequisite to subsequent sense formation. HRAPs attempt to set the boundaries and extent of their analytics through inclusion and exclusion to help them focus their attention on their task. For instance, respondent 2 works for a sizeable, diversified group of companies in the UAE as Head of HR Analytics. The Group Human Resources Director (HRD) tasked respondent 2 to examine the group's staffing levels in the HR function. The broader question in front of management was, does the organisation have the correct number of people in different HR functions, such as HR Business Partners, Centre of Excellence and Shared Services?

The exercise required respondent 2 to determine the optimum staffing levels for each function within HR supporting the businesses. Respondent 2 explained and showed how different elements of the Project Charter brought clarity, direction and focus. According to respondent 2, he agreed with his line manager, the Group HRD, who was also the project sponsor, on a clear mandate for his analytical task by signing off a Project Charter (see Figure 6-2). The problem-framing practice through the Project Charter was aimed at setting boundaries and requirements for the project. It included all the required elements of the project to be delivered, such as its scope, associated risks, dependencies, timelines, resources and budgets, as reflected in the below quote:

The guiding point was to understand… the question [the] HR Director was trying to seek [the] answer to. Right, so I asked him, “What are you trying to establish?” and accordingly, I got the Project Charter signed off from him. [The] Project Charter helped me scope the analytical exercise and stay on track.

Project Charter

General Project Information

Project Name	Optimum Human Resource Function Staffing Levels	**IMPORTANT REMINDER** A narrative written charter must be circulated and signed by the project sponsors. You can attach a completed version of this template to your narrative written charter in an effort to keep it short and concise.
Project Sponsor	Director Human Resources	
Project Manager	Human Resource Analytics Manager	
[redacted]	[redacted]	
Phone Number	[redacted]	
Organizational Unit	Human Resource Analytics	
Process Impacted	HR Staffing	
Expected Start Date	September 1, 2020	
Expected Completion Date	December 31, 2020	

Problem or Issue, Goals, Objectives and Deliverables

Problem or Issue	Examine the group's manning levels in the HR function to establish optimum number of resources in different HR work streams, such as HR Business Partners, HR Centres of Excellence and Shared Services. The exercise required to establish if the functions within HR were overstaffed in their roles and job families and was also an opportunity to identify understaffed functions.
Purpose of Project	To address concerns with senior leadership regarding the optimum staffing level in HR function across the organisation. This project will attempt to identify the optimum staffing levels and make recommendations.
Goals / Metrics	Determine the headcount drivers for each business in startegic, operational and transactional roles. Assess the current and future business needs. Determine the HR to staff ratio, HR expense to operating expense and HR expense to FTE ratio and benchmark it with the similar companies/industry in the region. Engage the business leaders to provide the required data. Determine the full extent of the problem through data analysis, interviews, and other tests. Develop recomendations for improving and monitor the results of the implemented solutions.
Expected Deliverables	Project Charter, Stakeholder Analysis, Manning Framework, Proposed Solutions, Implementation Plan and Project Summary Close Out

Project Scope and Schedule

Within Scope	This project is limited to only those buisnesses which are fully owned as these buisnesses currenlty rely on the Group HR function for HR strategic and operational support inlcluding government services.
Outside of Scope	Buisnesses which are joint ventures and subsadaries with minority shares will not be reviewed.

Project Resources and Costs

Project Team	[redacted]
Support Resources	Project Management Office staff in Group HR will provide some administrative help.
Special Needs	At least two of the core team members will need network access to the ERP system. The project will also need data support to extract data from two other systems compensation payroll and financial reporting.

Cost Type	Vendor / Labor Names	Rate	Qty	Amount
Labor	[redacted]			
Labor				
Labor				
Labor				
Labor				
Miscellaneous				
		Total Costs (AED)		208,320

Project Benefits and Customers

Process Owner	The Group HR Director owns the overall project. HR Anlytics Manager must make sure to follow a set of procedures for capturing and reporting actual data correctly. The HR Project Management Office provides oversight and support for the project.
Key Stakeholders	All personnel assigned to Project. All personnel who provide leadership support from Leadership Council, including the Group HR Director, leadership team of the business groups.
Final Customer	Group HR Director and the Leadership Council

Project Risks, Constraints and Assumptions

Risks	1. Changes to Project Scope - Project needs to stay focused determining the optimum staffing levels and not expand the project into root causes of excess or shortage in HR staffing within buisnesses and at corporate level. 2. Bad Data - The availability of worforce data and its drivers from the ERP may not be available that even a basic level of staffing ratios cannot be defined. 3. Implementation of Solutions - This project will most likely recommend changes to current staffing levels witihin HR. In some cases, buisness leaders may resist and refuse to adopt these new staffing levels.
Constraints	1. Resources will be constrained to four full time FTE personnel + 1 HR Analyst. There is no further budget to fund any additional resources for this project. 2. Data support from Group IT will be limited for the project and pulling extracts of data from source systems could be slow so a system request must be submitted with advance notice of 02 days.
Assumptions	This project has support from Group Director HR and the Leadership Council. This project assumes that this sponsorship and support is sufficient to push successful implementation of solutions that result from this project.

Prepared by:	[redacted]	Date:	August 20, 2020

Figure 6-2: Project Charter Illustration

The findings revealed that HRAPs defined the analytical problems through a pluralist approach. According to them, it is only by obtaining the perspectives of relevant stakeholders that they can know the exact nature of the business problem/issue that needs to be addressed. At the same time, findings also suggest that, when situating the problem, HRAPs were mindful about whose perspectives they needed to foreground and background. Therefore, problem framing becomes a social process of making and giving sense through closely interacting with the relevant stakeholders. For example, respondent 5 works for a healthcare research company involved with vaccine development in the pharma space. The company was experiencing significant pressure to produce vaccines on a fast-track basis. Amid this tight vaccine trial and production schedule, senior management was looking to shift from a traditional office-based environment to a hybrid work model.

Historically, the company has been operating with the culture of an office-based organisation. As COVID-19 struck, the company shifted most of their workers to working remotely for a period of time and then gradually started recalling some of the employees back to work in the office, and eventually ended up with a hybrid working model where some of the staff were allowed to work from home. When COVID-19 restrictions eased, management wanted to move forward with this hybrid working model, allowing different functions to assess their individual operational needs and decide what proportion of their workforce could work from home or the office. After implementing this work pattern change, management was keen to know employees' reactions to this change, as not everyone might have the same ability to cope. For example, as team collaboration was one of their core values, management wanted to understand the impact of moving to a hybrid model on teamwork and productivity. Respondent 5’s pluralist approach towards problem framing is reflected below:

> *I often went back and forth with the management team on what we were measuring and why, showing them examples of hypotheses I formulated. Management feedback helped me shape the hypotheses. This was important to*

ensure that the project got initiated on the right track and set the expectations right.

Respondent 5 has shown her discursive and cognitive ability to engage with the senior management team to interpret their intent and concerns as part of migrating to a hybrid working model. While framing her understanding of the business problem, she took management concerns and fear regarding employees' reaction/s to the hybrid working model and its impact on company values of teamwork and collaboration alongside employee productivity. To formulate hypotheses capturing the aims and objectives of her analytical project, respondent 5 pragmatically constructed a rallying discourse by listening to the management concerns and inviting their feedback on the draft hypothesis to help her make her hypothesis more accurately reflect the business problem. This pluralist approach helped her to understand and map management expectations and ultimately secure their buy-in.

Contextualising this discussion further and drawing on other analysts' views, this act of problem framing and representation is not only for the HRA function but also requires the input of other departments and functions besides management. Problem framing then becomes a practice of mapping these departments that need to be involved in helping define the business problems or recreate them in a form that makes sense for these other departments, as reflected below in respondent 6's quote.

I had to work closely with the finance and operations team to see if we could bring back this percentage of the workforce in the various functional areas. What would be our spending, and how will it impact the cash flow?

Respondent 6 is the head of workforce analytics for the teaching hospital, employing over 10,000 people in the UAE. During COVID-19, hospitals stopped performing elective procedures and research-related activities as part of government directives. This immediate operational shift impacted the workforce as most of the staff were required to be either laid off or sent on furlough, keeping in mind the needs of the business. When hospital operations resumed, these staff were recalled based on the operational requirements. As head of workforce analytics, respondent 6 was expected to provide analytical support to the business to help make informed decisions. At the front end of making these informed decisions, He had to perform analytics to support this workforce planning at a fast pace. The critical decision to be made by management was what percentage of the workforce needed to be returned to work at what time, keeping in view financial ability from the cash flow perspective and operational needs of the business. To answer this question, respondent 6 carried out workforce cost modelling to help him make sense of the financial impact of multiple scenarios when executing workforce plans prepared with a short-term focus.

In respondent 6's context, as part of his role to offer analytics reports and findings, he recognised that the problem-framing activity should also involve mapping stakeholders outside the HR function. Thus, respondent 6 put into action his discursive abilities to bring business operation teams, finance and HR together around one table to have a consolidated perspective by organising a series of meetings. In these meetings, as part of his sensemaking experience, he took the opportunity to understand the revenue drivers of the business, their impact and how workforce planning can drive these revenue drivers. In addition to collecting the relevant information from these meetings, respondent 6 spotted that the business was keen to understand which areas of the hospital could or could not come back to work immediately and the impact. While doing so, he used appropriate language and metrics, e.g., cash flows and productivity ratios, to connect his analytical objectives and the required data. In his practice of problem framing, he mapped the needed support of the Finance and Operations departments and ensured the flow of the required data input deemed necessary for his workforce planning.

The sensemaking and sensegiving practices of framing the relevant questions as part of problem framing helped HRAPs explicate their current frames. The discursive practice of asking the right questions to the stakeholders helped respondent 8 to define more precisely how she needed to support the stakeholders in their operational decision-making, as evident in the quote below:

You know, I spent a fair bit of time understanding the current context by asking questions to the stakeholders and then whiteboarding them with the team and the human resources business partners.

Respondent 8 is leading the HRA portfolio and was mandated to define the right strategic priorities and constantly review the impact and added value of the analytics function's activities. In this regard, she decided to put in place an HRA strategy, and, accordingly, she sought the required investment into people, data and technologies. To help define the strategic priorities, she reached out to two sets of stakeholders, i.e., business managers and human resources business partners (HRBPs), who supported business managers in bringing data into their discussion while working towards supporting businesses in their business strategy execution.

The sociocultural awareness guided respondent 8 to frame her questions appropriately for the targeted audience. For example, when addressing business partners, she was keen to understand the local context from the HRBPs' perspective. She explained that some HRBPs avoided using numbers when approaching their business managers. Thus, she asked HRBPs about the reports they regularly use and their challenges in getting insights from those reports and advising business managers. The objective was to gauge how HRBPs consumed and shared data and determine how to improve their capabilities. In addition to the HRBPs, respondent 8 also approached business managers with questions such as what business questions they needed to answer. What kinds of decisions are businesses required to make regularly? What is the data businesses regularly need for their operations? Why is a piece of data essential for business operations? Furthermore, what are the current gaps and concerns in the data that need improvement?

For HRAPs, this sensemaking practice of linear questioning sometimes leads them to oversimplify an issue. Findings demonstrated that HRAPs refined the initial frame/s by revising their fundamental assumptions about a problem and its contexts. Refining the initial frame/s helped HRAPs avoid missing key elements, perspectives and connections for their analytical project. It also made them aware that their inherent logic based on past frames was insufficient. This cognisance motivated deeper exploration, which resulted in alternative problem framing or redefining the initial scope of the situation, as happened in the case of respondent 11:

So, we thought it would be a straightforward exercise, right? You know, to look at all the psychographic and demographic data that we have for the relationship managers, and then, you know, run a basic analysis to, you know, predict good relationship outcomes. As we moved into the project and examined various data streams, we quickly spotted that data offered us more than that, so we had to refine our scope accordingly.

Respondent 11 works for a large financial services institution employing relationship managers looking after small to medium-sized enterprises. The analytical task respondent 11 got to work with was to identify the attributes of the successful relationship manager that would inform recruitment decisions in the future. As he moved into the project and examined various data streams, he spotted that data offered more than he initially thought. His initial scoping was predominantly the outcome of his past frames of predicting the profile of successful relationship managers. He thought that to predict the profile of successful relationship managers, he would have to analyse behavioural traits, competencies, and demographic data and their pattern and relationship to net promoter score and sales. His initial sense was that it would be overly complicated, and his initial plan was to perform a simple regression analysis to get the desired outcome.

As respondent 11 moved into the project, data offered him a different way of approaching this project, and he decided to move away from his initial frames and be open to advancing the project from a different perspective. As the analysis continued with further data points, he moved away from his initial thought of approaching the project by identifying the most effective relationship manager to being more of an optimisation problem using the right combination of relationship profiles. The project scope moved from identifying one successful profile to identifying a grouping of successful profiles.

For HRAPs, the magnitude of the business problem sometimes poses enormous challenges due to its sheer size and complexity. To simplify the complexity stemming from the business problem, analysts broke down the project into smaller, more manageable mini-projects, as evident in the case of respondent 12, reflected in the below statement:

We had to break it out into workable chunks for the crew, which turned out to be a huge and challenging optimisation problem.

Respondent 12 was working for an airline in the UAE where crew scheduling has always been challenging, with no forecasts or anything to help the operations team understand what might change between, e.g., today and tomorrow, so the operations team had to rely on their experience and intuition instead of forecasting through data. There are two types of crew scheduling: flight operations, which refers to pilot scheduling, and flight, which refers to flight attendants. Every morning, crew scheduling must make assignments for the next day, so they do this on a rolling basis.

Respondent 12 embarked on a project to help the business operation on this crew-scheduling assignment. The main issue in front of respondent 12 was providing a solution to help forecast flights and optimise them, keeping in mind different types of crew segments alongside considering the financial impact of scheduling options available for each crew segment. The crew scheduling problem was challenging and had an enormous scope and impact on the operations. To frame this more extensive and complex task, respondent 12 broke it down into smaller projects, developed a proof of concept for each smaller project, and tried measuring their benefits and impact on the business. He started with a scheduling model for contractual-type assignments and then evolved that model into more complex scheduling.

6.2.2 Refining Plausible Accounts

The findings support the previous work exploring when and why sensemaking processes conclude by offering empirical evidence of how plausible accounts are constituted (Weick et al. 2005; Schildt et al. 2020). Various practices adopted by analysts suggest the iterative nature of the sensemaking process in which HRAPs try to refine their plausible accounts through a range of cognitive and discursive practices. The findings point towards how these cognitive and discursive practices are put into action in support of each other to seek coherence. Even when HRAPs did not find their explanations and understanding entirely satisfactory, they settled on accounts that offered them sufficient plausibility and continued their efforts to achieve the desired coherence if time permits.

The findings revealed the interplay of various cognitive and discursive practices for enhancing plausibility to seek coherence. HRAPs gravitated towards specific understanding out of possible multiple interpretations based on their perceived plausibility derived from the subjective coherence they perceived among salient cues, frames and actions (Weick, 1995). As analytics is a goal-directed activity, HRAPs consciously attempted to link observations, beliefs and actions into coherent understandings of the situation. The findings suggest that plausibility relates to HRAPs' ability to match existing explanations with salient observations and cues. While doing so, findings suggest that analysts either confirm their initial understandings in the light of their goals or challenge and enrich their understanding in pursuit of plausibility.

The findings suggest that HRAPs underwent several iterations to refine their plausible understanding as part of sensemaking. Plausible accounts helped HRAPs take action and create further opportunities for refining the sense, and over time, they equipped themselves with supporting evidence to improve their efforts and refine their sensemaking. Interpreting the trends, patterns and relationships across seemingly both related or unrelated data, information, and events constituted cognitive sensemaking practice, which ran across all the HRAP accounts. After collecting the required data, various statistical analysis methods were used to seek coherence by identifying trends, patterns or relationships within the data to help generate creative, valuable solutions to problems, as evident in the below quote from respondent 11:

To begin with, I had seven behavioural patterns in the data. And then, we reduced them to three as I went through several iterations with the data. Eventually, we settled on the three behavioural patterns by examining different trends and patterns in the data.

For respondent 11, refining the behavioural patterns emerging from the data was an iterative process to refine his plausible explanations stemming from the data to carve the combinations of successful relationship managers' profiles as an outcome of his analysis. The practice of multiple iterations helped respondent 11 reduce the initial discovery of seven behavioural patterns to three for meaningful analysis. To identify the successful profile of relationship managers, respondent 11 identified different patterns profiled extensively to build their identity, i.e., to understand what they represented regarding their behaviours and sales performance.

The first pattern was inexperienced, entry-level relationship managers who typically have a maximum of two years of work experience in their first job. For these entry-level relationship managers, respondent 11 identified differentiated behaviour around connecting with senior leaders in the business to actively seeking coaching and mentoring opportunities. The second group or cluster or segment of relationship managers has five to 10 years of experience in the financial services industry. For the experienced managers, respondent 11 picked up from performance data and the behavioural pattern that they tended to be more successful due to their storytelling abilities. And then the third cluster was the relationship managers not coming from financial services. They worked in another job and then moved to the relationship manager role. For this group, respondent 11 identified some behaviours around nurturing relationships with customers and storytelling, but they could also develop a completely different set of relationships with the customers. Thus, relationship managers usually establish relationships with the Chief Financial Officers (CFOs) or the financial teams in their business, whereas these managers could develop relationships much more broadly across the C suite in their client organisations.

Respondent 11 refined his plausibility through his emerging frame that some helpful information was waiting to be unearthed from the data. The plausibility was achieved through pattern identification based on data classification through abstract frames and the statistical information extracted from patterns and/or their representation. For HRAPs, the act of plausibility becomes the way to develop abstract frames into precise models that describe patterns of observation, transforming the best-fitting models into real-world explanations to seek coherence.

To refine the plausible explanation, the findings suggest HRAPs worked on their own and stakeholders' assumptions to seek coherence in those assumptions surrounding business problems. The HRAPs' sense of plausibility differed depending on the doubts and their ability to question their assumptions. Their plausibility in provisional forms of sensemaking derived from a critical analysis of multiple assumptions and their understandings, often through a creative synthesis of pre-existing assumptions or developing new assumptions that meet situated goals and helped justify their relevance in the light of tasks objectives as per the comments from respondent 24:

Like in any other predictive model, I also had certain assumptions in mind for this model. These assumptions are based on workload, corresponding drivers' *demand, utilisation in various locations, and seasonality. In my conversations with business heads, I challenged and refined some of these business assumptions based on my gathered business input.*

Respondent 24 was keen to seek coherence in his plausible explanations by refining his assumptions, which formed the basis of the functioning of the driver forecasting model. He identified assumptions that must be factored in while refining his model functioning. The first assumption was that drivers could do as much as they had done in the past. There were a few other assumptions related to the profitability of each order based on the mix of international and domestic orders. Respondent 24 was committed to challenging and helping the stakeholders eliminate flawed assumptions. While challenging the stakeholders' assumptions and helping them refine their understanding of the business problem through data, he also scrutinised and validated his assumptions.

As mentioned earlier, sensemaking was an iterative process for HRAPs wherein they were involved in various cognitive and discursive practices to validate their understandings. The validation process output helped refine the initial sense and paved the way for subsequent sensemaking, as shown and explained by respondent 14.

I ran multiple validations of the forecasting models based on the initial assumptions, and then, when the assumptions were refined, we had a subsequent round of model validation with the project managers.

Respondent 14 underwent various iterations of refining her assumption, which drove the forecasting model for staffing construction projects to work, so she underwent a series of validation steps. As her assumptions were refined, she ran the validation of these assumptions and checked the model's efficacy. These meetings with the project managers were structured through critical metrics discourses based on each project milestone, the projected workload during ramp-up and ramp-down, staffing levels and the financial viability of each project. After performing model validation, respondent 14 also discussed and validated her results with the HR and commercial departments. The output of these validation exercises helped her further refine the initial sense, which became the springboard for subsequent sensemaking.

Findings also revealed that, as part of plausibility, there had been situations where HRAPs have had to start forming their understanding of the situation and the context through what HRAPs referred to as educated guess or experience, but, in essence, it meant their past interpretative frames. While using past interpretative frames in certain situations may not offer a clear picture or sense of the situation, HRAPs drew on various practices or tools to refine their initial guesswork as their sensemaking went on. The findings suggest that frames influence the observations and beliefs HRAPs attend to, constraining or expanding the set of possible understandings. These frames served as the lens from which HRAPs construct or evaluate their plausible and coherent understandings. The findings suggest HRAPs' interpretative frames guided their plausibility while making sense, as depicted in the below quote by respondent 2:

Although I started with a hazy picture, I refined my understanding of the data by contacting domain expert advice through benchmarking as I moved on. At the same time, it is important to acknowledge that every organisation is cut differently when it comes to benchmarking. So, the classification from benchmark data does not give you an obvious idea of your organisation, and you are shooting in the dark. Your experience and knowledge play an essential role here.

Respondent 2 acknowledged that he started with a blurry and vague picture, which was refined and cleared as he moved further in his analytical journey. He faced a situation where he did not have complete expertise in all HR functions. Also, the data available to him within the organisation had certain limitations. To work in unfamiliar or less familiar territories, respondent 2 drew on benchmark data to better understand the situation at hand. Through benchmarking, he obtained insights to help him compare the HR staffing levels with those of similar organisations. When comparing his organisation with other organisations through benchmark data, respondent 2 highlighted considerable challenges.

Benchmarking presented a novel situation to respondent 2 as he felt inundated with benchmark data to spot as it was difficult to classify and categorise the data for meaningful comparison, i.e., an unfamiliar basis of classification and comparison. For example, he struggled to find data comparable to his organisation. There was some region-specific data for the companies based in the Middle East. For respondent 2 to make inferences from the benchmark data, he had to make certain assumptions about how to benchmark. Respondent 2 observed that directly comparing some of the benchmarking standards was irrelevant to his context. So, he needed to classify and correctly categorise the data to ensure it fit his organisation's size, scale, geography, and circumstances based on his past interpretative frames. For example, every organisation counts full-time employees based on its business model, which needs to be considered to draw a better comparison.

When seeking plausibility, data and context presented various scenarios for making sense to HRAPs. In order to evaluate the impact of a strategic or tactical move as part of the analytics, HRAPs refined their plausibility by examining relationships of various variables within the system through data-intensive simulation under some given hypotheses called scenarios. Findings suggest that HRAPs drew on scenario analysis to help them understand the impact of options/variables impacting the problem or issue. Scenario analysis provided HRAPs with a process to estimate shifts in the various options/situations – scenarios – following the "what if" analysis principles. The outcome of scenario analysis informs HRAPs' subsequent sensemaking, as depicted in the below quote from respondent 28:

My analysis focuses on performing structured scenario analysis to help me make sense of varying contexts and their implications for both business and HR. The *different options under consideration by all operational departments drive these scenarios.*

To refine the plausible explanations regarding the financial impact of the changing business context, respondent 28 decided to run a structured scenario analysis with all the business functions wherein all different scenarios and their contextual input and assumptions were listed down, and their potential financial impact was analysed. For example, the sales team was forecasting a certain percentage of reduction in sales orders, then, with the support of the finance team, those inputs were put into economic models to arrive at an option of cutting down a certain overall percentage of the production cost. Then, various scenarios were examined from that production cost and schedule to optimise the workforce cost, considering the workforce availability amid COVID-19 that met the overall objective of optimising the production.

6.2.3 Contextualisation

The findings suggest that, when pursuing coherence, establishing connections to the organisation's pivotal issues and root causes and working towards desired outcomes through critical thinking are essential to HRAPs' sensemaking and sensegiving practices. These practices require analysts to analyse business strategy and issues and understand how the human side of the business connects to these issues to have a pivotal impact on business results (Rasmussen and Ulrich 2015; Ulrich and Dulebohn 2015). The findings suggest that HRAPs engaged in cognitive and discursive practices to achieve a sense of the business context shaping the analytics domain. These cognitive-discursive practices involve creating the connective tissue between the strategic and operational aspects of the business and appreciating the manifestation of multifaceted business realities.

Findings suggest that HRAPs consistently shared their experience of understanding organisation-wide priorities in-depth. However, they took different situated and contextualised approaches to organise themselves to draw on the business context.

HRAPs provided an account of early-stage strategic discussions, which helped them look at things differently from more traditional ways of thinking from an inward focus on HR data utilisation. HRAPs expressed their aim to enhance the use of HR data and analytics when executing strategic business initiatives in their respective organisations. Findings revealed that HRAPs deploy various cognitive-discursive means to make and give a sense of the strategic context in which they operate. These practices created feedback loops that enabled continuous learning and ensured that analysts stayed relevant to the context, as highlighted in the quotation below from respondent 8:

As I mentioned, I mapped the strategic priorities to ensure we put our efforts into the right priorities.

As part of her newly formulated HRA strategy, respondent 8 was keen to improve the organisation's capabilities around data governance, data quality management and data privacy management to ensure that the organisation has the correct data that is also better quality and can be accessed faster. This data management is not only in HR but also connects HR data to broader business data catalogues accessible across the organisation. Furthermore, to achieve this, she was required to have a strategic picture in mind to visualise how the end user would operate with the data. Respondent 8 applied her cognitive sensemaking practices of mapping the business priorities to ensure she worked in the right areas to deliver value. While mapping, she strategised to have two approaches to deliver value owing to the diversified nature of the three different business lines operating within varied contexts. On the one hand, she had to offer analytics support at scale, so she devised a strategic project of HR metrics and a dashboard to serve the group. On the other hand, she could establish that some businesses sought specialised and differentiated analytics projects to solve pressing issues such as high employee turnover.

HRAPs explained that grounding analytics into business reality involved establishing a connection to the business intricacies by appreciating the multiple domains and manifestation of business realities within a historical context. In this regard, they sought to draw on the historical knowledge of the relevant stakeholders from the business management to seek historical context shaping their analytical context. The findings suggest that HRAPs valued the past cultural context to appreciate the past's sociocultural intricacies. In this way, HRAPs were able to obtain a sense of the past and present cultural context shaping the analytics domain to help them factor in the cultural context in their analytical efforts, as reflected in the below quote from respondent 17:

In my case, there were historical contexts which I needed to understand to appreciate the business context better. There have been a few past workforce planning and talent mapping attempts that did not succeed.

While establishing a connection between HRA and the business context, respondent 17 had to create a meaningful account of past workforce planning initiatives. Various data and cues had to be evaluated and analysed to get a sense of past initiatives. In the past, the organisation's workforce planning was more headcount planning to meet the annual budgetary requirements rather than strategic workforce planning involving overall capability assessment and planning. Respondent 17 recognised that, historically, the organisation had talent vulnerabilities in the competencies required to work in fragile and volatile countries like Somalia and Afghanistan to drive the humanitarian support agenda. After making sense of each regional office's past strategic plans, he challenged senior leadership's existing thinking and practice of workforce planning. His historical account of workforce planning helped him construct a business case for approaching workforce planning from an organisation capability perspective led by data-led talent management initiatives to support the regional offices in achieving their strategic agenda.

In addition to relying on internal business settings and sociocultural aspects, HRAPs shared their experience of putting the external business environment into context. They had to quickly spot the requirement of mapping the external business context based on the need of the analytical task and drew on activities such as scenario mapping to map the external business context for their respective businesses, as reflected in the below quote from respondent 28:

To understand what we are trying to do as a business in the short, medium and long term, I need to look outside the organisation through scenario mapping. If an external market is changing in a particular way, how will it impact our business?

For respondent 28, putting the internal business strategies into context also meant evaluating the external business environment's impact. Contextualising the external context meant making sense of the potential impact of COVID-19 on business strategy and the operational plan on a short, medium and long-term basis. The sensemaking of the external context relied on scenario mapping. Multiple what-if scenarios were mapped for the potential impact of lockdowns on the continuity of the business. For example, the supply chain was impacted significantly due to lockdowns in various countries. The potential impact on the workforce was the other concern for respondent 28. Potentially, what could happen if any of the employees were infected? How would business continuity be ensured? What critical roles were required in the office to keep the show going? The factories needed minimum staff to run the facilities to meet the production targets set out in annual plans. Mapping various potential scenarios and their impact through the above scenario-based questions enabled respondent 28 to understand the overall business context and its impact on the workforce.

HRAPs mentioned their practice of contextualising business metrics related to their analytical projects. In addition to conversations, they had to rely on relevant metrics to understand the business context and explore the relationship and pattern between various variables in the analytical tasks, as highlighted below quote from respondent 2:

For me, it was vital to understand the business context and headcount ratio of HR to the workforce for each function in HR and the business. These ratios were backed by the data and metrics on each function's current workload.

According to respondent 2, as part of HR's staffing rationalisation exercise, it was necessary to understand the headcount drivers for each business within the group. Before approaching business heads, he compiled the data on the current workforce count in each business alongside the existing workload. He prepared various workforce utilisation ratios and how they sat with the profitability and revenue of each company. Before conversing with the business heads with specific questions about the projected workloads, he shared this data. This data helped him steer his discussion on the right track and facilitated making all his stakeholders understand the importance of this HR team's rationalisation exercise. The conversations supported by the appropriate metrics helped respondent 2 to understand business intricacies and ensure the required input from the business for his subsequent analysis. These contextual inputs also provided all concerned with a fresh perspective on business issues instead of relying on what is on offer from the current context, especially in dealing with future projections.

While drawing on the context, besides connecting their analytical work to strategic context, HRAPs did acknowledge the relevance of understanding the operational context, i.e. day to day how the business activities are being carried out and the data implications regarding these operational activities. Findings suggest that HRAPs deploy practices such as mapping the operational touch points to seek their understanding of value creation in the business, as mentioned by respondent 24.

I started with understanding all the primary and secondary activities that go into service creation and the role played by the drivers.

Respondent 24 was tasked to develop a driver forecast model for an e-commerce business entity to project and plan the requirement per warehouse or city in each country to cater to existing and projected workload. He started his work on the driver forecasting model by understanding the business context so that the model could capture all the business scenarios and issues. For him, understanding how business value is driven and the driver's role in this value chain was important before he could contextualise data. He mapped all the touch points across the entire order life cycle, from picking up the order to scheduling the order with the customer, shelving it in the warehouse, dispatching it, delivering it to the customer, and, if undelivered, returning it to the client. Data from these touch points formed an essential element in the model as these were mapped to reflect the business process. In addition to these data points, the other necessary data is the number of dispatches, which, according to respondent 24, was a function of the client forecast. In addition, he also decided to look at the historical trend encompassing this data.

The findings also indicated that, besides extracting data and cues from sources internal to the organisation, analysts reached out to external cues and data. The requirement of the analytical task dictated this decision to rely on external data and cues, as highlighted in the following quote from respondent 28:

In addition to the internal data, I relied on external data, particularly regarding evolving health and safety situations alongside government rebates. So, you are scanning, understanding, and trying to make sense of it.

According to respondent 28, seeking and validating external data was very important. This meant scanning the business context internally and externally to understand strategic complexities as they evolved. As mentioned by respondent 28, it was vital for him to keep reminding himself that these contextual inputs were significant before he could analyse and interpret data to seek solutions grounded in business reality. Without grounding the findings in the context, the findings and recommendations may lose their value and relevance in front of senior management. As respondent 28 mentioned, the biggest challenge was not jumping straight into analysing the data, as the other contextual cues in various government initiatives were equally critical. First, he was keen to understand the possible scenarios he was dealing with, which way the market was heading, and which path his industry was heading while managing the COVID-19 pandemic.

The findings suggest that, while drawing on the context, HRAPs were also aware of the contextual diversity and managing it by harnessing it instead of getting distracted or carried away. HRAPs pointed out the challenges related to context diversity, which impacted their analytics efforts, as reflected in the below quote from respondent 5:

> *I thought the only way to make the context work for us [was] to harness it by learning from it and appreciating how employees are experiencing this context in their own ways.*

Respondent 5 described understanding context as harnessing it and learning from it was regarded as an integral aspect of her sensemaking and sensegiving efforts. According to respondent 5, while analysing the impact of burnout as part of studying the hybrid working model, different measures and concepts were primarily context-driven activities. In addition, as part of learning from the context, respondent 5 quickly realised that exploring and exploiting what exists within the data set in a given context was essential as there was so much richness in that. For example, some demographic groups were more burned out than others; they experienced more destructive team relationships due to conflicts within the teams due to moving to a hybrid working model. There were personalised elements of an employee being impacted by different demographic and company characteristics that could have affected how they responded to the survey questionnaire.

6.3 Setting Up and Delivering Conversations

Communication is perhaps one of the most important activities defining the HRAP role. HRAPs usually do not make any decisions regarding managing business operations; instead, they focus on delivering insights to the management to support the decision-making. Subsequently, ineffective communication practices while providing insights will primarily inhibit the effectiveness of the meaningful patterns discovered and interpreted as data insights. Consequently, the way HRAPs make sense of the data and the context and then convey that sense to influence others cannot be understood only through their analytical abilities.

HRAPs' ability to operate effectively and utilise their analytical expertise is more likely to be effective when they can draw on their discursive skills to position themselves to interact with others in their organisation. Hence, findings provide insights into how analysts set and deliver conversations to create sense and influence others through situated dialogue, which requires examining their intent and the underlying context. The discursive means and patterns that govern a set of practices are broad and go beyond using the correct language, terminologies, plot and modes of delivery conversation delivery.

In addition to crafting and delivering conversations, the findings reveal that ‘setting’ refers to the practices of HRAPs to bring people together around the analytical project to make and give a sense of it. Specifically, these practices are related to framing stakeholders’ expectations, building and mobilising the support network, and demonstrating credibility (see Table 6-2). These practices also included identifying the early adaptors of analytics, bringing them on board, and utilising them to influence others while considering particular situations and contexts. These ‘setting up’ practices paved the way for delivering the conversations as they happen and ensuring a positive outcome. All these four sets of discursive practices and their underlying activities are interrelated and situated practices invoked in a sociocultural context.

Table 6-2: Data Analysis Structure - Setting Up and Delivering Conversations

Activities Repertoire First-Order Codes	Second-Order Sub-Themes	Themes
Awareness of diverse data needs Mapping preconceived notions about the efficacy of data Sociocultural awareness Segmentation based on data literacy level Driving cultural change among senior management	Framing stakeholders' needs and expectations	Setting up and delivering conversations
Drawing on support from line managers Establishing rapport with influential stakeholders Empowering data champions Drawing in support through collaboration Spotting the early adopters Seeking validation of contextual cues	Building and mobilising support network	
Using appropriate terminologies to relate to the audience Crafting a compelling story out of data Using the right operational metrics to relate to business Simple messaging – avoiding technical jargon Not losing sight of key messages Telling a story in a language the audience relates to	Crafting & delivering conversations – storytelling	
Richer appreciation of the business context Walking the common ground Demonstrating value added to the business Taking stakeholders through the decision-making process Bouncing off findings before the final presentation	Demonstrating credibility – one of us	

6.3.1 Framing Stakeholders' Needs and Expectations

Among other practices of setting up, the findings suggest that the approach HRAPs used to make and give sense encompasses the discursive practices to frame stakeholders' expectations. Framing stakeholders' needs and expectations included continuously understanding, managing and monitoring them. More specifically, expectation framing is the process of engaging and forming expectations to generate interest, secure buying and increase the likelihood of effectiveness of the analytical project. HRAPs positioned themselves to be mindful of the variance in power, status and situations of others, considering the knowledge HRAPs have of others, for example, their interests, management style, business challenges and personal stories.

HRAPs provided accounts of their conversations and were observed in discussions with their stakeholders to manage stakeholders' expectations by connecting the issues they faced to their interests and priorities. These sensemaking and sensegiving practices aim to create meaningful opportunities through appropriate language using appropriate words and terminologies and stay connected to the context. In some ways, framing needs and expectations refers to a constructive conversation that attempts to reconcile divergent needs, demands and interests from various stakeholders and then prioritise them.

Recognising the diversity among stakeholders in their preconceived notions about the potential use of data supporting their decision-making forms the critical aspect of HRAPs' approach towards framing stakeholders' expectations. HRAPs adopted various discursive means to understand preconceived notions regarding data use concerning the business challenges their stakeholders were facing and then adopted a persuasion strategy to manage these preconceived notions, as evident in the quote below from respondent 24.

Every person you are dealing with is different. So, how you would convince a particular stakeholder is not the same as with others, particularly their approach to managing their business through data.

Respondent 24 pointed out that every business manager he was dealing with faced some unique challenge to manage with varying preconceived notions regarding data efficacy to support their decision-making. Thus, these business managers had their way of dealing with the situation based on managerial intuition. Realising this, respondent 24 prepared three scenarios in his model and shared them with managers specific to their business challenges. Some business managers were comfortable implementing aggressive profitability plans based on their business's historical performance and intuition, so respondent 24 showed them how the driver forecasting model could help them drive efficiency and aggressively generate targeted profitability. In contrast, some managers were not aggressive in their plans and wanted to go slowly. Thus, respondent 24 demonstrated how they could play safe through this model.

In the case of multiple stakeholders, awareness of their personalities, stories, leadership styles and interests was considered necessary while giving sense to these stakeholders. Findings suggest this sociocultural awareness helped HRAPs to relate to these stakeholders effectively and ensure the flow of relevant, well-structured communication on time. This communication took various forms, from informal conversations/feedback to formal reports and presentations and was regarded as an ongoing activity that needs to be maintained throughout the project's entire lifecycle with due care and responsibility. In addition, adjusting oneself to the stakeholders' characters and preferences also helped engage stakeholders and secure their buy-in. For example, respondent 6 said:

I know the personalities well enough that I know kind of their management style by now. So that helps a lot, you know. So, I would ensure I only gave them the data about the relevant areas at the right time.

Respondent 6 had a good understanding of his stakeholders' personalities, and, as a result, he could anticipate what they were looking for and why. He could relate their business requirements to their personalities and anticipate the information the stakeholders required in their decision-making. The data content, format and volume were adjusted according to each stakeholder’s requirements on a fast-track basis. After sending his reports, respondent 6 took feedback on the reports to identify what worked and did not work well regarding the stakeholders’ requirements, formally and through conversations in follow-up meetings.

In addition to understanding the expectations, leadership and management styles as part of sociocultural awareness, findings suggest that HRAPs’ awareness of the data literacy level of their stakeholders was critical to enable them to adjust their communication, as highlighted by respondent 11 in the quote below:

Also, figuring out stakeholders' interests and data literacy levels during the course helped attune our communication of the findings accordingly.

During his project, respondent 11 worked with multiple stakeholders, and his awareness of stakeholders in terms of their data literacy levels was an essential aspect of his sociocultural awareness. Respondent 11 distinguished his stakeholders based on their data literacy level during interactions and put them into groups. The first group was not keen to be involved heavily but expected to be informed when the findings were ready. According to respondent 11, the second group was probably slightly more sceptical and believed they already knew what makes a good relationship manager based on their extensive experience in the business. This second group was unsure about the outcome of the analytics, so respondent 11 had to do a fair bit of work with them to help them understand how he got the results and persuade them to believe in the efficacy of the findings. The third group of stakeholders had the necessary data literacy and a keen interest in the project, with good involvement in the project journey. Respondent 11 crafted messages appropriate to the different stakeholders based on the stakeholders' segmentation.

Interestingly, the majority of HRAPs were faced with situations where the leadership lacked a data-based decision-making mindset with regard to HR. The narrative accounts suggest that HRAPs engaged in discursive practices of addressing the perceptions of senior leadership and encouraged them to adopt data-based decision-making. In such situations, HRAPs focused on persuasion, believing that doing so may help drive the cultural change from the top regarding HR analytics' utility in facilitating decision-making. While appreciating that this cultural shift would be a slow process, it was about adopting different convincing strategies for getting leadership to see the intended benefits of using data in HR with some success stories to drive their enthusiasm and commitment to analytics projects.

So, you have to instil a change within the organisation, the perception and behaviours of the senior management, and the culture for data-driven HR decision-making. This is not a plug-and-play scenario, as a lot goes into it, and it takes years to get it right.

Respondent 17 understood that senior management historically relied heavily on their intuition and judgement to manage their talent. Thus, for him, driving senior management to base their talent decision-making on data was about changing the perception. He started to improve the leadership's perception and change their mindset so that they appreciated how talent data could help improve their decision-making. Thus, through his actions and the right choice of words in his conversations, respondent 17 started slowly sharing the talent reports and then improvising them as senior management had varying perceptions of the talent data as they were at different stages of readiness.

Understanding the organisational data requirement and aligning communication tools to it was critical for analysts to manage their expectations to help determine the most effective communication method to fit the purpose. Tailoring content on the HR dashboards to audience needs increases the likelihood of making the analytics function relevant, as respondent 8 demonstrated and explained in below quote:

As you can see, it will help if you tailor your dashboards as per the audience, whether it is new entry-level employees who are navigating the organisation for the first time, or it is an employee who wants to understand the structure of the team or an experienced manager trying to know what headcount is available and how that relates to his future workload requirements.

Respondent 8 was able to pick up the need for understanding, navigating and mapping different types of data and reports for the management team and everyone in the organisation. Through walkthroughs, she identified the diverse needs of businesses concerning their data needs and tailored the dashboards accordingly. As part of data sensitivity, she was also aware that all types of data might not be suitable to share with the whole organisation and that confidential and private data must be kept personal and private.

6.3.2 Building and Mobilising Support Network

As part of their sensemaking and sensegiving, the findings suggest that HRAPs draw on their ability to mobilise support through various discursive means and practices. In the event of the absence of a desired support network or where there were perceived challenges, they were keen to build support. Accordingly, relating to the right stakeholders formally and informally to draw on their support has helped HRAPs create a sense for self and others. In this regard, the conversational practices revolved around how they position themselves to receive feedback and encouragement, capability building, management of collaborative meetings, and awareness of identities, interests, and points of resistance, as they all help to deliver relevant conversations. HRAPs implicitly draw on their deep knowledge of organisational norms, sociocultural rules and power dynamics. They put into practice their discursive ability to exploit this knowledge to build and mobilise the support network.

Findings suggest that this support network could come across various organisational levels, starting from the reporting manager, as depicted in the below quote from respondent 17.

It ensures that the CPO [Chief People Officer] is supportive of what will be presented, and staying close to the CPO during this process is the data we are collecting.

It was important for respondent 17 to keep the CPO on his side to draw on the necessary support during or after the talent review meetings. According to respondent 17, before the meeting, he would go to the CPO, show him the complete deck of talent reviews and invite his input. This process helped respondent 17 build the necessary support and obtain critical feedback on his findings. Similarly, after meeting with the CPO, respondent 17 shared his results with key stakeholders to gauge their reactions before the board meeting. For respondent 17, it was about running through sample data or, sometimes, the first draft to say this is what he had so far. This way, respondent 17 could take the heat out of any controversial matters before the meeting. In this approach, according to respondent 17, by the time he went to the meeting, the key decision-makers had already seen what they were going to be shown, and there were fewer chances of the presentation being shot down, and it was much more likely that it would go smoothly. Respondent 17 used his connection to influence the board through his reporting manager on areas such as the business case for a change in the talent profiling for country managers to include additional behavioural competencies alongside the existing ones.

HRAPs also shared their practice of identifying and relating to influential business stakeholders. In this way, they could establish a rapport with these significant leaders holding important positions who could exercise their authority to help win the support of others. HRAPs spotted and connected to these individuals by establishing common threads and interests and sought the support and feedback required to execute their projects. Thus, the ability to pick this kind of supporter from the stakeholders with good data sense and influence over others is one of the critical ingredients to project success, as indicated below quote from respondent 11:

Establishing rapport and connection with a person of decisive influence was critical for me. The role that he played made sure that we stayed relevant in terms of the kinds of questions we wanted to answer. He had a solid, visceral sense of the data and the outcomes and bought into it. He then managed to exercise his influence to our advantage.

According to respondent 11, he established a rapport with an influential stakeholder with relatively good data sense early in the project. He drew on his support by collaborating with this important stakeholder who kept him honest in his analytical efforts and helped him secure buy-in and win influence over other stakeholders due to his strong presence in the organisation. The discursive ability to relate to influential leaders through suitable discursive means to take input on different business outcomes and scenarios holds the key to the sensemaking of the data. The discursive means involved in these situations are appropriate business language to acquire the required information and data to be fed into analytics. A better working relationship with this kind of stakeholder has been immensely helpful in driving the messages across as and when needed.

When HRAPs faced challenges in implementing their data analytics agenda, the findings suggest they decided to spot data champions and empower them through various means and practices, such as quarterly town halls and road roadshows. These data champions were from the wider HR team. These data champions then acted as change champions in driving the analytical agenda forward, as mentioned below by respondent 8:

> *From a change management perspective, I put up a training plan to empower HR business partners to use data creatively and be data champions in their respective businesses. I also initiated a quarterly HR showcase to showcase what they have done* with data.

Respondent 8 identified HRBPs as data champions to help create change and encourage businesses to put data at the forefront of their decision-making process. She decided to empower them so that these champions could mobilise the support from the business. She quickly spotted that HRBPs were not data savvy; although they were used to running Excel spreadsheets, creating pivot tables and sending those to their operations leaders, they did not understand the business implications of the data they used. Her initial focus remained to help HRBPs build essential data literacy skills, think creatively and develop curiosity. After this basic introduction, she provided training on statistical concepts, so they had to be familiar with medians versus averages, how data gets skewed and what can be done with it. In addition, she initiated a quarterly HR showcase where HRBPs attended and presented what they had done with the data and how they had used it and invited feedback from the business on how HR could help and support the business outcomes through data.

The findings suggest that HRAPs, when faced with the challenge of providing a solution to complex organisational challenges as part of their sensemaking and sensegiving repertoire, tend to collaborate and bring appropriate people with the right expertise and information together within and outside the organisation in constructive ways to address the challenge at hand. More specifically, collaborating with the team that is being directly impacted by the business problem and drawing on its support facilitated recommended solution/s adoption, as mentioned below quote from respondent 12:

The other significant thing is collaborating with the flight scheduling and operations teams. With the flight scheduling team, it was, like, listen, you told me you have trouble managing uncertainties of what will change between today and tomorrow. Here is how it can help you to make informed choices on manning.

According to respondent 12, the level of collaboration required for the HRA project was one of the key ingredients in the project execution. Respondent 12 engaged in collaborative practices of reaching out to the flight scheduling team to look at scheduling challenges from an end user or business perspective instead of just talking and understanding the extent of the business problem and its intricacies through the data. Through continuous collaboration, respondent 12 drew on the continuous support required to execute the project successfully and demonstrated how his solution blends and adds value to the decision-making required for flight schedules. These collaborative practices helped respondent 12 prove his case to establish the efficacy of the flight scheduling model and the associated monitoring dashboards. The scheduling team collaboration allowed him to demonstrate through tangible benefits how the proposed scheduling model will equip the scheduling team to access their data and data from other parts of the organisation as needed for better forecasting. At the same time, he made the scheduling team aware that the model would not be able to resolve all their problems in one go, but at least it was a step in the right direction by removing some of the uncertainty and giving the team a baseline for where things can fluctuate when it comes to forecasting.

6.3.3 Crafting and Delivering Conversations - Storytelling

Findings indicate that HRAPs engage in ongoing conversations throughout the analytical project. These conversations aim to continuously exchange creative and constructive ideas and feedback to develop the correct conclusions and results that aid decision-making. Such ongoing exchanges through conversations helped HRAPs narrow the gaps when they interpreted the data and applied the outcomes to realise the potential of the insights. The second purpose of these communications was to deliver analytical insights to the management to support decision-making. The way HRAPs crafted and provided these conversations to influence others cannot be understood through their analytical abilities only. The findings draw attention to the discursive practices, including bringing together different crafting elements and delivering conversations ranging from using appropriate language, text and numbers to avoiding technical jargon and analytical stories as they perform their roles. These crafting and delivering conversation practices are social activities HRAPs produced to achieve set goals in particular situations. This act included thinking carefully about the people and the conditions in which HRAPs find themselves, which can lead them to produce more meaningful conversations appropriate for the situation and responsive to others' needs, values and expectations. The findings showed that HRAPs also knew that conversation performances do not have to be verbal and face-to-face; instead, they can be performed in different settings and ways to reach the right people to achieve the desired objectives. In addition to having face-to-face meetings, analysts also used MS Teams meetings, conferences, phone conversations and many other mechanisms.

When conversing, the HRAPs focused on using the right words and terminologies to help them relate to their stakeholders for the required support. While doing so, they also drew on their knowledge of the business situations and challenges learned through earlier conversations, as evident in the below quote from respondent 6:

I conversed with the Finance and Operations teams to understand the critical business drivers and their financial impact to determine the cash flow viability for various workforce planning options.

Respondent 6 was doing workforce cost modelling to help him make sense of the financial impact of multiple scenarios when executing workforce plans prepared with a short-term focus. Respondent 6 drew on the CFO and Operations Head to seek and validate input on various variables impacting business models, business cash flows and integration with the different workforce scenarios. Respondent 6 demonstrated his discursive practices to engage with the stakeholders to mobilise internal networks from the Finance and Operations teams on a demanding and fast-paced data analytics task. He had to rely heavily on his conversations with these stakeholders as financial numbers and operational scenarios were changing rapidly, and he needed to keep pace with these changes in his cost-modelling exercise. To get the proper financial and operational context for analytical activity and ground his findings on the business's financial condition, respondent 6 chose financial indicators such as cash flow to help understand the financial situation, impacting his recommendations. In addition to respondent 6's discursive ability to connect to the right stakeholders using appropriate language and terminologies to acquire the required information and data to be fed into his analytics, he also used these stakeholders to validate his findings before publishing them to the broader stakeholders.

As part of conveying sense, storytelling through data appeared to be a common practice for HRAPs. Regardless of the context, varying analysis methods, the difference in stakeholders and the nature of the analytical tasks or activities, the tradition of crafting the analytical story through data remained the key focus for the HRAPs. To deliver findings of any analytical exercise, HRAPs engaged in the practice of crafting a story from their findings, which potentially can engage the audience and provide insights, as mentioned in the below quote from respondent 11:

I was keen to stay relevant and develop a compelling story about my findings by clearly demonstrating the linkage between various combinations of relationship managers and net promoter scores.

When crafting the story through the data, respondent 11 came up with his analytical story ending before he figured out the middle and the beginning. The end part of his story showed the impact on the business performance of all three categories of relationship managers individually and then in combinations. When demonstrating the implications of findings and the right combination of relationship managers, respondent 11 positively impacted business performance through an increase in net promoter score. In this way, he kept his storyline relevant to the business context and established practical relevance and impact of his findings to help stakeholders decide. In doing so, the story concluded with actions for concerned stakeholders to take and the predicted consequences of those actions. Before completing this storyline, respondent 11 consulted with stakeholders to discuss various action scenarios as he never wanted to hear, “You need to do this, and you need to do that” while delivering his presentation.

While delivering conversations, HRAPs pointed out that they used plots and storylines that are relatable to the audience and that they can understand and identify with their situation and the context. For example, these storylines and plots often drew on business outcomes such as the impact on revenue, savings or return on investment and increased employee engagement, resulting in increased productivity and operational efficiency in a quantifiable term. Such an approach in their data storytelling has helped HRAPs to demonstrate tangible value addition through HRA initiatives, as mentioned by respondent 2.

I tried to make my story very clear, concise and relatable to my audience, as my objective was to make them understand the impact of decisions regarding HR staffing levels as they would impact HR operational efficiency and cost savings.

For respondent 2, delivering a compelling analytical story meant having a concise and relatable plot from the analysed data. To make the analytical story relatable, respondent 2 stepped into the shoes of the senior managers who were going to consume the findings he was trying to share. Respondent 2 developed a storyline and plot to facilitate business managers to make informed decisions regarding staffing levels and the possible savings impact of HR costs while improving operational efficiency. He compared the current and future state of HR function cost and its operational efficiency.

Findings suggest using appropriate language and terminologies by HRAPs as a connecting link when conversing. Through using relevant operational metrics and crafting a message around those, HRAPs were able to relate to the common agenda of the business and analytics project as and when required to support their analytical endeavours, as reflected below in respondent 28’s quote:

I was keen to tell a story through the data in a language the audience could relate to. My understanding of workforce drivers from a business perspective was vital to using operational/functional language through the right metrics with the business.

When delivering conversations, respondent 28 regularly referred to things such as bottom line, workforce cost, gross margins and productivity ratios to relate to the business context and the stakeholders’ issues. According to him, staying consistent with the organisational strategic plan of cost rationalisation enabled him to surpass the divergent business team opinions and bring the team to the shared interests of the business (human resources planning with its cost impact) and his agenda for cost rationalisation because of COVID-19 lockdowns. Respondent 28 also consciously staged conversations with management to draw management's attention to burnout and other engagement challenges when reducing staffing levels. He was aware that some members of the management team, particularly the finance head, were keen to bring the staffing cost down to the extent that it might adversely impact the productivity in the factories, and it would be a tough sell to convince the finance head not to reduce the staffing below that threshold level to avoid workforce burnout.

Findings also indicated business managers were uncomfortable with technical terms such as statistical methods, specifying actual regression coefficients and p-value or significance level. HRAPs were conscious of these gaps in understanding around some technical details that varied from organisation to organisation and within stakeholders. Therefore, the conversations and data stories were crafted while avoiding technical language and jargon. HRAPs used business terms that were very close to the business managers. For example, according to respondent 15, there is no use of very nice-looking analytical graphs if they cannot deliver a storyline that makes sense to the consumer of these analytics. While communicating through reports and slides, analysts highlighted their approach of staying simple, relevant and free of jargon, as highlighted by respondent 15 in her below quote:

“My conversations are based on simple and easy-to-comprehend terms with no technical jargon of analytics for my audience as they are non-technical people when it comes to analytics”.

For respondent 15, keeping it simple and relevant meant staying focused on taking the client's perspective in terms of interpretation. She used terms easily consumed by the audience and avoided jargon. Thus, instead of using terms like p-value or significance level, she used expressions like a confidence interval, which the managers were familiar with. Similarly, she ensured the labelling of various data clusters and that other terms were used with due explanation wherever needed. For example, instead of saying effective commitment, she found it helpful to say “wanting to stay” because it was less jargon than effective commitment.

HRAPs admitted they were often tempted to describe technical details of the analytical activities they followed as part of crafting and delivering conversations as the main component of their findings. They pointed out that they had learned through their experience that, most often, the audiences for analytical results do not care what process has been followed; they only care about results and implications. Therefore, they shared, providing some procedural and technical details as appendices wherever applicable. HRAPs were conscious that technical information sometimes gets in the way of telling a good story with data, as pointed out by respondent 21:

> *I started with what my audience needed to know. Instead of many texts, I have simplified numbers and percentages to just the essential data elements. The reports were made as simple as possible, with some footnotes describing technical details as needed to help with interpretation.*

Respondent 21 made his reports and analysis simple to make it easier for the stakeholders to interpret and act on those findings. In addition to using simple terminologies, he inserted footnotes explaining how data had been collected and analysed, along with definitions where required. Respondent 21's prime focus was to foster an essential perspective on the employees and organisational scene, the connections between the various elements of pay and benefits, and the issues they care about most when examining the impact of the new salary and benefits policy. He grouped the stakeholders according to their participation levels, type of interest and the impact they could make. This helped him a lot while communicating throughout the project to the stakeholder groups. Further, respondent 21 ensured that he was not putting jargon and rich text into his findings; instead, he was keen to strike a nice balance between text, numbers, and percentages, which can help the reader stay focused and engaged when reading his reports or presentations. Respondent 21 mentioned that he did make sure to include the technical details of the process followed for his analysis in an appendix to the report and presentation.

6.3.4 Demonstrating Credibility – One of Us

As part of making and giving sense, the findings suggest that HRAPs can relate to others and make stakeholders 'feel' and 'sense' that they are with them. For HRAPs, demonstrating credibility is an integrative phenomenon where they consciously coordinate activities and efforts or choose words and phrases that make them relate to others and feel "one of us". Through conversational practices and actions, it was about making stakeholders appreciate that HRAPs understand where they came from. The HRAPs' objective was to engage and influence the decision-makers so that they were not only there to deliver information and insights but also as a partner in decision-making. As part of conversations, HRAPs shared that they felt responsible for continuously gauging their outcome of analytics in the form of insights so that the content and analysis cohered with the listeners regarding motives, concerns, objectives, purposes and goals.

The findings also suggest that pitching conversations and analytics findings and recommendations to stakeholders and expecting them to own these findings and recommendations means a richer appreciation of their business challenges – making them see HRAPs as one of them, having mutual interests and mutual benefits. For example, as part of discursive sensemaking and sensegiving practices, HRAPs were engaged in multiple iterations while working on the HRA projects. Their sensemaking and sensegiving may call for the repeated engagement of stakeholders to establish their credibility while appreciating the business dependencies and challenges in executing decisions, as indicated in the below quote from respondent 28:

It was an iterative process where we had those lengthy meetings to explore the different scenarios based on the challenges faced by the business heads.

Before presenting his findings, respondent 28 went through an iterative process with the stakeholders to help him relate to the business realities. Knowledge gained through these meetings helped respondent 28 craft his story and invite feedback on the business assumptions, particularly in the supply chain domain. Understanding and assessing the context and business problem from the stakeholders' perspective required multiple conversations for sharing and evaluating knowledge, creating new agreements regarding the business assumptions, and making changes where needed. As respondent 28 was engaged in multiple iterations, he established his credibility to identify better what differences and dependencies were of consequence to the business decision-making, mainly due to the cross-discipline collaboration required to implement the findings.

Through various practices and gestures, HRAPs felt obligated to make the listeners and audience members see and walk on the ‘common ground’ they shared. To get the analytics findings right and implemented and add the required value to the business means a team playing together to win is an attraction and appeal that speaks volumes of their credibility as analysts. Additionally, findings also suggest that these multiple iterations also ensure that HRAPs were staying honest and relevant to the context and integral parts of the team, as mentioned below by respondent 6:

It was staying relevant as a team player by demonstrating that you understand the issues, i.e., how the recommendations will likely impact the patient care operation.

As part of his sensemaking and sensegiving experience, respondent 6 considered returning to his understanding of patient care operations and how the proposed decisions might impact patient care operations. He wanted to be perceived as a team member instead of an external consultant. While doing so, the appreciation of the business situation and intricacies helped him stay relevant and walk the common ground when presenting his reports and findings. For example, respondent 6 mentioned that few areas returned to work faster than others because they could make arrangements to operate safely and carry out their operations safely. These decisions and events must be factored into the subsequent analysis.

One of the common findings was that the organisations constantly scrutinised the credibility of analytical outcomes in terms of the value they added to the business. Thus, accordingly, HRAPs were keen to demonstrate the value added to the company as a result of their analytics findings and recommendations, as indicated below comment from respondent 12:

Sometimes, you might have the most extraordinary innovation on the data from the tech front, but if it is barely being used, there is no real point. So it is around ensuring that everything you invest in delivers a return on your target investment.

The above quote reflects respondent 12's approach towards making sense of his role while looking at HR data and technology very much like a product where there is a market, which in his case is his organisation, and he wanted to make sure that the solutions or the products that he is developing on both data and technology fronts are adopted and adding value to the business. To make a business case and demonstrate potential added value to the company for the flight-scheduling modelling project, he prepared a return on investment study in financial terms.

The findings suggest that HRAPs tried establishing credibility by taking stakeholders through their decision-making process instead of sending them the action points. For example, HRAPs positioned themselves as being in the shoes of stakeholders and taking them through the decision-making process, as highlighted by respondent 11:

So, this is how you influence the stakeholders' decision-making process: by taking them through it rather than only giving them data-driven insights. We were able to, I think, get them to a point where they go, Okay, that makes sense.

Respondent 11’s financial services organisation annually appoints approximately 100 relationship managers. Therefore, in terms of hiring relationship managers, it was one of the essential things to make the right hiring decisions. Understanding this decision-making process when hiring relationship managers and offering advice on how the successful relationship profile looks for the organisation formed a critical element of the analytical exercise. To align the support for his sensegiving efforts through establishing credibility, respondent 11 took all the stakeholders through the process of selecting the right combination of relationship manager profiles instead of only offering insights into his findings. This way, he could draw critical stakeholders' support to convince others. This approach was necessary when there was more than one successful profile, and, to be successful, the organisation had to mix three profiles to get the right combination. The importance of being clear, transparent, and taking stakeholders through the decision-making process is linked to the fact that, historically, the analytical function operated in silos and messages used to be ambiguous.

Establishing credibility also involved understanding the various perspectives on the findings and recommended actions. HRAPs operate in a boundary-spanning function where there is an increased possibility of the requirement for multidisciplinary inputs and expertise, which are sometimes unavailable within the analytical team. HRAPs reported an increased level of acceptance of the findings when there is mutual respect for listening to and learning from each other, as indicated in the below quote from respondent 2:

Before I went with a big bang with my findings, I first bounced them off with sensible persons in a safe environment.

The above comment shows that respondent 2 knew that, as part of his sensemaking and sensegiving, he had to build a network and coalition internally within the business to bounce off the findings and invite input. Respondent 2 looked for the right people who know the subject and can be trusted to support and advise on this sensitive issue within HR and the business community before finalising his findings. In this way, respondent 2 overcame his lack of knowledge in some HR domains and enhanced the findings' credibility.

6.4 Sensible Enactment through Material Support

During the second phase of the interviews, HRAPs showed and told insightful and rich accounts of their material practices through their hands-on approach. The study participants repeatedly showed and told about the materialisation of cognitive and discursive practices through sensible manipulation of their physical environment, amplifying their sensemaking and sensegiving capacities. From a cognitive perspective, when enacted sensibly, these TTAs extend HRAPs' capability to process mental content to support cognitive functioning. They serve as external data repositories and facilitate functions such as extracting and optimising the data and cues and representation involving storage, processing and retrieval of data and categorising experience. Similarly, discursive practices are also supported through engaging in appropriate visualisation and producing sensemaking and sensegiving accounts that link past, present and future which can be seen as acceptable, coherent and plausible. HRAPs referred to these TTAs as their visual support, suggesting their materiality was essential to generate plausible interpretations for self (sensemaking) and others (sensegiving). HRAPs had shown and described how ideas that emerged through relatively free and non-purposeful manipulation of the materiality of these TTAs (dashboards, metrics, whiteboards, slides, simulation, statistical tools, Excel spreadsheets, etc.) helped generate/capture cues and then gave rise to plausible meaning to be refined later. The data analysis structure of the theme of sensible enactment through TTAs is shown in Table 6-3.

Table 6-3: Data Analysis Structure - Sensible Enactment through Material Support

Activities Repertoire First-Order Codes	Second-Order Sub-Themes	Themes
Formulating the action plan Familiarity with driving the usage of the tool besides its functionality Managing challenges and constraints Integrating different tools and systems for enhanced output Combining various data sets through a unique identifier Awareness of action possibilities and tool limitations	Setting up tools, artefacts and technologies	Sensible enactment through material support

Linking material cues with statistical logic Validating provisional interpretation Translating from provisional interpretation to holistic interpretation Verifying the correctness of fragmented data Collating data through templates Categorising and organising Optimisation through workflow and Instruction	Representation	
Forms following functional intent Simulation/synthetic visualisation Translating verbal ideas into concrete cues Real-time visualisation through dashboards Seeking alignment Monitoring the efficacy Visualising the narrative	Engaging stakeholders through appropriate visualisation	

6.4.1 Setting Up Tools, Technologies and Artefacts

HRAPs demonstrated how they achieved their goals by setting up TTAs in their respective contexts. In doing so, practices' social and material dimensions were entangled through perceived affordances aimed at realising their analytical aims. These TTAs had physical forms, e.g., whiteboards and computer hardware, although some did not, e.g., statistical tools and Excel spreadsheets. The findings suggest that HRAPs had to set up various tools and resources ranging from Excel spreadsheets, organisation databases and enterprise resource planning (ERP) systems in an organised manner to support their cognitive and discursive practices. Based on HRAPs' accounts and conversations, these TTAs were set up alone or combined in many ways based on how they were perceived in terms of their role in analytic practice in the light of set objectives and goals. Setting up entails the practices HRAPs engage in materialising the individual or combined action possibilities afforded by the material artefacts in the light of analytical purposes.

Taking the affordance perspective when setting up TTAs allowed the HRAPs to reflexively put single or combined material features into practice. The practices of combining various tools and resources were subject to the process of perceiving affordance, primarily driven by the features of the TTAs and a sense of familiarity with the TTAs. HRAPs reported situations where artefacts have multiple affordances on their own, and when combined, they give rise to a nexus of action possibilities that HRAPs have to exploit. Indeed, with these numerous affordances, it was the awareness of action possibilities combined with the simultaneous ability to find and extract relevant affordances from the tools and resources based on the set objectives. The researcher observed that HRAPs, based on the nature of the task, could perceive better affordance through ongoing interactions with TTAs (single or in combination). The subsequent sensemaking and sensegiving relied on HRAPs' strategies to integrate and combine various TTAs and put them into practice. The findings suggest that the perceived affordance of artefacts allowed HRAPs to work in multiple ways to suit their stated objectives.

The findings also highlighted that social and material features might exist apart, but their value comes from how they are enacted together in analytical practice with a clear action plan. The findings suggest that the perceived affordance of various tools for making and giving sense depends upon the readiness and intent of the actor when acting with them, as the possibilities of the action are not always provided and granted. To set the tools up, analysts formulated and executed a clear plan of action to collate data to reach out to the relevant cues through tools and resources based on the scope of their analytical task, as mentioned below by respondent 5.

I had to sit back and figure out what to collect. In addition to data available in the organisation through employee engagement surveys and the previous round of individual interviews and focus groups, I decided to collect data through a survey and as per defined constructs and variables.

The objectives of the analytical task dictated the data collection plan, and accordingly, respondent 5 took stock of the available data that could be analysed to help answer the business questions. As part of the plan, respondent 5 collated all the available data within the organisation through an organisational data depository. She examined the recent employee engagement survey and broke it down by departments, business units and different demographics. Respondent 5 also mentioned looking at sources like Glassdoor comments for employees who had left the organisation without exit interviews. She also conducted an extensive literature review to develop relevant constructs and variables. Based on the gaps identified in the available data, the plan was to collect further data through a survey, as there were areas where respondent 5 did not have data to extract findings. The potential benefits and outcomes of the materialisation of the survey tool depended on how she prepared herself to realise the affordance.

The process of perceiving affordance was also subject to filtration, driven mainly by HRAPs' sense of familiarity with the context of their operation and the data depository in the organisation. Respondent 11 figured out the affordance of the available systems and the modules in the organisation quite quickly regarding all data available. As there were independent systems to be accessed to generate data, their value for extracting the required data comes from how they were used to collate the needed data. HRAPs' perceived affordance was also subjected to social settings and the capabilities to access the system. He scanned the organisation's ERP for the required data. Indeed, respondent 11's rationale was to leverage existing affordances that resided in available information tools/sources, and familiar material interfaces with existing ERP modules by organising for the subsequent action. He picked up the right data points from the available data from financial and sales modules within the organisation to extract trends, patterns and relationships from the data for carving profiles of successful relationship managers, as depicted in the quote below:

So, we had a range of psychometric and cognitive assessments combined with performance data. We also had the financials per customer relationship and net promoter scores. For me, it was critical to reach out to varying modules in our ERP system to pick the right data points.

When putting the tools into practice, the perceived action possibilities in the form of affordance also bring challenges. While enacting these TTAs, the sensemaking of analysts entails managing these challenges despite the perceived positive affordance of these tools. When respondent 5 decided to collect further quantitative data through surveys as a tool perceived to be an appropriate tool/method to collect data, she had to manage a series of challenges around data collection, as depicted below:

I had to manage some practical constraints, mainly around sample size and how to get a response from different groups in the organisation.

Data was the prime source of cues available to respondent 5, so reaching out for data within and outside the organisation remained a key focus. Respondent 5 had to manage a series of challenges as there were multiple sources from where cues were supposed to be collected. It was very challenging to get an adequate sample size of people from various departments in vaccine manufacturing because they were heavily occupied with their work. Some of the data was available in the enterprise data warehouses, and, at the same time, some data was outside the data warehouse, available in various departments and functions within the organisation. These sources were fragmented and were not integrated. Respondent 5 carried out different steps to bring data into shape to serve as cues for meaningful analysis, such as pulling the data into Excel sheets to secure it. In addition, as the context was changing rapidly, demographic data was required to be updated frequently to preserve data integrity.

However, familiarity with and visibility of information alone does not yield the desired output in all situations and contexts. The findings suggest that different systems in the organisations may exist independently, each having specific affordances; their value in certain conditions and requirements comes from how they are enacted together. There were multiple situations where HRAPs were required to gather data from various systems that needed to be integrated and aligned. For example, for respondent 28, besides having the right tools, it was crucial to have them adequately aligned and integrated to get maximum value out of them to serve the purpose of the analytical task as highlighted below:

Integrating different data systems was an essential aspect of this analytical task, where data from multiple functions was considered to maintain consistency and alignment across the organisation.

Respondent 28 explained and showed how he prepared the integrated Excel sheets for the members of the finance and business teams. After pooling the data from various sources, he formatted the Excel sheets as per the required format and managed them so that there was no disconnect between them and the accuracy and rationality of the data were not compromised. The stakeholders maintained and accessed a common data thread in this manner. In addition, respondent 28 could drive efficiency, effectiveness and the governance needed for the data. Thus, in their renewed form and format, Excel sheets enabled respondent 28 to deal with pooling data from multiple systems, making it assessable to the team and giving them complete control of it.

To categorise the data collated from multiple sources for subsequent analysis and interpretation in a cohesive manner, HRAPs deployed a range of material practices to support their cognitive efforts. While data storing and retrieval activities were tool-driven practices, the cognitive actions of HRAPs also deployed mental frameworks to support these tools. These frameworks further facilitated the human brain's cognitive function when combined with the processing capacities of the tools and systems. In doing so, the findings reveal specific features of HRAPs' interaction with the TTAs. HRAPs prepared themselves to coordinate with their internal mental state and TTAs. These preparatory actions were necessary, keeping in mind the limitations and functions of the TTA when HRAPs try to establish a link between elements in the TTAs and to what those elements refer to achieve the stated objectives. These actions become part of processing through external representation, as depicted below in the quote by respondent 6:

It was not necessarily data warehouse driven as much; I would probably be pulling some things from a data warehouse. However, I also had to build many shadow spreadsheets. Pulling them together, mashing them together, side by side, combining them through a unique identifier.

Respondent 6 was handling data from fragmented sources, which was required to be analysed to produce many ad hoc reports. To bring data from these fragmented sources to one platform for analytical purposes, respondent 6 showed and explained how he used Excel sheets effectively for merging and combining data and then slicing it out for different stakeholders' needs. To effectively utilise data from these systems for sensemaking, respondent 6 used a unique identifier, employee number, as a framework in the data as a connection between different spreadsheets containing data extracted from multiple sources. Using a unique identifier as a cognitive practice enhanced the spreadsheets' functionality and allowed respondent 6 to capture and combine data sensibly.

Based on the nature of the task, findings suggested that HRAPs had to use TTAs in combination to achieve the desired outcome level. The awareness of action possibilities from various TTAs and their limitations was crucial in helping HRAPs decide on the tools to support their analytical work. While doing so, HRAPs' understanding of the affordance of various tools available to them played a significant role, as mentioned in the below quote by respondent 12:

Instead of Excel, I am using Alteryx to generate forecasts from the model created for a specified number of future periods and then load them into our Tableau server so that this can be accessible to a broader audience.

Regarding tools, the question guiding respondent 12's choice was how he could provide the forecasts. As there was a particular outcome expected from the analytical process, it was essential for respondent 12 to understand the limitations of the different tool options available to him to evaluate his tool options. During conversations in phase two, respondent 12 highlighted some row limitations in a spreadsheet or the inability to trace his steps easily, causing cyclical error nightmares or untrusted data to proliferate in the organisation. In addition to familiarity with the TTAs and the analytics task's purpose, understanding the available TTAs' limitations drove HRAPs' action to get the desired results. Respondent 12 decided to use Alteryx combined with Tableau to ensure he could process the forecast by pulling data from multiple sources for analysis and providing output to the end user through Tableau. During follow-up conversations, respondent 12 pointed out that another essential feature of the tool that helped him a lot was to use queries that the business unit analysts had already written, which helped him diagnose the problem and continue using those queries that he considered helpful.

6.4.2 Representation

The second phase of the extended interviews brought the materiality of various TTAs deployed by HRAPs during information processing to the forefront through emerging representation. The materiality of representation is manifested through the retrospective and prospective assessment of the coherence and plausibility of the multiple interpretations through TTAs. These TTAs helped the performance of complex cognitive activities by providing specific representation in particular ways by shaping HRAPs' thinking and reasoning processes and canalising them in clear directions. For instance, when retrieved by analysts, various software served as data repositories, supporting task-specific mental content and facilitating the construction of interpretations.

Furthermore, the interactive features of the tools facilitated HRAPs' ability to classify their experiences and ideas into emerging frames, subsequently supporting meaning-making and meaning-giving. The findings suggest that common activities in representation were to decompose or deconstruct various variables to identify their components, trace and identify cause-effect relationships, and determine and verify the nature of the supporting evidence. The representation also provided the materiality of seeking plausibility for the explanations on offer and supported optimising workflows and instructions.

HRAPs, during the second phase of the extended interviews, spoke about their specific actions through intermediatory statistical tools and techniques to interact with the representation. These actions help HRAPs to coordinate between their internal cognitive frames and external representation structures and anchor their mental processes on external representation. HRAPs established a connection between their cognitive processing and the representation to perform analytical reasoning to draw inferences and even alter internal cognitive processing through these tools and techniques. Through these actions, HRAPs could adjust, add to, create or remove mental frames based on the representation in support of detecting the relationships. HRAPs made these choices of action based on their perceived expected outcomes of the analysis, as explained by respondent 2:

After identifying the head count drivers in the businesses, I used Ordinary Least Squares regression to analyse the data to identify the relationship between the relative HR activity and the number of employees in each role in Excel using the XLSTAT add-on statistical software.

Before HRAPs could bring artefacts into use for their analysis, they prepared the data and also decided on the most appropriate statistical tool or method based on their cognitive frames. According to respondent 2, the objective was to understand the different staffing levels across the business in relation to business activity. To perform the analysis, respondent 2 first identified activities driving the headcount. Where more than one activity drove the headcount, he combined these activities into an aggregate measurement of business activity using weighted averages and then ranked the resulting cumulative business activities for the period under study for 23 business units.

To understand the relationship between the business activities and the number of HR staff performing those activities, respondent 2 used Ordinary Least Squares

(OLS) regression to estimate linear regression equation coefficients to describe the relationship between relative business activity and the number of HR employees in each role. Respondent 2's decision to use an appropriate statistical technique using a suitable tool was driven by his goal to bring objectivity to his process of detecting relationships. Respondent 2 brought rigour to his interpretation and analysis using the statistical method of OLS regression in Excel to establish the link between business activity and staffing levels.

As HRAPs worked through the analytics process, various tools represented an increasingly plausible interpretation, appearing more sensible. Whereas the tools used in extracting data and cues provide how data was made available for further work, the tools at representation represented more plausible meanings to the data (without conveying a false sense of finality). For example, the shift in plausibility was made possible by testing model consistency across various scenarios and stabilising the model. Respondent 24, for instance, mentioned:

I am talking about how we validated the model on the ground. So we created a simple metric, a simple chart that tracked, you know, the volume that is being handled versus the forecasted volume on which the drivers were allocated.

To help refine the plausible explanations, respondent 24 compared the predicted number of drivers from the model versus the actual number of deployed drivers. Respondent 24 tested his provisional interpretations regarding driver forecasting based on retrospective analyses through metrics. By observing the actual numbers of driver trends over time, respondent 24 decided to allow the delta at 5% between what was forecasted and the actual utilisation. Accordingly, he decided to monitor for delta. Respondent 24 pointed out that he presented three different scenarios, i.e. conservative, moderate and aggressive, and then invited feedback, which helped him test his plausible explanations.

Furthermore, as part of validating the model, respondent 24 also showed how he ran multiple simulations of the model while changing a few parameters with each run and recording the results. These simulations were based on “what if” scenarios to help improve the model’s assumptions by testing how they affected the model’s output and analysing the sensitivity of these assumptions to the model and vice versa. The materialisation of metrics and the model supported the evaluation of emerging interpretations. Respondent 24 searched for a sense of order among multiple ill-defined understandings and the provisional relationship between different assumptions in the model that would reassure him of the plausibility of emerging coherent interpretations. He could produce a redefined relationship between the number of drivers used and the model’s projections and adjust the delta, suggesting that materiality was essential to validating provisional interpretations.

In the transition to a final interpretation and analysis, the sense expressed and represented by TTAs becomes increasingly plausible and holistic. As the practice through TTAs evolved, loose ends were tied in, and the partial understanding was tested, stabilised and reified into a more holistic sense in a given situation. For example, when arriving at characteristics of the successful profile of relationship managers, the initial findings from the data sets resulted in seven segments with a confusing and incomplete picture. Nevertheless, then, to arrive at a more conclusive sense, respondent 11 moved from a partial to a holistic understanding through clustering analysis with the help of a statistical tool, as depicted below:

We ran a clustering algorithm and got our initial seven clusters down to three, which was helpful.

As depicted in the quote, respondent 11 demonstrated how he conducted a cluster analysis to make sense of associations and patterns in the data. Respondent 11 started his investigation without assumptions about the likely relationships within the data regarding behaviours. With the help of tools, clustering was done to reduce clutter in the data by grouping similar data regarding relationship managers' behaviours. Clustering was used to group data points to arrive at a more holistic and refined sense of the data, as it helped to find outliers. After the first cycle, where seven clusters were identified, a second cycle was associated with the emerging understanding to reduce the clusters to produce meaningful patterns. Respondent 11 reflected upon not-so-conclusive and complex provisional interpretations due to excessive clusters as part of his retrospective assessment. He decided to refine the groups for a more holistic and complete picture of his abstract mental frame of reduction through the materiality of the clustering software facilitated by providing and revealing the computation.

Findings highlight that HRAPs faced a situation where the organisations had fragmented data. Some HRAPs reported how, at times, they were engaged in various material-supported practices of bringing fragmented data into a more organised form that was verified and checked for accuracy and completeness. They referred to these tools as getting consistency and accuracy support, suggesting their materiality was essential to check and sustain data accuracy, as mentioned by respondent 8:

I then set the strategic charter to bring fragmented data from different businesses and systems into one centralised depository as a single source of truth for everyone to derive insights and intelligence for the business. We have started that process to document, audit and create a data dictionary so that we can honestly know what should go in that field.

Respondent 8 faced a challenging situation regarding the quality of the existing data in the organisation. According to respondent 8, data inconsistency was mainly because the businesses had grown, and there were many disparate systems through which data was managed. For communication and alignment, having a single and up-to-date source of truth regarding the data was critical. She performed a five-c assessment of the data for its correctness, currency, coverage, completeness and consistency.

In situations where no data was available, analysts came up with various means to gather data, such as templates, so that the data could be collected from the businesses in a structured manner. This is seen in respondent 17's explanation below:

So, to make sense of the data in the first place means, alongside extracting data from our HR database, it was essential to get data from each of the different offices not integrated into the HR system through a structured Excel sheet.

When completing the talent profiling of the management team as part of the talent mapping exercise, respondent 17 faced a situation where data within the HR database was unavailable due to a lack of an integrated HR system. Respondent 17 decided to develop an Excel template to collect data from multiple offices. The purpose of this template was to ensure that the data collected was complete and structured uniformly across the organisation from different offices. The structure of this template was carefully developed to enable the required data to be captured. Apart from ensuring data completeness, according to respondent 17, one of the main reasons behind these cues extraction and optimisation efforts was accurately reflecting the views of the senior management in those respective offices.

The materiality facilitated sorting specific cues into categories based on perceived similarities and differences. In this respect, the embodiment of data and cues in material form enabled the organisation of the data by allowing HRAPs to consciously and collectively assign ambiguous categories meanings and develop new categories from discovering similarities and differences in data and cues (categorising and organising). HRAPs were engaged in cognitive practices of categorising and organising the data, for example, through coding, to ensure the extracted could be put into action for sensemaking most effectively and efficiently, as mentioned below by respondent 6.

I had to segment the data based on different academic units, functional areas and patient care areas. So, I decided to code the data to help me better understand it. This coding is combined with the warehouse data to get a complete sense.

Respondent 6 faced a situation where he had generic job titles, and there were multiple employees in those titles, and it was not always clear, from a central office perspective, what their day-to-day operational role was. Relying only on job titles would have misled the analysis as some job titles did not accurately reflect the job's nature. Respondent 6 developed an alternative way to understand better all academic and patient care staff's roles, responsibilities and functions. He decided to go beyond their job title and coded the jobs based on job families, and these codes were used to segment various positions for analysing the financial impacts of these jobs during lockdown situations. This coding facilitated segmenting the workforce in ways that job titles do not accommodate.

From a financial impact perspective, through this coding, respondent 6 drilled down to individual employee levels to calculate the per-head saving by the university hospital in the event of support from the government for some eligible employees. The example shown by respondent 6 involved looking at some of the code values and consolidating them to make them more relevant. The other example provided was that sometimes, while ensuring the integrity of the original data, there was a small amount of recoding done after getting input from the business operation team to simplify and standardise things to make more sense for the user to be able to interpret the data.

These coding and recoding practices were materially supported by connecting mental frames to the material processing and thereby achieving the function of categorising and organising. These categorisations helped respondent 6 to prepare different scenarios and project them to management to help them make informed decisions regarding prioritising and understanding how these decisions potentially impact the hospital's clinical, research, educational and other operational missions. For example, respondent 6 demonstrated the impact on different categories of employees being kept on furlough and how long these employees could survive with no or a reduced income.

HRAPs engaged in a series of practices to optimise data mining and subsequent analysis through standardised workflows and instruction. Actualising these standardised workflows and instructions supported HRAPs in achieving various goals, such as eliminating manual tasks to increase speed and accuracy. Also, the tools' interactive features guided HRAPs through the required steps. Thus, the affordance of these workflows and instructions could reduce errors and increase results' quality, accuracy and consistency. While these are essential benefits, equally crucial in hindsight is that actualising the workflows and instructions provided the enabling conditions for additional affordances, such as analysis and interpretation. Different tools were put into practice to create workflows and instructions to achieve automation to mine and analyse large volumes of data, as mentioned below by respondent 8:

> *The great thing about the tool [Alteryx] is that it can be applied to multiple data sets once you create a workflow or work instructions on the data set*.

Respondent 8 had to compile and clean many data sets from different sources, so she used a software tool for data mining. She went through all the data parameters she wanted to map and applied workflows and standardised instructions to the multiple data sets through this software to obtain the desired output. Respondent 8 performed multiple analyses of data from various sources through this tool. Because running multiple versions of a model with parameter changes had become more manageable, respondent 8 compared the results through multiple versions. She focused more on data interpretations as the collation became more manageable and standardised.

6.4.3 Engaging Stakeholders through Appropriate Visualisation

The findings suggest that visualisation tools (VTs) were practised throughout the analytical process; they became increasingly used for engaging and persuading rather than merely informing. While doing so, HRAPs used these VTs to translate verbal and visual information while considering various constraints and implications.

This material engagement with VTs also supported analysts in visual information processing, such as explaining relationships between variables and linkages between multiple pieces of information. Furthermore, data visualisation support enacted by HRAPs also facilitated the audience to see and comprehend data trends, relationships and patterns quickly and easily. The visual imagery alluded to experiences of engagements through VTs, which helped HRAPs evoke meanings and interpretations and steer the audience in the desired direction. HRAPs also pointed out that, with the help of this visualisation support, they could minimise the risk of the audience misinterpreting information, missing important conclusions or spending too much time trying to understand the data. In addition, these VTs allowed HRAPs to receive and accommodate stakeholder feedback during the engagement process. They also persuasively supported analysts to drive change, support the stakeholders in decision-making through the feasibility of different options and implement the recommendations.

The intent and purpose of the insight that needs to be communicated dictate the visual presentations. HRAPs suggested using the “form follows functional intent” principle to convey complex ideas with greater clarity, precision and efficiency. The findings indicated that data visualisation is about the thoughtful conversion of the data story into a visualisation to share insights smartly, accurately and aesthetically. HRAPs mentioned that experience had taught them that jarring colours, imbalanced text and number and graphic features, faulty scale or design could either distort the data or make it too hard to consume. As HRAPs attempted to visualise various elements of their findings, they systematically engaged in practices that involved the production and/or manipulation of VTs to support visual representation through appropriate “form”. These practices supported the realisation of HRAP's intent to effectively engage the audience to convey a sense. With the support of a VT, HRAPs were able to create simple graphics that showed what was necessary by excluding unnecessary visual elements that were confusing and distracting, as shown and explained by respondent 5:

As evident in my slides, I have attempted to strike a delicate balance between text and numbers without bogging them [the audience] down with many numbers or texts they may not understand. This means prioritising and cutting away all that is not needed, like letting shine those results that mattered and highlighting them.

Respondent 5 acknowledged that she was tempted and was under pressure to report everything. However, as she moved further in her analysis, she found that it could be misleading to convey excessive details. Some elements had such a small effect there that it did not make sense to have managers focus on those at the expense of other results with much more significant effect size, which also happened to be substantial. It was a judgement call for respondent 5 to report what was more relevant to the managers and lead them in the right direction. To have the proper focus of the managers on her tables of findings, she highlighted areas in different colours, such as green and red, to represent movement in a different direction.

The findings suggest that HRAPs used simulations to amplify real experiences with guided ones that evoke or replicate substantial aspects of the real world in a fully interactive manner. Results have shown that different material arrangements allowed the creation of additional conditions for HRAPs to be exploited to support their cognitive and discursive functions. The materiality feature of simulation provided HRAPs with a foundation on which various options were evaluated and tested through multiple scenarios by providing information on each scenario's implications. In this way, HRAPs could favour or shape past assumptions for self and others.

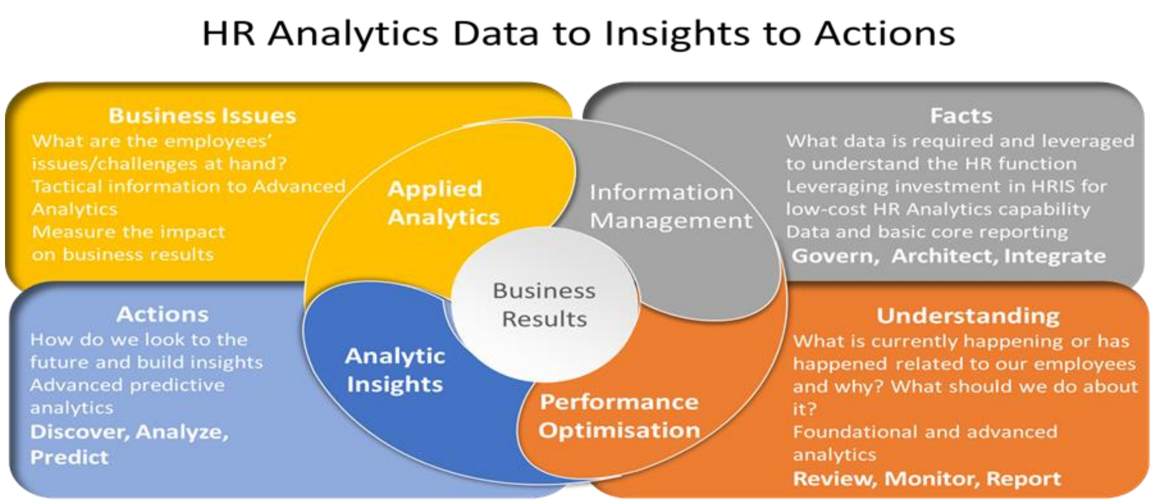
The researcher observed that the simulation affects both the process and nature of sensemaking and sensegiving in action. It provided in-depth analysis and opportunities for HRAPs to make and give a sense of new possibilities and discover alternative courses of action. It further allowed HRAPs to facilitate the audience to play with multiple scenarios. Shifting the simulation process to a 'what if' model allowed the HRAPs to observe the possible impact of the numerous scenarios and combinations, as depicted below quote from respondent 11:

We ran a simple optimisation exercise building a decision tree that showed them that, for certain positions of a specific type of relationship, you are better off going for certain combinations of inexperienced with experienced hires. We used simulation for the leaders in Excel to show them various combinations of profiles and how these combinations will impact their net promoter score and customer satisfaction levels for their clients over time.

To demonstrate optimisation of the three relationship manager profiles and their optimum mix, as part of mindful actualisation of tools, respondent 11 has shown how he has put up a decision tree to help senior management find the right combination and how they could optimise it for both financial and customer outcomes. This simulation was performed in Excel as it was fast to develop and demonstrate, and each manager could play with various combinations on their laptops. Respondent 11 explained to senior managers how changing parameters and variables and their combinations could impact the outcome of their decisions. For example, one of the variables was relationship managers' level of risk aversion or risk affinity. Senior managers could see how having more risk aversion or affinity would impact the financial value added per client or the net promoter score using different combinations.

Respondent 11 gave sense to his stakeholders through the mindful actualisation of tools by influencing their sensemaking. He could craft the right storyline through these simulations for his findings. The simulation supported him in driving home the message of having the right combination of relationship managers with their unique strengths. Respondent 11 also found the simulation helpful in establishing how managers must adjust their recruitment processes to achieve specific targets, why they need coaching and mentoring relationships with their team members, and how it could help them develop the right combinations of relationship managers. Overall, the simulation helped to craft a compelling story that made sense to managers intuitively.

As part of materialising the ideas, the researcher was shown various artefacts such as whiteboards used while interacting with stakeholders to collect and understand their context and their requirement to translate the verbal ideas into concrete cues. For example, respondent 8 showed each stakeholder's requirements on the whiteboard she collected in a meeting. This listing constantly exposed her and the stakeholders to their reminders, facilitating the (often unconscious) retrieval and re-use of the cues and ideas they embodied while engaging with them. HRAPs considered the assembled cues through such artefacts essential to constructing new understandings as these cues allowed them to translate verbal ideas (often ambiguous) to concrete cues. Respondent 8 could then more easily bring these ideas and priorities back into the discussion and effectively integrate them into emerging interpretations, resulting in an HRA strategy (see Figure 6-3 for extracts).



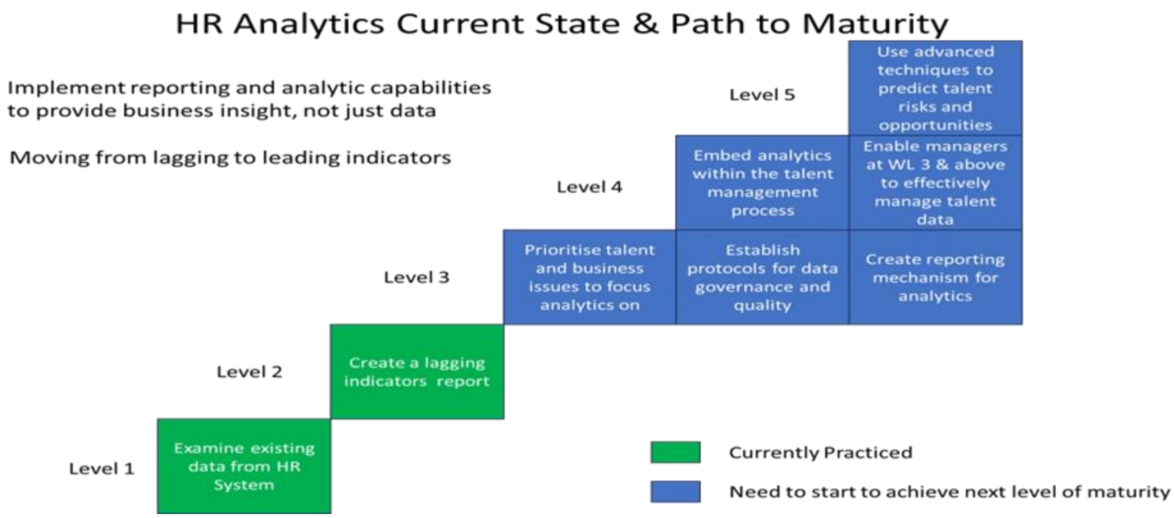


Figure 6-3: Extracts of Human Resources Analytics Strategy

The findings reveal that, through interactive features of the tools and artefacts, such as dashboards, HRAPs could engage stakeholders to help them play with their different scenarios and then accordingly draw inferences. HRAPs put the visualisation features of the dashboards into practice to give the entire data output in real time, representing it in language and imagery to enable stakeholders to draw inferences and make decisions. Behind these dashboards were integrated databases, usually through ERP systems coupled with business intelligence software, to monitor the flow of information. Stakeholders could slice and dice and apply filters to various fields to get insights as they would like to see, as respondent 8 mentioned below:

So, we built some dashboards of the data within the system to see their population by filtering and slicing the information in a way that makes sense to the users.

Respondent 8 built dashboards integrated with the ERP software and other data sources to help increase awareness around data and its utilisation for decision-making (please see Figure 6-4 for illustration). These dashboards first allowed her to organise her work and helped her access and make sense of the available information. The visualisation made her sensemaking process more emergent and followed the pattern and flow of the work. From a communication perspective, these dashboards were made accessible to the business and were very interactive. She added multiple filters that allowed the business to slice and dice data based on their needs, which varied across the organisation. Some users wanted to look at the data by department, some by business unit and others by cost centre. To drive the user's sensemaking, she created an info button on the dashboard to give the background information about the data utilised to generate the reports. This information button also guided the users about the data source and who needed to be contacted to obtain further information or clarification.

Figure 6-4: Human Resources Dashboard Illustration

Findings also suggest using dashboards and metrics for communication and alignment across the organisation as part of analysts' sensegiving. The visualisation through these dashboards and metrics supported the HRAPs when giving sense to the broader population. It enabled the users of these dashboards to figure out how to respond to particular situations in their unfolding work. As such, it allowed them to gradually develop patterns of how to react to future events, thus ensuring alignment. These tools also facilitated HRAPs to encourage stakeholders to use data for their decision-making and, in doing so, helped build their data literacy and capabilities, as mentioned by respondent 29 below:

> *I used dashboards for communication and alignment. We kept them engaged by equipping them with the tools to analyse their data.*

As pointed out earlier, HRAPs and their stakeholders actualised the affordances of dashboards and metrics, providing an opportunity to make and give a sense in a relatively consistent and standardised manner through which they had visibility and transparency of data throughout their organisations. The HRAPs noted that their sensegiving practices through these dashboards continued without actively interacting with the stakeholders. The artefacts served as an intermediatory medium through which sensegiving continued. In addition to the above opportunity, the affordance also allowed HRAPs to monitor the utilisation of their dashboards and metrics, i.e. overall efficacy. Additionally, it also made it possible to evaluate the effectiveness of sensegiving through these intermediatory tools via monitoring their utilisation and effectivity, as stated below by respondent 29:

I monitored the utilisation of dashboards through a utilisation report every quarter. Moreover, if there is data or a dashboard element that is little used, I will go back to the business asking why there is low utilisation to make dashboards more relevant.

After publishing the dashboards, respondent 29 decided to monitor the utilisation every quarter to ensure their relevancy. The dashboards allowed him to receive rapid user feedback, enabling quick probes and experiments. Working with users this way gave him a rich and vivid sense of how the dashboards are perceived and how they can be improved and improvised. These connections and feedback lopes inspired further improvements and occasionally revealed new experiences until the HRAPs felt confident enough in their emerging interpretations to present them to their stakeholders. As HRAPs engaged in sensegiving, they collected feedback that prompted them to refine their emerging interpretations. For example, in areas of the dashboard with low or no utilisation, respondent 29 returned to the business to understand the reasons behind this low utility and asked if there were different data requirements. As a result, in some cases, he retired some dashboards because they were not helpful for various reasons and added some new ones based on the business's needs.

HRAPs deployed a range of TTAs to support their storytelling through data as part of material practices. Using appropriate visuals has been observed as a critical practice supporting discursive storytelling practice. HRAPs conceived visualising their narrative by displaying previously produced material organised into a PowerPoint presentation. In essence, the practice of visualising narrative consisted of the collective preparation of a set of slides that would be used to present insights to the stakeholders.

Visual representations became part of a broader persuasive narrative about interpreting and using the data by taking advantage of established storytelling principles. For example, the visual presentation of information in a schematic form (using charts and graphs) to represent statistics, facts or figures allowed the insights to be more of a conversation than a monologue. Furthermore, narrative visualisation is a materially supported practice of sensemaking overlapping sensegiving, where HRAPs constructed plausible explanations of their interpretations and conveyed insights as part of sensegiving. Appropriate visual support was cited as one of the critical elements to craft a compelling narrative around the data effectively, as mentioned below by respondent 2:

Because it is like aiming for brand recognition or attention space in the head of your consumer, and it is like that, you have to make it a short, sweet, simple message through smart visualisations, which they understand they can move on with, right? You draw your audience's eye directly to the matter using colour to organise and format your data.

The narrative visualisation relied on visualising tentative linkages among emerging mental structures through the arrangement of insights in an intuitive manner. While crafting the story, HRAPs used selective visualisations through graphs, pictures, tables, colours, etc., to reconstruct a plausible line of interpretation. Respondent 2 mentioned that he needed to keep his findings relevant and straightforward as a few senior management team members were not closely following the analytical process. He organised and planned his analytical story simply enough for these team members to understand. It was not only his ability to understand and interpret;

instead, it was more about these senior management team members. He kept one theme per slide and removed the clutter to ensure this. He used intelligent visual cues such as staffing trend lines to identify and confirm trends between the number of staff and related HR activities.

Respondent 2 identified where staff numbers were in excess/short/optimum level of what was required through the trend line. Data visualisation was necessary to engage stakeholders as it allowed insight to be more of a conversation than a monologue. He engaged his stakeholders and captured their attention to the critical insights by staging the required conversations by drawing attention through appropriate visualisation.

Table 6-4: Data Structure Navigating Paradoxes

<table>
<tr><th>Activities Repertoire First-Order Codes</th><th>Second-Order Sub-Themes</th><th>Themes</th></tr>
<tr><td>Thinking Pragmatically
Practical Implications Vs Academic Implications
Customer Focus Vs Analytical Focus
Aligning Analytical practices to organisational needs</td><td>Merging best practice and best fit</td><td rowspan="4">Navigating paradoxes</td></tr>
<tr><td>Keeping Long Term Focus alongside Short Term Focus
Drawing on a strategic picture
Operational and Strategic requirements are different sides of the same coin
Aligning the operational and strategic needs of the organisation</td><td>Driving operational and strategic agenda together</td></tr>
<tr><td>Continue adjusting and adopting
Negotiating the demands between accuracy and speed
Maintaining the analytical project momentum
Drawing on material support for speed and accuracy</td><td>Delivering with accuracy and speed</td></tr>
<tr><td>Managing between the right brain and left brain for self and other
Drawing on business cases to help understand data utility
Acknowledging intuition when driving insights through data
Balancing data and intuition during analytics projects</td><td>Bringing data in support of intuition</td></tr>
</table>

6.5 Navigating Paradoxes

The research findings reveal that HRAPs sought to manage contradictions and paradoxes while examining new data and perspectives in a dynamically complex context. Navigating these paradoxes and contradictions became central to HRAPs' sensemaking, sensegiving process. HRAPs face complex and evolving environments, so the conditions are ripe for the experience of contradiction, incongruity, incoherence and ambiguity. For example, some contradictory yet interrelated practices seem logical when viewed in isolation but may appear irrational and impractical when appearing simultaneously. According to HRAPs, managing these contradictions involves recognising and accepting these paradoxes and then managing them constructively. The findings also showed that the very nature of this paradoxical experience prompts further sensemaking as HRAPs seek to bring some order and coherence to their sensemaking and sensegiving accounts. The data analysis structure of ‘navigating paradoxes’ is outlined in Table 6-4.

6.5.1 Merging Best Practices and Best Practices

When discussing the implications of their recommendations, the HRAPs remained open to the embedded dichotomies in analytical practices. The findings indicate that, for HRAPs, it is not just a matter of interpreting and translating the analysis into conclusions but also merging best practices with the best fit by having a complementary approach. Under complexity, the HRAPs are pragmatically aligned with the situational demands that often lie between these contradictory positions. For example, stakeholders generally have a pragmatic interest in understanding what is practical and workable in the given context, as they are more interested in addressing the immediate problem in a time-bound manner. In contrast, HRAPs are keen to explore the options of best practices to find solutions to the organisational issues at hand. To illustrate this, respondent 5 mentioned:

There was a lot of balancing between the best practice and what will be relevant to the organisational context for practical purposes. In other words, it is a case of bringing together a best practice for its application in the prevailing context.

Respondent 5 faced a very complex and novel context that she was keen on exploiting as the source of learning. Many parameters were changing, particularly the public health situation and its impact on individuals. Interpreting findings in this complexity was a real challenge and learning experience for respondent 5, particularly attempting to merge the best practice and best fit in the face of practical challenges. Respondent 5 admitted that, on the one hand, she was pulled towards practical significance, i.e., best fit; on the other hand, it was also the case of assessing the relevance of best practice in this evolving context.

Respondent 5 brainstormed with the line managers, who were responsible for improving their team members' engagement when working from home. She looked at many different subgroups of variables, departments, and functions in the organisation to make reasonable conclusions with scientific accuracy when making recommendations. According to respondent 5, this was not an easy situation as sometimes she was presented with data sets offering tremendous opportunities for everything to be significant. However, she was keen to filter down these opportunities through her professional judgement and negotiations with the managers based on her experience to be most meaningful and practical to present the opportunity for change for the organisation.

Furthermore, the analytics process demands that HRAPs embrace being both rigorous and staying relevant regarding the practical implications of their findings. The quote below from respondent 4 stated that this challenge triggered him to adopt a reflexive approach through practical significance while ensuring rigour to guide him to navigate this challenge of being rigorous and relevant.

As [an] analytics professional, I had to meet the dual hurdles of being relevant and rigorous in my analytical approach and results. However, this is easier said than *done, as an analytics project is assessed regarding how well it has addressed the problem or issues for which it was intended, not the rigour alone. For me, it was practical significance guiding me through these hurdles.*

To make his findings relevant for practical purposes, alongside statistical results, respondent 4 referred to the idea of practical significance guiding his interpretation to stay relevant and serve the intended purpose of the analytical task. At the same time, he needed to ensure the rigour of the analytical methods producing the results. The real question in front of respondent 4 was how significant those findings were for the impact they could generate in improving employee engagement in case management wanted to implement them. The rigour aspects were validated based on their significance level to ensure that results reflected the reality and their practical significance. According to respondent 4, he was keen to take some practical judgement calls when assessing the practical significance of consultation with the business. Overall, it was a matter of taking practical significance on top of interpreting the statistical results and saying, “Ok, this says it is predictive, but it has barely had the strength for being predictive when it comes to practical significance in the overall context.”

6.5.2 Driving Operational and Strategic Agenda Together

The findings also indicated that HRAPs were required to oscillate between their operational and strategic agendas and often compete for resources and time. HRAPs pointed out that ignoring one at the cost of the other is often not an ideal way forward in organisational settings. At the same time, pulling both operational priorities alongside strategic ones is a challenging experience, as the resources required for both are often not necessarily available. Consequently, managing while juggling with these priorities has always been a challenge for HRAPs, as indicated below by respondent 6:

I and other HR, IT and Finance members were actively trying to implement new HR software that will go live in July of this year. Managing priorities to respond to *this rapid development analytical and keep implementation on track was a challenging experience in this situation.*

6.5.3 Delivering with Accuracy and Speed

In an analytical context, the accuracy of the data and relevant findings is an important parameter to be considered. HRAPs usually do not like compromising accuracy, even if it takes longer to chase accuracy, but the situational demands must be factored in accordingly. According to HRAPs, data accuracy is sometimes challenging due to time constraints. The analytical projects are time-bound and are expected to be delivered in a specific time frame, which at times may push analysts to compromise on accuracy, but within certain limits, which need to be acknowledged and then managed, as mentioned below by respondent 6:

Do not let the perfect be the enemy of the good. So, as much as we like to have precise, perfect data, it is not realistic in this environment. And then, from the data management perspective, I always look for more effective and efficient ways to combine datasets and minimise the work, the amount of time needed to do that, and the required spot-checking of the data sets.

Respondent 6 was confronted with a unique situation where there was an immediate need to produce reports and analytics to help the business make informed decisions, but, on the other hand, the organisation was implementing new HR software. This implementation consumed respondent 6, HR and Information Technology team members. He faced the dilemma of whether to focus on the daily operational requirements of producing analytical reports as requested by the management or on implementing the new HR software. From an organisational standpoint, both priorities were vital to the strategic analytical agenda. This would mean he was expected to address the stakeholders' immediate analytical needs and set up the data for software implementation. Respondent 6 applied means-end logic to reframe the issue; he sought a link between the demands, which would require moving from an either/or decision towards a both/and perspective as he decided on his priorities and looked for initiatives that could be common to both. For example, his organisation-wide coding initiative helped him implement a new system and manage the immediate requirements by rallying the right resources for immediate and relatively long-term needs.

Due to data management challenges, respondent 6 realised that obtaining perfect and accurate data and analysis may not be available at the first attempt. Understanding this limitation and working around it was integral to his sensemaking. Project requirements made him strive for more effective and efficient ways to manage varying data sets and their combination to achieve results. With very little time, respondent 6 was pushed into finalising reports that were not 100 percent accurate or complete. He was prepared to send out these reports and analyses with the caveat that data accuracy was not 100 percent. Obtaining accurate data for analysis purposes was time-consuming, and he was short of time. For respondent 6, balancing accuracy versus speed was the real challenge. He was prepared to compromise on the data accuracy and willing to return to it and fix it rather than wait to achieve 100 percent accuracy. This sense of ownership to understand the gaps in the data accuracy and its implications and then being prepared to fix the issues was a learning experience for respondent 6.

6.5.4 Bringing Data in Support of Intuition

The findings indicated that HRAPs are confronted with the challenges of changing the mindset of their stakeholders and bringing them up to speed with using data when making decisions. Generally, managers are comfortable with their management judgements and intuition, developed through their experience, when making decisions. While sharing their experiences, HRAPs mentioned that expecting managers to move away from intuition and make decisions purely on data was not always an easy outcome. In his analytical approach, respondent 24 released that, to manage this change of mindset in General Managers (GMs), he needed to understand reflexivity as a way of thinking differently and improvise his sensegiving method, as reflected in the below quote:

Furthermore, on the people front, I realised that building a technical model is one thing, but convincing the stakeholders is another, particularly in a context where business leaders [GMs] make decisions based on their intuitive business awareness.

For respondent 24, it was a challenging experience to build a forecasting model for the business audience, who were historically more reliant on gut feel. While reflecting on his experience, respondent 24 mentioned that he was up to the task regarding the forecasting model's technical aspect. In terms of convincing stakeholders to use the model, this was a good learning experience as he had the opportunity to influence GMs regarding the model's efficacy. Thus, instead of completely ignoring managerial intuition, HRAPs tend to negotiate the common ground wherein they encourage managers to bring out their intuition-based assumptions and then support them using data alongside their intuition.

In addition to working on changing stakeholders' mindsets to bring data to support intuition, HRAPs also mentioned their reflexive approaches to intuitional thinking when crafting stories. Alongside staying agile and adjusting and adapting to the context and project dynamics, respondent 11 likewise highlighted the design thinking approach as a framework for reflexivity to bring his intuitive thinking to the front when presenting findings.

So, I think design thinking was more of a process for me to move away from our left brain, which is very cold, rational, logical, and connects with the more visceral, intuitive side of our brain as part of our analysis that we could present to managers and leaders.

As part of respondent 11's reflection, he acknowledges that design thinking helped him move from the left to the right brain, broadening the horizon to think intuitively. This intuitive thinking enabled him to prepare the messaging better through the storyline to present it to managers. Through intuitive thinking, he could better connect with managers' thought processes and influence them as part of sensegiving.

6.6 Performing Reflexive Conversations

The central theme that emerged in HRAPs' sensemaking and sensegiving was their reflexivity through performing reflexive conversations with self and others, which became part of their role. To fulfil their strategic responsibilities, the HRAPs reflexively draw on their repertoire of cognitive-discursive activities while attending to their diverse knowledge structures and prevailing context to craft new and compelling accounts that rise above their past frames when needed. The findings suggest that HRAPs' sensemaking and sensegiving characterise the blending of sufficient complexity of thoughts to notice and register the cues in a complex situation with the necessary simplicity of goal-oriented actions.

Reflexivity provided HRAPs with the balancing act of managing the oscillation between the complexity of thought and simplicity of action. HRAPs' act of reflexivity was achieved not only through thinking backwards but also by living forward in the present moment. The findings also suggested that HRAPs were realistic about what can and cannot be drawn from past practice when confronted with complex or novel situations. HRAPS responded to these novel situations or contexts by reflexively pursuing greater flexibility in sensemaking and sensegiving practices.

The findings suggest that reflexive sensemaking and sensegiving can become enabling and empowering resources when enacted. Established frames, HRAPs' internal value systems and other pressures often contained many contradictory elements that were appropriated through reflexive reasoning to articulate and pragmatically justify various accounts of the situation. HRAPs' reflexive reasoning worked through comprehensive ‘rationalities’ with broader evaluative frameworks or ‘logics’ (Nigam and Ocasio 2010). These rationalities enabled HRAPs to work with taken-for-granted beliefs and frames and provided them and a system of thought that evaluated and justified the appropriateness and relevance of those frames and beliefs.

The accounts shared by HRAPs suggest that they engaged in reflexive practices of being aware of their words and actions, embracing learning on the go and breaking from the past frames, as shown in Table 6-5. HRAPs' reflexivity came from viewing assumptions from multiple perspectives and then questioning how they would make sense of a situation if a current belief were untrue or the context changed (Cunliffe 2002). This questioning meant creating contextual knowledge rather than pursuing dichotomous thinking with greater flexibility. Reflexive conversation and practices strengthened analysts' capacity for moving from abstract thinking to pragmatic thinking and facilitated moving from abstract thought to concrete experience as part of their sensemaking and sensegiving experience (Cunliffe and Easterby-Smith 2004).

Table 6-5: Data Structure Performing Reflexive Conversations

Activities Repertoire First-Order Codes	Second-Order Sub-Themes	Themes
Anticipating business implications Drawing on cultural nuances Avoiding the big coefficient trap Thinking and acting pragmatically Putting cue gate	Reflexive awareness of words and actions	Performing Reflexive conversations
Continuous learning and adapting Learning to deal with counterintuitive results Learning from the novelty of the experience Learning to manage personal preferences Unlearning the past	Embracing learning on the go	
Applying an inquisitive mindset Challenging past assumptions of others Questioning own assumptions Taking into consideration the contextual variation Avoiding jumping straight into the data	Breaking from the past frames	

6.6.1 Reflexive Awareness of Words and Actions

The findings suggest that, as part of fulfilling their roles, the HRAPs reflexively drew on their abilities to understand and anticipate the impact of their actions and words in the prevailing context when making and giving sense. The complexity of the analytical process and other pressures present in an operating environment often contain many contradictory elements that can be appropriated through reflexive reasoning to articulate and pragmatically determine what words and actions need to be chosen. The reflexive awareness of the consequences of words and actions can become enabling and empowering resources for reflexive sensemaking and sensegiving.

The findings suggest that HRAPs' reflexive awareness worked through comprehensive rationalities by initiating the internal dialogue, enabling them to work through the situation and providing them with a system of thought that evaluates and justifies the appropriateness and relevance of their actions and conversations. The focus got broadened to the activities or the talk and mapping the effects produced through different actions and words. Such an orientation assisted HRAPs in noticing the consequences of their actions and facilitated making these context-specific assessments about what may work best in a specific situation.

A wide range of reflective and reflexive routines and practices were layered in HRAPs' sensemaking and sensegiving practices, including informal discussions with other team members immediately, learning/reflecting based on experience, openness to modifying the assumptions, dealing with counterintuitive results, invoking creativity and being pragmatic. The findings showed that HRAPs were involved in in-the-moment awareness, honing their attention on what was happening here and now, and anticipated the impact of their actions and words to discover a pattern of connections and distinctions. The analytics process demanded that HRAPs reflect on their analytical approach. Respondent 8 provided an interesting metaphor representing her reflexive approach, as reflected in the below quote:

They say for people to build things, measure twice, cut once, precisely; it is the same in any analytics project you are doing.

According to respondent 8, it was vital to appreciate that while making sense of the situation, it took time for her to understand the questions she was trying to answer and why. She acknowledged that she could not fix everything in one go and considered the implications of various actions and options. For example, respondent 8 was working on providing a dashboard where available data had to be checked for accuracy and completeness. She had to choose between cleaning the entire data set for all the businesses and then developing the dashboard versus cleaning the data in parts and releasing the dashboard. Respondent 8 decided to prioritise the dashboard requirements in phases and accordingly prepare the data to be used in the releasing section of the dashboard. In this way, she kept improvising the dashboard and improving the quality of data in it while at the same time offering dashboards to the business. Appreciating the sensitivity around the time taken to produce the complete dashboard was critical as some businesses were keen to have a dashboard on priority.

The findings suggest that the HRAPs drew on the cultural nuances of the organisations before deciding on their actions and outcomes. Thus, HRAPs found reflexivity of questioning and anticipating the impacts of their activities as a process of opening themselves to these nuances to expand the opportunity to read the context of analytics proactively. Such reflexivity enhanced the HRAPs' ability to operate while being mindful of their actions and impact when making and giving the sense, as highlighted in the below quote from respondent 29:

You have got to make sure you can move away from the pilot syndrome, if you know what I am trying to say. To be successful, it is always better to show than talk, so I decided to move on with a stepwise approach to dashboard development and publishing.

Respondent 29 was cautious about getting sucked into the concept of pilot syndrome for publishing the dashboard. This could have put her into a situation of long discussions and then doing pilot dashboards before publishing the final version of the dashboard, but no actions. The organisation did not have a very good experience, as it had two failed attempts to provide HRA dashboards to the managers. Considering this history of failed attempts and managers expecting actions instead of talking and hoping, she decided to go step-wise, showing the value of the dashboards based on the initial expectations and then gradually moving on to the advanced versions. According to her, in this way, stakeholders could see the value and impact of the dashboard and how it could help them to drive change and the mindset to utilise data for decision-making within the company gradually.

The findings highlight HRAPs' awareness of cognitive biases influencing their interpretation and subsequent actions. According to HRAPs, it is very easy to get drawn into some predispositions which can negatively impact results. Recognising that a bias may exist through internal dialogue and accentuating the cognitive facet of handling it was an essential element of analytical work. Accordingly, HRAPs either mentioned it in their data narrative or mitigated it from the analytics through a well-thought plan, as reflected in the below quote from respondent 11:

I was conscious of a big coefficient trap and adhered to abductive instead of deductive thinking.

As part of his sensemaking experience, respondent 11 drew on the ability to understand the impact of actions and words and shared his learning of putting them into action, being mindful of the big coefficient trap. He explained that, when running the optimisation model, the net promotor score popped out as highly predictive or strongly related to the success of the relationship manager. According to respondent 11, it was pretty tempting for him to base the entire recommendations around that one variable while other variables also warranted his attention. This situation required him to move from deductive to abductive thinking while ensuring the validity and reliability of his results.

In organisational settings, managers have pragmatic interests in understanding what works regarding various interventions. For HRAPs, it is often not just a matter of interpreting and presenting findings as part of the analytical project but of managing the trade-offs between the different recommended action points in consultation with the stakeholders. The findings revealed that reflecting on the sense made and reviewing it in the light of practical implications seems to be a way to go in a dynamic and complex process in organisational settings. HRAPs pointed out numerous situations where they had to think differently or pragmatically. In these situations, reflexivity became the method of feedback that required them to act pragmatically, as acknowledged by respondent 5:

I might have a slightly different focus that helps to use that judgement based on what I know is possible, being pragmatic. If something like it is hard to change, or, you know, it is out of the realm of control of management, then it is probably better to focus on something of more priority. I adapted to these challenges and was pragmatic throughout the project.

According to respondent 5, she acted pragmatically when crafting a compelling analytical story that is in tune with and relevant to the context. Respondent 5 had to make many judgement calls when prescribing practical recommendations under management's direct control and influence. She realised that many variables could influence burnout, and there is much spillover between them. She quickly appreciated that it would not make sense to measure, analyse and try to recommend doing anything about employees' home lives, personal relationships or marriages. She mentioned it was an overstep for the management to think about these private matters at this stage. According to respondent 11, it did not make sense to analyse these personal matters even though they might significantly predict burnout, as management wanted only to focus on what could be controlled and influenced by them within the organisation. Eventually, with these practical judgement calls based on reflexive reasoning with self and managers, she could craft an analytical story relevant and practical in the prevailing context.

The findings suggest that the HRAPs relied heavily on their assumptions as part of making and giving sense. There were multiple sources of assumptions, including the organisation's environment and the various operating variables related to the area of operation. According to HRAPs, their ability to operate effectively depends on their awareness that their environment is ambiguous and uncertain, and, as a result, organisational members may not make accurate assumptions. They were required to question these assumptions as part of their sensemaking and sensegiving efforts. Thus, in addition to the traditional approach of interpreting their own and others' beliefs, HRAPs were required to have a second mode of validating and exploiting them to their advantage, as highlighted in the below quote from respondent 2.

> *So, I would just put that cue gate before, as I feel it prudent to check the assumptions and factor them into my interpretation and subsequent story.*

As part of reflexivity, respondent 2 mentioned that it was essential to question the assumptions, as challenging the underlying assumption was like a cue gate for him. Before presenting the analysis to senior management, he found this as a cue gate in the form of a sense check for the underlying assumptions as prudent. This sense check helped him establish that his inferences were logical and that the analytical story made sense in a given context.

6.6.2 Embracing Learning on the Go

HRAPs were often confronted with situations and events where they must embrace learning on the go as a reflexive feeding-back approach to navigate through their contradictory experiences when making and giving sense. They found reflexivity as a way of embracing learning on the go by being flexible, adapting to the situation, and making judgment calls regarding what matters and what does not matter. While making these calls, they also felt that sometimes they had to rush due to paucity of time and did not carry out as good a process. They were open to learning on the go and improving their ability to operate in complex situations. HRAPs shared their experience that sometimes trying something that is not accurate is better than waiting to have 100 percent accurate data, which might take longer and delay the action taken. When the complete, accurate data is analysed in depth, the issue may have passed, and inaction from the management may not benefit the organisation. HRAPs were conscious of timely response/s to organisational challenge/s based on the best available evidence through data, as indicated by respondent 21.

I think, as analysts, our job is to advise the management based on the best available evidence and ensure learning and updating.

Similarly, HRAPs act on their past learning when making certain analytical decisions and keep updating that learning as a result of their ongoing experience. For example, respondent 5 was initially keen to examine benchmark data, but, in her prevailing context, based on her previous learning, she was cautious about drawing lessons from the benchmark data as her context was quite different, and there was no benchmark data in the crises such a COVID-19. As part of the role, HRAPs shared their practices of continuously adjusting and adapting to the demands of the analytical project. All HRAPs shared their common feeling that they had never encountered an analytical project where they started the project with question/s or scope that never got improvised/changed as the project continued. According to HRAPs, the analytics project often throws up surprises, and they need to be flexible, keep themselves open to these surprises, and eventually learn from them. Thus, reflexivity accentuates HRAPs' readiness in anticipation of discovery and surprises while staying in the middle of the action, as reflected below in respondent 11’s quote:

The other thing I thought was important was keeping the analytics team honest by following the agile process. You cannot just leave the analytics team to run off a standard project. When we put the team into Agile Project environments, it *became easier to deal with surprises through constant learning, adjusting and adapting as you go through the data.*

While reflecting on his experience, respondent 11 was prepared to learn from surprises and stay honest with himself in continuously adapting and adjusting his sensemaking and sensegiving approach when working on the project. He was ready to move away from the conventional and standard approach to managing his analytics project and instead adopted agile methodology, allowing himself and the team to adjust and adapt to the project needs and demands continuously. When respondent 11 initially looked at the project's parameters or mandate, he thought it would be a straightforward exercise of producing a profile of a successful relationship manager, as optimisation was never on the radar. He thought it would take two weeks to prepare his findings. Respondent 11's sensemaking experience was a classic case of being reflexive and learning on the go through the data and discovering new ways to interpret the data.

The findings also reveal that, while HRAPs reflexively brought their intuitiveness into play when interpreting data, they also confronted some counterintuitive results from the data, which was a source of learning, as mentioned below by respondent 6:

So, I feel like the most significant piece I learned was that, sometimes, your data does not always tell you exactly what you think it is going to. Sometimes, the results are counterintuitive. What was surprising and counterintuitive was that certain areas moved faster than I thought they would. Thus, it was kind of the reverse of what I expected.

According to respondent 6, sometimes, as an analyst, one needs to deal with findings that seem counterintuitive. Data can throw up unexpected results, and the analyst must be prepared to deal with these surprising findings. Respondent 6's openness and readiness to grasp these counterintuitive findings allowed him to reflect on his findings and then ensure findings stayed validated and relevant. He also acknowledged that these counterintuitive results facilitated him to build his sensemaking and sensegiving repertoire, which could help him deal with future experiences. His reflexivity enhanced his ability to spot those results, embrace them and be prepared to revise their interpretation.

The findings suggest that analytics sometimes throws up novel and emergent situations where information is often incomplete, fragmented or even contradictory, posing significant challenges for framing and interpretation. While HRAPs' sensemaking accounts suggest that interpreting such information into sensible accounts is driven by plausibility, at the same time, analysts' ability to learn from their experience on the go when refining their plausible explanations, particularly in novel situations, underpinned their sensemaking efforts. Consequently, as part of the sensemaking and sensegiving experience, HRAPs were open to learning from the novelty of experience as opposed to approaching their analytical task with preconceived ideas or frames, as depicted below by respondent 28:

This is not something you have done much of the time before. This is something you figured out as you went along with the situation. This new challenge allowed me to think faster and make sense of more fluid situations.

According to respondent 28, supporting the business through COVID-19 was a novel experience for him as it was one of those situations where most of the data was not there in advance, and he was expected to make some quick decisions. He learned to deal with this kind of analytical challenge through experience. Reflecting on his feelings during the analytical exercise, he mentioned mixed feelings. He was sometimes overwhelmed with challenges; it was also a great sense of achievement on other days. This exposure helped him learn how to align the data insights to the business issues and make the data insights relevant in an evolving context. Respondent 28 also learned that, while it is traditionally assumed to be necessary to pay more attention to the analytics function and sort out the data and technology, in this project, starting with the stakeholders and the business was more important because of the evolving business situation.

Even when the experience was contradictory to personal preferences, analysts shared their frustration and challenges, but eventually, they had to adjust to the requirements of their role as they went through the experience. HRAPs were mindful of their espoused values and personal preferences, and their reflexive awareness was deemed vital when making and giving the sense, as indicated below by respondent 29:

Overall, I think it has been great. It was frustrating at first because I am extremely results-driven and operational. And I wanted to get to the end game quickly. However, I learned that it is okay not to answer all the questions in your initial brainstorming or planning session.

Respondent 29's prior experience was mainly on the operational front when managing HRA projects. With the mindset of achieving quick results, she was keen to publish the dashboard quickly. As she went through the experience, she realised achieving immediate results would not be possible, especially in a scenario where multiple businesses and the available data were fragmented and incomplete. Contrary to her knack for doing things in the past, she stepped back and ensured that she planned well before execution. She was keen to understand that besides HR data, she needed to ensure collating business data that needed to be integrated with HR data for required reporting and analysis on metrics such as productivity ratios where HR, business operations and finance data are combined.

HRAPs highlighted that their role is evolving alongside technological improvements with an opportunity and requirement to learn new tools and approaches to analyse data to keep up the pace. HRAPs' reflection and reflexivity during and after their projects offer them continuous learning opportunities. For example, according to respondent 5, the project has allowed her to challenge her past thinking on how qualitative and quantitative data inform each other and explore the benefits of mixed methods. While reflecting, she mentioned how qualitative insights supported her in interpreting quantitative work when the context was unique. HRAPs also acknowledged that learning from each experience helped them to define and calibrate assumptions when dealing with similar analytical tasks in the future. As the quote below from respondent 5 indicates, these learnings will become part of their sensemaking and sensegiving repertoire, built and updated from one task to another.

Moreover, as part of continuous learning, my mantra has always been to learn how to unlearn. The role requires me to unlearn and then learn improved ways of doing things for future projects.

6.6.3 Breaking from the Past Frames

The findings suggest that HRAPs' frames were called into action to interpret the current context and data, hoping that a past representation will provide a plausible answer to what is going on through data analysis. However, at the same time, these past frames sometimes fall short of guiding analysts' interpretation when they are faced with novel contexts and situations. To make sense of their role and the data in these emerging situations, HRAPs were mindful that they were up against a situation and a context where they may need to move away from their conventional thinking. Under such situations, HRAPs have demonstrated the practice of stepping aside and pondering what is happening around them and what needs to change in their approach and thought process.

This reflexive awareness helped HRAPs liberate themselves from past frames and question their practice of making and giving sense. Through this relaxing of the past frames, HRAPs allowed themselves to construct meaning to the novelty in the experience as it emerged. The findings highlighted how HRAPs recognised changing or novel circumstances and took them into account: how they dealt with evolving context and the surprise of the unexpected. This meant knowing what to do next amid practice when confronted with novel situations seems to rest on emptying the mind and allowing new understanding to emerge.

Findings suggest HRAPs were prepared to view the situation and data from multiple perspectives instead of developing their understanding of the situation based on past frames. As and when required, HRAPs with these breaking from past frames practices operated with less preconceived or selective perceptions of issues. With their more flexible frame structure and content, HRAPs scanned more broadly, attended to a broader range of issues, and combined information from various sources, even if contradictory. Also, it was important to recognise that, while HRAPs have drawn on their experience and education as part of their sensemaking and sensegiving practices, they have done so with an open mind, appreciating the intricacies of the novel context, as highlighted by respondent 28.

I think experience helps you understand the business problem and your question from multiple perspectives. You must have that inquisitive mindset towards analytical issues from different views with out-of-the-box thinking to apply your experience in new contexts.

According to respondent 28, his academic background and experience helped him understand the financial intricacies. For example, his financial knowledge and background enabled him to connect the dots between the emerging situation in the market with the impact on profit and loss and cash flows. Similarly, it was relatively easy for him to relate to supply chain issues due to his Business Administration degree, and those issues and concepts were not entirely new to him. Despite this, he acknowledged that, while building on his experience and academic qualifications, he had to use all that knowledge to evoke situational practices, which sometimes required him to apply an inquisitive mindset with curiosity to learn through the contextual application of his knowledge and past frames.

The reflexive practice of exposing and challenging stakeholders' assumptions surrounding business problems and challenges through questioning helped analysts execute their analytics more diligently. Encouraging stakeholders to explain the issue thoroughly helped bring their current logic and assumptions to the surface. At times, HRAPs were committed to challenging and assisting the stakeholders to get rid of flawed assumptions, as was the case in the below quote from respondent 24:

Experienced heads of business were quite comfortable with their business assumptions, which were not supported by the data. While relying on some of their premises, I had to prepare myself to question a few assumptions before persuading them to use the model.

Respondent 24 was faced with a situation where some of the GMs' business assumptions were valid, while at the same time, there were a few assumptions that were not backed up by the data. Respondent 24 had to prepare himself reflexively by drawing on data to challenge business leaders' assumptions. This reflexive practice of questioning the assumptions and then drawing on the data to frame new or revised assumptions was not a linear exercise. In fact, according to respondent 24, he was engaged in understanding and validating the business implications of each assumption.

At the same time, when HRAPs challenged the stakeholders' assumptions and helped refine their understanding of the business problem, their own understanding of the assumptions was sometimes scrutinised. Findings suggest that exposing and challenging beliefs helped HRAPs scrutinise and validate their assumptions for consequences, bringing more clarity to the problem. When considering the strategic business priorities, which often meant HRAPs reflexively challenging their assumptions, they were prepared to improve their understanding of the business's evolving assumptions. They ensured their attention was drawn to broader cues and data they deemed relevant to ensure the assumptions they planned to consider reflected the business reality as reflected in the below quote from respondent 6:

So, with things rapidly changing, I was continuously aware that these evolving assumptions needed to be factored in. I ended up changing several times, partly *because of the public health situation with the pandemic and partly because of its financial implications.*

As part of making sense, some context-specific assumptions were made by respondent 6, driven predominantly by his reflexive thinking, which demanded analysing the evolving external scenarios due to constantly changing COVID-19 scenarios. These assumptions were made explicit as a footnote to understand them completely. Furthermore, if they had changed since the last report, he mentioned them in subsequent reports.

HRAPs also mentioned taking an inclusive approach when reflecting on previous cues, frames and understanding by acknowledging data interpretations that emphasise the varying contexts. This inclusive approach became the source of a trigger for incentivising reflexivity while making and giving sense. Sticking to old structures without critical reflection can sometimes lead to errors when the context changes, as mentioned by respondent 2:

One of my learnings is to keep that light bulb on and be prepared to question your assumptions, which helps you think differently from a different company perspective. It also helped me see how decision-making happens in various organisations and experience different business contexts.

Respondent 2 mentioned that, in his analytical exercise, initially, he did not realise how a changing context can lead to changing the assumptions, as he continued with his old frames. For example, findings regarding the number of recruiters required within each business assumed that all recruitment would be done in-house. There were already overseas recruitment partners in one business, as most of the recruitment requirements were overseas for this business. The critical issue in front of respondent 2 was to factor these varying recruitment models into his analysis based on the business requirements. Also, the businesses had varying methods of calculating full-time employees due to the nature of their operations, which he had never experienced.

HRAPs are generally tempted to jump straight into the data and present some graphs and charts to the management, as that is where their strength lies. HRAPs' reflexivity also fuelled self-awareness around the temptation to jump directly into data based on previous experiences. This awareness allowed HRAPs to be mindful of this temptation for quick wins. As a result of this awareness, they decided to attend to the business context first and then move to data, as mentioned in the below quote from respondent 28:

As you progress through your analytical roles, you must forget old habits or ways of doing things, such as jumping straight into the data without understanding the business context.

Respondent 28 was mindful that there were situations where his natural tendency to jump straight into the data might not help, particularly in novel situations, as it was in this case. While mindful of this inclination and tendency, he continuously tried to ensure the strategic inputs were captured and analysed correctly before diving into the numbers. For respondent 28, it was essential to understand the business assumption before business numbers could be examined, as the assumptions and the business context were vital in shaping the interpretation of the financial numbers he was analysing. Without business assumptions being understood and interpreted, respondent 28 mentioned he was not in a position to justify and explain his findings to the board as these assumptions were to be made very explicit.

6.7 Summary and Conclusion

Qualitative thematic analysis was used to analyse the data while anticipating unexpected findings emerging when exploring sensemaking and sensegiving practices from cognitive, discursive and material perspectives. The analysis process consisted of transcribing, coding and analysing the data collected through the extended semi-structured narrative of practice interviews and document analysis. The data was analysed flexibly using MXQDA software whilst attempting to interpret the research findings. Multiple readings of transcripts, field notes and document analysis helped attain data familiarisation. Through continuous reading, any emerging themes were compared against the data to uncover similar meanings and patterns from within the data. Data that shared similar meanings were then categorised, eventually identifying broader themes across each data set.

Chapter 7 Discussion

7.1 Introduction

This thesis examines HRAPs' sensemaking and sensegiving work and seeks to explore the following main research question and its two sub-questions:

How are the sensemaking and sensegiving practices required as part of their role put into action by human resources analytics practitioners?

The two sub-questions are:

1. Through which cognitive and discursive activities are these sensemaking and sensegiving practices enacted by human resources analytics practitioners?

2. How are analytics tools, technologies and artefacts engaged to support the cognitive and discursive practices when making and giving sense?

An extensive examination of the interviews with the 30 participants has shown some intriguing results. The analysis helped identify five themes that cut across the HRAPs' sensemaking and sensegiving practices. Figure 6-1 synthesises the analysis of findings outlined in the previous chapter. The discussion begins with a reiteration of the central premise of the study based on SSF (Figure 4-1) developed in Chapter four. While leveraging the empirical findings and existing literature, the chapter below unpacks these five sensemaking and sensegiving practices and provides insights into the revised SSF (Figure 7-1). The researcher leverages the existing literature and builds from the findings in four areas to anchor the contribution to practice and theory in HRA, sensemaking and sensegiving literature.

7.2 Revised Sensemaking and Sensegiving Framework

It was evident from the empirical findings that the SSF presented in chapter four achieved its role in unpacking the sensemaking and sensegiving practices whilst also revealing the underlying activities. The empirical findings confirm that HRAPs create meaning for self and others through a thinking-doing interface that gives them the capacity for reflexivity. The revised SSF framework brings to the forefront how reflexivity serves to reconstruct sensemaking and sensegiving and how HRAPs think and act with the TTAs. The findings confirm that, in practice, the boundaries of sensemaking and sensegiving are permeable but also show how sensemaking and sensegiving practices are invoked to support each other. The revised framework also conceived HRAP’s sensemaking and sensegiving as cognitive-discursive practices supported by TTAs when they assign meaning to data and its relevant cues and simultaneously communicate sense to others. While doing so, the empirical findings unpack how cognitive and discursive practices shape each other. Figure 7-1 offers a visual presentation of this revised SSF framework.

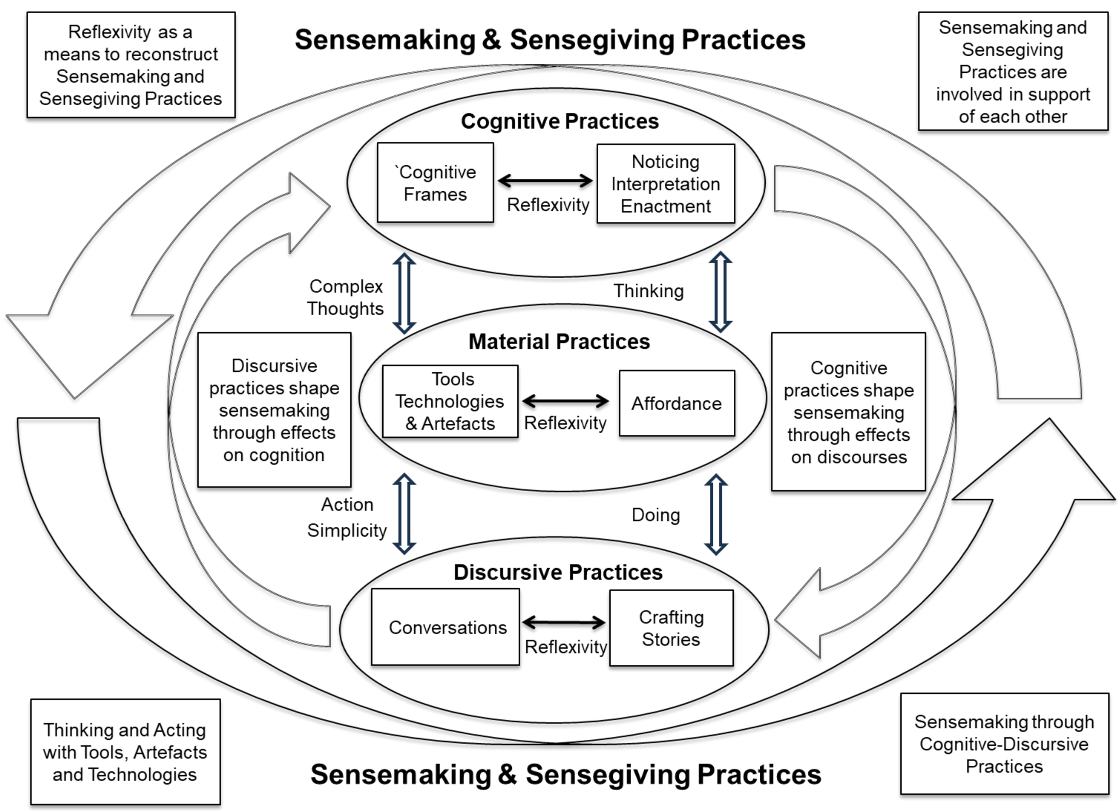


Figure 7-1: Revised Human Resources Analytics Practitioner Sensemaking and Sensegiving Framework

7.2.1 Reflexivity as a Means to Reconstruct Sensemaking and Sensegiving

The study has examined HRAPs' reflexivity as an opportunity to unpack sensemaking and sensegiving features from within experience, extending sensemaking and sensegiving from purely ontological activity to epistemological activity. It argued that HRAPs developed improved understandings of the relevant sensemaking and sensegiving practices and their underpinning activities through reflexivity, both in situ and retrospectively. In other words, reflexivity has been identified as the critical enabling condition in their sensemaking and sensegiving process. Reflexivity helped HRAPs to question their mental representations of past frames for their application and relevance when the sensemaking action is carried out. In other words, reflexivity questions the quality of HRAP awareness regarding their mental frames, which brings to the surface the fact that their relationship within the practice world needs to be questioned (Holt and Cornelissen 2014) and enables HRAPs to release the powerful grip of past frames which sometimes are heavily entrenched.

The thesis argues for relaxing the conceptual boundaries of thought and allowing complication/s to surface as part of analytical practice (Clegg et al. 2005). It highlights the need for vigilance in critically revising modes of sensemaking and sensegiving when executing complex tasks such as data analytics. The research views HRAPs' practices as situated, embedded and boundedly intentional in which they are open to learning to think differently through reflexive questioning, paradoxical framing and relaxing the frame boundaries.

7.2.1.1 Reflexive Questioning

The findings identified that reflexive questioning helped HRAPs to self-critique and modify their frames to the situational demands by examining the profound implications (Cunliffe and Easterby-Smith 2004). Although HRAPs' past assumptions facilitated the interpretation and articulation of their current understandings of an issue in most situations, reflexive questions further helped them delve deeper into the issues, as suggested by Lüscher and Lewis (2008). Such questions pushed HRAPs to examine the consequences of their understanding of problems and stakeholders, as findings suggested that they questioned their own and others' experiences and assumptions and their very way of formulating them in varying contexts. While doing so, HRAPs' reflexive questioning practices spurred double-loop learning (Cunliffe and Easterby-Smith 2004).

This sensemaking through reflexive questioning helped HRAPs to define more specific problems/situations/events and eventually set boundaries to enable subsequent reflexivity. In addition to self-reflexive questioning, this reflexive questioning also included encouraging stakeholders to thoroughly explain the issue, which helped highlight their current challenges and expectations. For instance, examples of reflexive questions are: Why is this concern for you? What is causing this? How would you like to resolve this? These practices of reflexive questioning challenge simplistic solutions, motivating HRAPs to experiment with alternative frameworks and approaches continuously. For example, returning to the example of HRAPs checking with their stakeholders by asking, “Is what you are saying realistic?” Such questions explain the HRAPs’ desire for simple answers to these intricate questions regarding their stakeholders' concerns. Nevertheless, by stating the issue, the HRAPs created a foundation for their sensemaking and sensegiving.

Reflexive questioning helped HRAPs recognise when their current understandings oversimplified an issue or where alternative assumptions needed to be factored in while trying to solve the organisation’s problem. These reflexive conversations made HRAPs aware they were missing key elements or ignoring other perspectives and connections. In addition to listening to others, HRAPs also engaged in practices of hearing themselves to question their fundamental assumptions about a problem and its contexts. These self-reflexive practices of questioning the assumptions helped them avoid missing key elements, perspectives and connections. Awareness that their inherent logic/s essential to their frames were insufficient motivated deeper exploration. This redefinition of the problem occurred due to respondent 11 questioning his initial assumption of the project scope after getting new patterns in the data and bouncing some of his initial results to stakeholders. The critical awareness of the emerging data cues led him to question himself on the initially defined assumptions and eventually ended in him revisiting his scope.

Although the findings argue for critical reflexive questioning as an essential practice, it is also pertinent to mention that HRAPs pointed towards some downsides and unintended consequences. In an organisational context, the reflexivity mode of sensemaking is hard to implement, whereby the simplicity part of the simplexity line of thought is favoured (Guiette and Vandenbempt, 2016). HRAPs operate in an environment dominated by institutional logic and constraints, which dictate how practices must occur in an environment with competing interests, resources and time constraints (Thornton, Ocasio, & Lounsbury, 2012). These institutional logics and constraints are aimed to control and reduce complexity. As a result, HRAPs shared a pragmatic approach towards their analytical project, considering organisational practical constraints and limitations through paradoxical framing as discussed below.

7.2.1.2 Paradoxical Framing

In line with earlier studies where working through paradox is central to practitioners' sensemaking (Lüscher and Lewis 2008) and sensegiving (Sparr 2018) during organisational change, the study found that the experience of navigating paradox is central to HRAPs' sensemaking and sensegiving efforts. In hindsight, this is not surprising as the organisation environments are complex with inherent experiences of contradictions, incongruity, and incoherence (Smith and Lewis 2011). In the analytical context, some contradictory yet interrelated demands seem logical when viewed in isolation but may appear irrational and impractical when appearing simultaneously. The very nature of this paradoxical experience prompts sensemaking as HRAPs seek to bring some order and coherence to their experience.

For HRAPs, sensemaking and sensegiving are more than just a process to give meaning to data in a particular context. Findings suggest that, while making and delivering the sense, HRAPs pursue subjectively perceived coherence (Schildt et al. 2020), which often involves navigating interdependent and often contradictory experiences when executing their role. Acknowledging the coexistence of these contradictions enables them to make sense of analytics complexity. The oscillating between the opposing view of dilemmas or contradictions spurs HRAPs' paradoxical mindset. Previous studies have indicated that paradoxical thinking is prompted by recognising a dilemma in which no choice can solve the tension and competing solutions are needed (Lüscher and Lewis 2008; Knight and Paroutis 2017; Sparr 2018).

As part of paradoxical thinking, the thesis argues that reflexive practices allowed HRAPs to consider other perspectives, alter their assumptions, and explore underlying issues differently, which is fundamental to analytics application (Calvard 2016). Indeed, applying a paradoxical mindset via reflexive practices as part of the sensemaking and sensegiving experience helped the HRAPs to better capture the complexity of the organisational issues as part of their role. Furthermore, it is worth mentioning that, for HRAPs navigating with a paradoxical mindset, it does not imply eliminating or resolving paradox but achieving a coherent account via reflexive practices when making and giving sense.

The findings strengthen the earlier research that a paradoxical mindset alone does not offer a solution (Knight and Paroutis 2017). When a paradoxical perspective is reflexively implemented, it often complicates the situation. It may provide HRAPs with means for new and more enabling understandings of contradictory analytical demands and omnipresent challenges in the role. While doing so, the awareness of paradoxes and their interactions with HRAPs’ reflexive sensemaking and sensegiving practices somewhat complicated the very understanding of managing these paradoxes. HRAPs may recognise and try to work through a contradiction, but others’ perceptions may vary. For instance, there were situations where the business did not perceive an HRAP's paradoxical approach as an appropriate practice. For example, respondent 24 was faced with a situation of managing the paradox of having a data-based approach versus an intuition-driven one from the GMs. While doing so, respondent 24 had the formidable challenge of managing the GMs' expectations as they were keen to continue only using their intuition when deciding on the requirement of drivers as, according to them, data was not helping them to predict the drivers' needs.

When a choice between polarities appeared untenable, the HRAPs became wary of the typical either/or mindset and consciously searched for both/and options. This would involve a higher level of abstraction; HRAPs would pursue a link between the opposing elements with a pragmatic approach of reframing conflicting demands as complementary instead of contradictory. One example was when respondent 5 was facing the dilemma that he should focus on the day-to-day operational needs of the business for analytical reporting on human resources planning or on implementing a new HR software as part of the strategic agenda of automation of HR processes. From an organisational standpoint, both requirements were vital to the analytical agenda. He sought to link these two conflicting demands by moving from an "either/or" to a "both/and" thinking. Respondent 6 applied means-end logic using temporal separation to reframe the issue and address the paradox. One of the common links between the two contradictory demands was data mining, which was required in both projects, so he initiated the data cleaning process to serve both projects.

In the context of HRA, Jörden et al. (2021) observed that the set customer demands sometimes pushed HRAPs to compromise the scientific rigour of their work when attempting to meet the requirements of their customers. Alongside this dilemma, the organisational requirements urged HRAPs to concede on their thoughtfulness and exploration of doubts to deliver the project on time. Contrary to the findings of Jörden et al. (2021), this study suggests that HRAPs were mindful of these contradictions where, on the one hand, there was scientific rigour and, on the other hand, stakeholders' requirements were to be met in a timely fashion. The study highlighted that HRAPs took different approaches to organise and align themselves with business needs. However, what is consistent across these approaches is a reflexive mechanism for achieving an in-depth understanding of organisation priorities and the specific needs of individual stakeholders and being mindful of the limitation of time, resources and data.

According to HRAPs, while the timely delivery of the projects was a critical indicator of their success, they were keen to have conversations and feedback loops, enabling expectation management and aligning with organisational needs. This mechanism involved a continuous reflexive conversation with self and others as projects might have failed to deliver high-quality outputs without aligning with business needs. Furthermore, while HRAPs in the study sought to manage the stakeholders' expectations regarding time constraints and resources simultaneously, they were committed to offering scientifically rigorous insights. They strived to meet the data needs of senior managers through analytics alongside pushing the organisational strategic agenda wherever applicable.

In line with previous research on managing paradoxes (Knight and Paroutis 2017), the study argues that paradoxical recognition helped tap the positive potential for tensions to trigger both and/or approaches and ongoing modifications. HRAPs usually do not like compromising accuracy, even if it takes longer to chase accuracy, but the situational demands must be factored in accordingly. On the one hand, HRAPs must act fast and cannot consume time for their leisure to achieve data accuracy. On the other hand, HRAPs have to subject their understandings and the analytical approach to scrutiny, so, eventually, it has to be the best of both, i.e., analytical scrutiny and speed rather than analytical scrutiny or speed. Once both polarities of paradox were accepted, in situations where HRAPs were not confident of the accuracy of the data, they shared that they opted to mention the degree of confidence in the accuracy of the data in their report and continued striving to improve data accuracy. As Poole and van de Ven (1989) proposed, acknowledging paradox proved crucial for HRAPs, enabling a degree of consolation with paradoxes embedded and continued improvement as part of managing the process.

Similarly, consistent with the findings of Greasley and Thomas (2020), the thesis also revealed some of the challenges between HRAPs and senior managers, describing how some leaders wanted hard facts and figures while HRAPs placed equal emphasis on subjective experiences. Contrary to the above, there were situations where managerial gut feel and intuition were preferred over numbers. The findings shed light on when HRAPs face such dilemmas and point towards HRAPs' reflexive conversations with themselves and others to develop persuasive discursive practices to encourage stakeholders to complement their prevailing intuition with numerical insights and vice versa. These reflexive conversations developed into a patterned process viewed as influential in supporting HRAPs to navigate these paradoxes.

7.2.1.3 Relaxing Frames Boundaries

Predominately, the research labels sensemaking as retrospective, achieved through mental representation in the form of frames cultivated in the past (Weick 1995; Weick et al. 2005). Most published work shows that sensemaking is built on historical foresight irrespective of the focus (past, present or future); organisation actors get to grip the future by learning from the past. The thesis offers HRAPs' pursuit of coherence as evidence of temporal connection that has thus far been underrepresented when understanding sensemaking patterns (Sandberg and Tsoukas 2015). The HRAPs' experience of pursuit of coherence brings a temporal dimension of sensemaking to the forefront wherein, as HRAPs attempt to carry the past into the future, they pull the emergent future into the present as it unfolds (Guiette and Vandenbempt 2016). The research findings provide a perspective on HRAPs' sensemaking that focuses on living in the present, making sense of the experiences on the go and being open to potential emerging futures (Guiette and Vandenbempt 2016).

The findings echo Weick (1995) and Weick et al. (2005) seminal work: sensemaking is achieved when HRAPs create a plausible narrative linking the past, present and future through mental frames. The study suggests that an analyst's pursuit of coherence connects forward-looking temporality with present temporality. For example, from a forward perspective, the problem-framing practice is about understanding how things will unfold (Sandberg and Tsoukas 2015). At the same time, drawing on the context is embedded in a prevalent present temporality (Guiette and Vandenbempt 2016). The findings suggest that HRAPs' while holding their pre-existing frames at the back of their minds, attempted to build bridges between the problem and the expected outcome of their analytics task. While doing so, they had to venture out of their existing frames through reflexive conversations with themselves and others.

Furthermore, the thesis observed that sensemaking in data analytics involved situations wherein emerging frames from noticed cues and interpretative frames based on past sensemaking may co-occur and compete for attention (Colville et al. 2013). HRAPs were repeatedly confronted with tasks and situations that formed a clear break from their past experiences. For example, HRAPs pointed towards a situation where there was a conflict over whether to use more familiar analytical models in emerging situations or collect more cues through sophisticated data mining and visualisation techniques and then decide on the appropriate analytical models or tools (George et al. 2014). In some situations, the pre-established and narrow frames inspired by past sensemaking may fall short of sensing, interpreting and enacting any manifestation of novelty in data analytics (Bosma et al. 2016).

More specifically, the thesis argues how sensemaking can occur if emerging situations and cues are not noticed and picked up, to begin with, through frames from the past (Guiette and Vandenbempt 2016). The challenges mentioned above have fuelled criticism of sensemaking for over-reliance on retrospective and instrumental views on sense, i.e. all present and future events can be made sensible based on the past frames (Holt and Cornelissen 2014; Maitlis and Christianson

2014; Sandberg and Tsoukas 2015). HRAPs' reflexive awareness of this default tendency and bias for concepts based on past frames to overshadow the percept in the present was critical for sensemaking (Colville et al. 2016).

The findings alluded to the value of dissociating present interpretations from the past frames in novel situations. The study suggests that HRAPs' sensemaking at times attempted to balance retrospective and prospective sensemaking to help manage novel and complex problems instead of relying only on retrospection based on past frames (Hernes 2014). Especially when HRAPs faced high complexity and ambiguity in a novel situation, the temporal dimension of sensemaking became pivotal, given that, at times, the past may not accurately predict emerging futures.

HRAPs made sense of the future in novel situations as they emerged through this release of the past frames. While preparing their organisation for future possibilities in novel situations, the HRAPs balance the retrospection and the novelty experienced in the present, acknowledging that the past and the future are experienced in the present, and the present shapes the past and future (Hernes 2014). As in respondent 28's case, the taken-for-granted beliefs were irrelevant to interpreting the present experience and possible future due to the COVID-19 pandemic (Sandberg and Tsoukas 2015). Respondent 28 reflexive awareness allowed him to approach the situation as it emerged rather than fixing his mind to some preconceived notions and ideas based only on experience.

While the past frames enabled HRAPs to manage familiar situations that they experienced, in the event of novel or complex situations, these past frames tend to fall short of guiding HRAPs' interpretation. The complexity of the novel or unfamiliar situations demands the HRAP to be reflexive and mindful of the unimaginable future. Consequently, HRAPs' ability to know when their past frames will not be able to serve them holds the key as the inevitable emergence of the unforeseeable or unexpected reminds HRAPs that all their past sensemaking experiences and existing knowledge may be incomplete. The thesis argues that the HRAPs' reflexive awareness helped them to appreciate that these past frames fell short of guiding them.

The findings support the argument that sensemaking is about revealing the unknown possibility in certain situations rather than retrospective assessment (Holt and Cornelissen 2014). The HRAPs reflexivity helped them to learn to make sense of the future or the novelty through this release of the past frames (Bosma et al. 2016). When faced with a radically open future, HRAPs' prospective sensemaking requires them to use the past imaginatively to allow unknown perspectives and insights to emerge into sensemaking (Clegg et al. 2005). The empirical evidence reveals the ability of HRAPs to expect the unexpected and reflexively question and relax their frames based on past sensemaking for validity in the present (Guiette and Vandenbempt 2016).

This reflexive awareness helps HRAPs learn and make sense of the future by liberating the self from the past and allowing them to grasp what is going on, regardless of the interpretive mechanism necessitated by preconceived ideas. The mindful and more balanced framing of sensemaking is rooted in a predominant present temporality that surpasses the cognitive and linguistic sphere (Guiette and Vandenbempt 2016). As such, HRAPs learn to deal with the equivocal mess, particularly when their context changes, as the contextual application of the past frames requires reflexive thinking. In practice, this means balancing living in the present and experiencing the past and future in the present (Hernes 2014).

The research advances the notion that an HRAP’s reflection and reflexivity during sensemaking at the nexus of continuous sensemaking connects living forward (prospective sensemaking), understanding backwards (retrospective sensemaking) and living in the present moment, respectively (Guiette and Vandenbempt 2016). The space between living forward and reflecting in the present moment offers a trigger point for analyst reflection and reflexivity by exploring the possibility of connecting frames as past conceptualisation with present moment cues and pulling the emerging future potentialities within data and the business context (Hernes 2014). The reflection and reflexivity modes define the HRAP's responsiveness to the experience on the go (Cunliffe and Easterby-Smith 2004; Chia and Holt 2006; Introna 2019), which determines how sense or meaning is enacted in between the continuous sensemaking (Guiette and Vandenbempt 2016). At the same time, it is worth mentioning here that HRAPs look for information, but they see what they expect to see and may overlook unexpected cues. HRAPs' frame memories may not fully support understanding the current business context they are confronting. Even when HRAPs do not find the conclusive story in data, some sense still needs to be constructed, and learn how to cope with it through not knowing reflexive attitude (Guiette and Vandenbempt 2016).

7.2.2 Sensemaking and Sensegiving Practices are Invoked in Support of Each Other

The research agrees with the notion that complex sensemaking environments create the opportunity for sensemaking and sensegiving (Maitlis and Lawrence 2007), as HRAPs sought to construct sensemaking accounts for themselves and then craft sensegiving accounts that could make sense of data insights for stakeholder groups with divergent interests. Previous studies have focused on organisational change (Gioia and Chittipeddi 1991; Rouleau 2005; Hope 2010; Sharma and Good 2013), post-merger integration (Monin et al. 2013), jazz leadership (Humphreys et al. 2012), innovative and entrepreneurial activities (Hill and Levenhagen 1995), and newcomers' executive sensemaking and sensegiving (Smerek 2011) as the context for sensemaking and sensegiving. The thesis extends the scope of sensemaking and sensegiving application to the analytics context, and, in doing so, it advances the understanding of HRAPs sensemaking and sensegiving.

The findings point towards the relationship between sensemaking and sensegiving, focusing on how sensemaking affects sensegiving and vice versa. Sensegiving has been recognised in the literature as an attempt to influence others' sensemaking

(Maitlis and Lawrence 2007; Cornelissen et al. 2012; Monin et al. 2013), but the findings showed that this is not always the case. Instead, based on their goal orientation, HRAPs, through sensegiving, successfully worked out the meaning of an event, piece of data or action without attempting to shift the definition of reality for others (Weick 1995). In practice, HRAPs' sensegiving also seemed to affect their sensemaking around an issue (Weick 1995), as the conversational practices such as framing stakeholders' needs and expectations, building and mobilising a support network, crafting and delivering conversations through storytelling and demonstrating credibility in which HRAPs were engaged to give sense also supported their meaning-making process in pursuit of giving sense to all concerned. Hence, the thesis argues that HRAPs deployed predictable sensegiving practices through anticipatory sensemaking practices, creating an opportunity wherein sensemaking and sensegiving are put into action in support of each other.

7.2.2.1 Sensegiving through Anticipatory Sensemaking Practices

The study shows that sensegiving is an anticipatory process in which HRAPs were not sure their sensegiving efforts would achieve the desired results. This anticipatory thinking may take the form of prospective sensemaking for the events that may occur soon when formulating expectancies (Weick et al. 2005). For example, HRAPs' anticipatory thinking was about recognising and preparing for complex challenges, which may not be clearly understood until they encounter them. HRAPs anticipated the sensegiving challenges they might face and worked on various enabling discursive strategies to align their communicative agenda to the stakeholders' needs and expectations. In this regard, the enabling discursive practices of framing stakeholders' needs and expectations and building and mobilising the support network inform the HRAPs' sensegiving approach through anticipatory sensemaking. These sensemaking and sensegiving practices aimed to create meaningful opportunities through constructive conversations that attempted to reconcile divergent needs, demands and interests from various stakeholders and then prioritise them.

In addition to the first two enablers, the third enabler was the HRAPs' credibility as perceived by others, aided by their official position, analytical-related competence and discursive practices. The findings from this study suggest that HRAP's analytical competence is driven by functional knowledge of HR and business and the analytical domain technical expertise. This analytical competence needs to be fused with conversational practices and actions, demonstrating credibility through consciously coordinated activities that make HRAPs relate to others and create the perception in stakeholders' minds of being “one of us”.

The justification and need for building credibility suggest HRAPs' anticipatory thinking while appreciating that their ability to operate effectively rests on their perceived credibility. HRAPs built and demonstrated their credibility through discursive acts of relating to others better to appreciate the stakeholders' position, expectations and context. Thanks to these practices (framing stakeholders' needs and expectations, developing and mobilising the support network, and establishing credibility), HRAPs could articulate sensemaking and sensegiving accounts of the problem. Through these practices, HRAPs perceived and anticipated sensemaking gaps (Maitlis and Lawrence 2007) as part of their sensemaking, which informed their sensegiving strategy and approach. These practices helped HRAPs shape the rationales behind their data stories (sensegiving) while considering the stakeholders' needs and expectations acquired through sensemaking.

Furthermore, HRAPs' sensegiving actions were not only aimed at affecting the stakeholders' attention and understanding of the issue (Dutton and Ashford 1993) but also helped the HRAPs make sense of their own experience. In other words, HRAP’s sensegiving practices directed towards stakeholders are not simply enacted to provide stakeholders with sense but also to create meaning for self as part of sensemaking. For example, as part of conceptualising and formulating the problem through problem-framing, cognitive and conversational practices such as framing the hypothesis, defining the scope and sometimes refining the initial scoping are sensemaking practices to help HRAPs explicate their current frames.

However, at the same time, the findings suggest that these conversational practices of asking the right questions are a form of sensegiving intended to make sense, reflected in HRAPs' approach to problem framing. These conversational practices have helped HRAPs define and refine their conceptual frame of reference more precisely to ascertain how they need to support the stakeholders in their operational decision-making. In addition to giving sense, these conversation practices included questions such as: Why is this piece of data necessary to you? What kind of decision are you making through this piece of data? What are the concerns about the data being fed to business leaders? In this way, conversational practices were put into practice while making and giving sense by HRAPs.

HRAPs faced situations when business managers understood their strategic goals but were unclear about how data-driven analytics can help achieve them through informed decision-making. In these situations, findings suggest that HRAPs were mindful of not getting stuck in their local view, deep in the algorithms and statistics and instead of relying on speaking the business language their stakeholders can easily comprehend. Thus, to execute the translation dimension of their role, HRAPs deployed sensemaking and sensegiving practices through understanding stakeholders' needs and expectations, mobilising the support network and demonstrating credibility as a cumulative dimension to describe the general condition enabling sensemaking and sensegiving in support of each other.

The thesis further revealed that the nature of the role also played its part in setting the context for sensemaking and sensegiving getting invoked in support of each other. The role partners directly with individual businesses on their specific business issues and problems, which requires a translation capability to bridge the gap between business leaders and the technical function of analytics. HRAPs convert strategic business challenges into analytic questions and then employ evidence-based practice to interpret insights from the analytics, involve stakeholders and drive desired business improvements.

7.2.2.2 Contextualised Inferences and Possibilities Shaping Sensemaking and Sensegiving

This study highlights the role of HRAPs' contextualised inferences and possibilities in shaping their sensemaking and sensegiving practices. While doing so, the study elaborates on HRAPs' 'skill' or 'craft' that lies in their ability to draw on the context and construct and shape the meaning through data. The HRAPs shared their experience of using knowledge of their organisational context, priorities and stakeholders to make and give sense within the context of operation through cognitive-discursive practices. The study emphasises the importance of drawing on business context to enable HRAPs to translate strategic challenges into analytic questions and provide stakeholders insights. While doing so, the study demonstrated how HRAPs deployed practices and underlying activities to leverage the output from their practice of drawing on the context to support their HR analytics agenda. By studying HRAPs in broader contexts, the research confirms sensemaking and sensegiving as political and contextually embedded processes (Dutton et al. 2001; Rouleau and Balogun 2011) and significantly advances the application of contextual dimension/s.

The study expands on prior research that contends managers must possess political acumen to enact sensemaking (Mangham and Pye 1991; Balogun and Johnson 2005; Buchanan 2008). Research extends the findings of earlier studies, bringing contextual understanding to the forefront when making sense (Maitlis 2005; Sonenshein 2006; Rouleau and Balogun 2011). For example, Rouleau and Balogun (2011), while exploring middle managers' discursive competence, highlight sociocultural contextual practices. While expanding the scope of these sociocultural contextual practices, the research shows how specific practices such as mapping the strategic priorities, scenario mapping for external context, contextualising through metrics and value chain mapping are put into action to seek an understanding and knowledge of the business priorities embedded in the specifics of the context. These practices suggest that HRAPs locate their actions within their context of operation. HRAPs' understanding of the business context provides clear focus and reduces vagueness regarding which aspects they should look for while making sense. Their analytical exercise's objective/s and business relevance allowed HRAPs to deploy structured search routines to collect data and other relevant cues (Das and Teng 1999).

While staying consistent with the argument of analytics as a boundary-spanning function (Cayrat and Boxall 2022), the research highlights the importance of HRAPs' ability to remain relevant to the context by unpacking the nature of the knowledge they draw on and mobilise to make their findings relevant and gain the trust of the stakeholders. The role requirement of the boundary-spanning function expects HRAPs to work closely with other functions in support of their analytical agenda. In doing so, the HRAPs mentioned using analytics to support stakeholders in making fact-based decisions and enacting change rather than simply producing HRA in the hope stakeholders will make the necessary connections to significant outcomes, underlying causes and effective actions.

Thus, one of the critical requirements for HRAPs is to discern which data and analytics are likely to be most pivotal to the vital issues facing the organisation. That is why findings suggest that HRAPs need to be adept at analysing business strategy and understanding how human capital connects to those strategic issues. This ability to connect to pivotal business issues has also been referred to as having business acumen in today's competency models (McCartney et al. 2021). The study has suggested that the practices of contextualised inferences and possibilities go well beyond having business acumen and refer to the sensemaking ability to understand the logic of the business well enough to not only identify the right priorities for the analytics but also bring back findings to the context and see where and how data can improve pivotal decisions impacting the business results. Contextual awareness helps create the connective tissue between the strategic and operational aspects of the business with the various elements of the talent life cycle.

From a sensegiving perspective, existing research describes various situated sensegiving practices and the need for organisation actors' contextual understanding to perform them in a skilled way (Gioia and Chittipeddi 1991; Gioia et al. 1994; Maitlis 2005; Pye 2005; Maitlis and Lawrence 2007). While doing so, the extant research does not unpack details of the contextual understanding as this research does to show that the craft of sensegiving lies in the knowledge of the context (including tools and resources) and exploiting it to one's advantage.

The research builds on earlier research emphasising the importance of contextual knowledge, such as strategic, relational and normative contextual knowledge (Dutton et al., 2001) and sociocultural systems (Rouleau and Balogun 2011), essential to influencing activity. The thesis expands the scope of relational knowledge and argues for additional sociocultural dimensions that need to be considered, such as awareness of stakeholders' data literacy level. In addition to awareness of data literacy levels, activities such as building the data literacy of stakeholders such as HRBPs indicated how HRAPs were keen to further their agenda. Within their organisational context, HRAPs' awareness of who can be their change agent proved critical in driving change as part of their sensegiving.

The findings related to the importance of context also illustrated the sensegiving process's complexity in analytics. The research shows that contextual awareness plays a significant role in understanding the political and discursive dimensions of sensegiving. The alliance and support required to propel sensegiving are referred to as critical enablers by HRAPs. For example, to activate some alliance and support, analysts need to act politically and be socialised within their context of action to create and shape the opportunities for sensemaking and sensegiving. The research shows how conversations are adjusted through practical knowledge of the sociocultural context (for example, their interests, management style, business challenges, personal stories and business context). As a result, the range of practices includes activities focused on the future, such as establishing networks, coalitions and relationships in advance of usage and personal credibility to be seen as a reliable partner for the future.

Drawing on multiway sensemaking as Maitlis (2005) and Rouleau and Balogun (2011) did, this research reveals how HRAPs build settings to have multiway sensegiving, i.e., upward, downward and lateral. It confirms that activities involved in sensegiving take different forms and are adjusted according to the stakeholder group to which they are to be communicated. This drawing on the context helps HRAPs understand and communicate connections between their analyses and the business and enhances the credibility of results. These practices also reflect the practical and political tensions associated with sensegiving in a given context, so HRAPs must engage in contextually sensitive practices as they can either hamper or facilitate sensegiving.

7.2.3 Sensemaking through Cognitive-Discursive Practices

Based on empirical findings and analysis through revised SSF, the study argues for a cognitive-discursive mode of sensemaking during data analytics duly supported by the TTAs. This broader conceptualisation of the sensemaking process considers different ways of engaging with the range of relevant sensemaking cues and the data that affect HRAPs'. Depending on the circumstances, HRAPs may give differential attention to the information from different modes/sources, i.e. cognition and discursive. The revised SSF argues that an integrative deployment of distinct sensemaking resources is beneficial across issues, contexts, and audiences, and it is likely to be particularly useful in the data analytics context. In this way, HRAPs may begin to make sense starting from either or both types of resources in an integrative manner in a given situation.

Pursuing coherence and setting up and delivering conversations across varying contexts opens up research to focus on the content of sensemaking and when and how HRAPs invoke cognitive and discursive strategies (Sandberg and Tsoukas 2020). The findings suggest that HRAPs' sensemaking activities are socially constructed through a range of cognitive and discursive practices while drawing on HRAPs' personal experiences and stakeholders' expectations. It is evident that the perspective on sensemaking underlying the findings remains cognitive-discursive to construct sense (Sandberg and Tsoukas 2020; Weick 2022). The research points towards the opportunities HRAPs created to shape their own and others' interpretations of reality, often lacking direct control of the organisational processes associated with an issue. As coherence is a continuous and partially subjective attribute, even when HRAPs do not find their explanations and understanding entirely satisfactory, they settle on accounts that offer them sufficient plausibility. While pursuing coherence, the research highlights HRAPs' ability to help the sensemaking process conclude. To do this, they must have the ability to understand what makes their sensemaking plausible (Rouleau and Balogun 2011) but also deploy suitable cognitive-discursive means to achieve coherence.

The research extends previous work on sensemaking by broadening the understanding of when, why and how HRAPs call upon sensemaking to refine their plausible accounts. Past research suggests that cycles of sensemaking conclude when there is perceived consistency between the interpretation contained in the account through cognitive practices (Lüscher and Lewis 2008), discursive practices (Rouleau and Balogun 2011) and episteme as a system of linguistic coding (O'Leary and Chia 2007). The research widens the focus from the traditional focus of individuals creating accounts, either cognitively or discursively, and accepting or rejecting them and suggests that, in practice, sensemaking is an iterative process in which HRAPs try to refine their plausible accounts through a range of sensemaking involving cognitive and discursive activities. The thesis argues that thinking reflexively about the people and the situations in which HRAPs found themselves led them to produce more meaningful cognitive-discursive practices appropriate for the situation and responsive to others' needs, values and expectations. Specifically, as depicted in Figure 7-1, the study highlights the recursive relationship between cognitive and discursive practices through (a) conversations and discursive practices used to shape cognition by building/rebuilding frames and (b) cognitive frames shaping conversations and discourses. By doing so, the research offers an understanding that these practices are interlinked and underpin each other.

7.2.3.1 Discursive Practices Shaping Cognition

Discursive practices enable or constrain social interaction, which, in turn, influence cognition to make sense. The research empirically demonstrates HRAPs creating and shaping the opportunities for sensemaking through a series of discursive practices. These discursive practices were not embodied through some abstract/cognitive understanding or practice; instead, they were connected with and embedded in situations and contexts relevant to stakeholders' needs and expectations as worked upon by HRAPs. The research points towards how these discursive practices are put into action to support each other in seeking cognitive coherence. The research shows how HRAPs have achieved cognitive coherence by gathering more cues, optimising those cues, assessing the quality of the inconsistent data, disregarding the conflicting data and cues, and making and validating those assumptions.

The research brings HRAPs' discursive abilities to the forefront to understand their stakeholders’ diversity, needs, roles, communication styles and data savviness. These abilities are demonstrated through situated social practices involving more than structuring and delivering conversations and stories. As part of setting up, HRAPs were involved in intensive stakeholder analysis to determine the most effective way of conversing to fit the purpose. Activities include trying and understanding who they are and their priorities, as business decision-makers are very busy with many priorities competing for their attention. HRAPs strive to facilitate the stakeholders to make fact-based decisions, as this has improved the likelihood of the success of their choices.

When mapped to audience attributes, the discursive means assisted the HRAPs in elucidating their ideas, enhancing the quality of their decisions, and motivating them to take the desired action. For example, before presenting their findings to their stakeholders, HRAPs performed intensive stakeholder analysis to understand the perceptions and personalities of each stakeholder. On a similar pattern, HRAPs also mapped stakeholders' personalities from a risk-averse or adventure-seeking perspective and aligned their conversations accordingly to recognise each personality type. In order to support their sensegiving efforts, HRAPs identified the data-savvy managers from their stakeholders who could help them drive the analytical agenda forward by capitalising on the ability to influence others.

The study supports the idea that sensegiving is a skilful action rather than an item to be passed along (Sandberg and Tsoukas 2015). The power effect, whereby some stories and conversations have more impact than others, partly comes from the HRAP's ability to create and shape opportunities within the context through cognitive-discursive practices. In other words, it is not just cognitive-discursive means but the utilisation of these cognitive-discursive means in particular settings and the knowledge of stakeholder interests, preferences and capabilities in creating and shaping the opportunities for sensemaking and sensegiving that allowed HRAPs to persuade others towards specific goal/s.

Similarly, the way HRAPs crafted and delivered conversation and stories cannot be understood without considering how they enacted discursive practices as they interacted with others. In order to mobilise people for their cause, HRAPs position themselves in such a way that they are aware of the diverse power, status and circumstances of others. The research shows how cognitive-discursive means are intertwined with the building of settings; sensegiving through storytelling is practically entrenched in a series of cognitive-discursive acts that convert the confusion into locally situated meanings over time. More explicitly, this research connects discursive and cognitive practices to act politically within their action context.

7.2.3.2 Cognitive Practices Shaping Discursive Practices

The cognitive practices of organising stories through data, such as analytical stories, form the basis of conversation and discourses as systems of thought. Analytical stories provided HRAPs with a sensemaking vehicle for enacting their cognitive-discursive practices to pursue their analytical aims and objectives. Various stakeholders with varying degrees of influence were involved with HRAPs, which they were required to influence regularly to facilitate decision-making by providing data insights. This requires that HRAPs actively engage in steering the stakeholders' sensemaking in such a way that they can comprehend the insights and take necessary actions. Such enabling as a form of sensegiving was achieved through storytelling and conversations, facilitating stakeholders to extract meaning and sometimes to create a cognitive modification (Foldy et al. 2008) for others and self, which becomes the springboard for subsequent actions. Across the various contexts in studies, the research found specific cognitive and discursive functions of data stories where HRAPs attempted to convey their findings persuasively in a simplified manner to lead stakeholders to specific recommended actions.

As part of sensegiving, HRAPs were often faced with the challenge of compressing complex analytical results into a simple and easy-to-relate narrative, allowing them to address any uncertainty stemming from their analytical results. The depiction through data stories helped HRAPs to filter their experience and outcome of their analytical exercise by addressing the high levels of uncertainty and complexity emerging from data surrounding the analytics findings. These data stories helped frame bigger, somewhat abstract, complex relationships, cause and effect and compressed them into an everyday human scale and comprehension. This management of large and complex data down to human-scale imagining and understanding is a process that significantly facilitates HRAPs' ability to relate and draw inferences for themselves and others (Knaflic 2015; Boldosova and Luoto 2019; Dykes 2020).

HRAPs used sensegiving through storytelling to craft and diffuse their integrative frames by engaging the stakeholders in implementing the outcome of the findings where applicable (Hardy and Maguire 2008). HRAPs infused legitimacy into logic through deliberate rhetorical strategies as part of analytical stories, first conceived and then provided language and comprehension that stakeholders can use to interpret the findings. For example, HRAPs facilitated stakeholders' appreciation of the data-driven approach through their cognitive-discursive practices. This is echoed in HRAPs' accounts, where they provided interpretations and engaged in strategic conversations to understand, mobilise and motivate others to create the need and justification for a data-driven approach in decision-making. In this regard, analytical stories also facilitated the construction of persuasive accounts inspiring desired actions to bridge the gap between insights and action.

These analytical stories also provided HRAPs with legitimacy for acting as change agents. For example, respondents 11 and 24 crafted their stories in a challenging situation where they felt a need as part of a persuasion act to encourage the managers to embrace data-based decision-making. They objectified their findings and business relevance to these managers. In this way, they could aim to acquire acceptance and legitimacy for their findings by bringing clarity to a call to action. Therefore, analytical storytelling is a sensegiving device HRAPs use to convey data-driven insights and recommendations/suggestions to the stakeholders through compelling stories that keep the audience interested, engaged, and likely to retain and act on the recommendations given.

HRAPs found stories helpful in communicating technical details regarding data analytics by taking audiences to the source of data, as otherwise, it is not easy to convey the meaning of data to non-technical users. Analytical storytelling is about creating compelling stories where analytical insights are organised (cognitive function) as a guiding pathway by reducing the ambiguity and uncertainty caused by the data and making it easier to comprehend the data’s practical inferences (Knaflic 2015; Dykes 2020). Analysts articulated and depicted simple facts and figures, creating or effectuating outcomes for various scenarios. Similarly, respondent 12 demonstrated his flight-scheduling model by explaining why the insight offered through predicting the flight crew requirement pattern matters to the scheduling staff. He then framed the potential benefit of the forecasting model to staff and how it can contribute towards their key performance metrics without going into the technical details of the forecasting model.

Furthermore, the research suggests that, potentially, the analytical stories in the HR analytical context can help achieve comprehension and acceptability in the wake of the subjectivity element and lack of evidence-based decision-making in human resources, which has been cited as one of the challenges HR practitioners face (Greasley and Thomas 2020). The findings observed that, in some instances, the stakeholders appeared unsure about the HR data predictability and the findings because of the historical reliance on managerial intuition and gut feeling when making HR decisions. With a known precedent and preference for intuition-based decision-making instead of data-based, HRAPs anticipated that insights and findings might not gain the necessary acceptance and legitimacy for implementation.

Through cognitive-discursive means, HRAPs shaped and created opportunities to draw strong parallels with their contexts through success stories, which helped them acquire acceptance and legitimacy. HRAPs connected the benefits and outcomes of data insights through storytelling to the goals and objectives, e.g., profitability targets of the targeted audience. In this way, HRAPs could help sceptical stakeholders break from their preferred mode of intuition-based decision-making and open their minds towards data insights to address their present concerns and challenges. For example, respondent 11 demonstrated flexibility and control for the managers who were sceptical about the various combinations and their efficacy when selecting the right profile combination for relationship managers. In doing so, respondent 11 conveyed his findings through a success story that managers are still in control of the situation and can carry it through to success by picking the right combinations and considering each profile's strengths and limitations.

7.2.4 Thinking and Acting with Tools, Technologies and Artefacts

The thesis argues for the central role of human agency in materialising different aspects of TTAs. In this regard, the research points towards analysts' reflexivity as their capability to contemplate themselves concerning their social context(s) in which they function, which includes the material properties of TTAs they use, and to reflect how these can be put into practice. The material resources/technologies, for their part, act as a mediational means for producing and disseminating meanings while pursuing analytical goals. Studies have recognised the significance of examining how humans and materials interact to comprehend better how sensemaking and sensegiving relate to sociomaterial achievements (Stigliani and Ravasi 2012; Jarzabkowski et al. 2013; Hultin and Mähring 2017; Lehrer et al. 2018; Hultin and Introna 2019). The study extends the application of materiality in the analytics context and offers to increase understanding from the human-centric perspective of how different patterns of interaction and the use of TTAs enable the conditions for cognitive and discursive practices.

In line with previous studies, the thesis argued that HRAPs' sensemaking and sensegiving capabilities were amplified through TTAs (Stigliani and Ravasi 2012; Comi and Whyte 2018). The present study contributes to this body of literature by showing that HRAPs in varying contexts enact material practices through the active control and design of TTAs such that they prompt activities that contribute to the realisation of analytical goals. The thesis offers a pattern of an underlying generative mechanism, which could provide several insights into the literature on sensemaking and sensegiving generally and, more specifically, concerning analytics practice.

From a material perspective, the thesis shows how HRAP reflexivity is twofold: First, self-reflexivity by looking inward (Cunliffe and Jun 2005), whereby the HRAPs make distinctions in their practices and challenge their interactions in relation to TTAs.

While the extant literature has acknowledged the critical role of reflexivity when using TTAs (Keevers and Treleaven 2011). Even where reflexivity as a notion or phenomenon is not explicitly explored in material practices, it is often an implied assumption (see, for example, Stigliani and Ravasi (2012). The thesis extends the notion of reflexivity when using TTAs and argues that the enactment of material practices depends on HRAPs' ability and capacity to engage in reflexive, ongoing and situational practices. Second is critical reflexivity (Cunliffe and Jun 2005) by looking outward at the TTAs affordance and how it facilitates sensemaking and sensegiving.

The thesis has demonstrated the activities underpinning material practices and how they are reflexively put into practice to support each other. It has brought the role of HRAPs' affordance in amplifying the cognitive and discursive spread in making and giving sense. HRAPs perceived affordance as an integral part of their reflexive process with continuous opportunities for ongoing thinking and acting. HRAPs used TTAs for many reasons, in many ways, and to achieve multiple outcomes to support their analytical tasks. By analysing HRAPs' affordance practices, the research argues that various TTAs enable them to perform their tasks. Both these notions of reflexivity and affordance are discussed in detail below:

7.2.4.1 The Reflexive Materialisation of Cognitive and Discursive Practices

The material practices in this thesis illuminate some of the practices of HRAPs' organised reflexivity and mindfulness. This reflexivity encourages analysts to consider putting into action the right TTAs in their situated sensemaking and sensegiving while being responsive and mindful amid action and anticipating subsequent actions. The research foregrounds material practice's emergent and reflexive character, amplifying the analysts' cognitive and discursive practices. The outcome of tasks carried out by HRAPs using different arrangements of TTAs is mediated by their reflexive ability to understand the impact of their actions on the tools and others. The findings dovetail with Keevers and Treleaven (2011) diffracting practices and suggest that HRAPs' reflexive practices direct and facilitate analysts in evaluating their interaction and outcome when working with TTAs. The thesis emphasizes the idea of reflexive material practices as a direct material engagement within the practice rather than looking back with some distance as a representational view of reflection (Cunliffe and Easterby-Smith 2004).

The findings demonstrated how effective utilisation of TTAs through their affordances can help discipline specific command structures but can also help control a whole chain of actions when analysts seek plausibility and coherence in their interpretations and conversations through material practices. The data analysis of this thesis demonstrates that material reflexive practices are a pack of entwined collaborative, creative and situational practices that focus on the perceived affordance of TTAs in empowering or constraining HRAPs' sensemaking and sensegiving such as setting up TTAs, representation and engaging stakeholders through appropriate visualisation. These reflexive practices are thereby integral to the sensemaking and sensegiving that supports HRAPs' ability to make decisions and be mindful and responsive in the midst of unfolding material practices.

Recent studies have expanded the idea of interactive engagement in sensemaking and sensegiving to include materials and artefacts like strategic work tools and various information technologies (Stigliani and Ravasi 2012; Hultin and Mähring 2017; Comi and Whyte 2018). The study supports these earlier studies and emphasises the collaboration of the human and material elements in dynamic exchanges or interactions through which they become conditioned to act and interact in specific ways in the sensemaking and sensegiving process. A human-centric viewpoint leads the thesis to assume and reproduce an understanding in which the human is considered the primary sensemaking and sensegiving agent in light of its capacity to evaluate and select stimuli and make various interpretations of the interaction with the TTAs, keeping in view task demands. (Holt & Cornelissen, 2013).

The show-and-tell approach in the second phase of the intervieews in the study enlightened the relationship between materiality and cognition qualitatively when making and giving sense. Sensemaking theory advocates that meaning is created as the abstract (a pre-existing frame) is linked to a material stimulus (a cue), which has been referred to as “labelling” (Weick 1995: 110). The thesis argues that the interaction (interactive) and subsequent manipulation of the TTAs supported the production and dissemination of meaning by enabling the connection between cognitive frames and concrete experiences and then again from substantial experience to frames. Indeed, previous research has shown how this interactive characteristic of tools and software prompts organisational actors to constitute and shape their sensemaking (Parson and Sedig 2014; Kirk 2019).

Current understandings of discursive sensegiving emphasise the multiple sensegiving acts on which the sensegiving process rests and the actors' ability to produce convincing accounts (Maitlis and Lawrence 2007; Rouleau and Balogun 2011). Consistent with this view, TTAs are generally considered nonverbal symbolic resources (Balogun and Johnson 2005; Rouleau 2005; Kaplan 2011) that individuals use to influence others' interpretations. The HRAP account and follow-up conversations extend this notion by showing how TTAs support not only practices of sensegiving but also first support the sensemaking of the sensegiver. By doing so, the study develops the understanding of how distributed individual actions at sensegiving first result in own sensemaking. The study offers insights into how engaging with TTAs in support of cognitive-discursive practices impacts the sensemaking and sensegiving process quality.

All HRAPs shared the common practice that presenting a credible and plausible story to their client involves the combination of the modality of the spoken words and the visualisation support. Consistent with the current implicit understanding of sensemaking and sensegiving, analysts shared their experience of using stories to convey data insights. In the absence of material support, however, the ability of the sensegiver is limited and imperfect. Storytelling supported through TTAs, the temporally distributed, multilevel cognitive work allowed HRAPs to structure and combine fragments of individual accounts into emerging stories within the larger main story. More importantly, HRAP's arguments are conversations as part of delivering stories and ‘enactment’ through material support in real time and space. For example, HRAPs illustrated their conclusions and recommendations with appropriate data visualisations. This allowed the audience to discover patterns, see trends and digest large amounts of data faster. With the support of proper visualisation, analysts produce a more compelling story by securing the consensus of stakeholders in the sensegiving phase and facilitating the required action.

The embodiment of cues and ideas in material form helped balance HRAPs individual memory limits while executing cognitive-discursive practices. Practices of material memory made selected cues and the associated experiences directly or indirectly permanently available and salient for cognitive and discursive work involved (Stigliani and Ravasi 2012). In this way, material memory helped compensate for the restriction posed by restrictive attention and memory to process all the information regarding their task. Similarly, “whiteboarding” and “templates” embody experiences and ideas for permanent accessibility and reusability. HRAPs could easily relate to experiences and ideas, connect them to their story, and reinterpret them in view of feedback from sense-receiver cognitive interpretation.

The thesis demonstrates how the entanglement of TTAs-in-use can make possible the judgment of aligning the whole nexus of sensemaking and sensegiving practices. HRAPs' work demonstrated sensemaking blended into sensegiving through materials support. The researcher noticed TTAs such as simulations, models, interactive dashboards, frameworks and spreadsheet templates previously employed as cognitive artefacts to support understanding were also used as discursive resources to help persuade and influence the target audience. Insights from this study extend this notion by pointing to the role of computational artefacts as interactive tools facilitating the transition from cognitive to discursive means, thereby facilitating the data and its interpretation representation (Cronin and

Weingart 2007). For example, interactive dashboards provide the materiality of pooling individual mental content and making it physically available to the sense-receiver to engage in. According to HRAPs, these dashboards served as evolving material representations of emerging interpretations of audiences and helped organise socially distributed cognition within the stakeholders.

Furthermore, according to participants, these dashboards provided a "common reference" for the feedback to the participants and, by doing so, helped the sensemaking process and sensegiving of HRAPs. As the recurrent expression ‘guiding them through the decision-making’ suggests, HRAPs considered the possibility of producing or reconfiguring dashboards valuable for engaging their stakeholders. The dashboard structures evolved as HRAPs received feedback from the stakeholders. This feedback enabled the processing and generation of subsequent refined content through the dashboard, which helped in ongoing sensegiving through emerging representation.

Similarly, templates and slides served as "shared interactional spaces" (Suchman 1988: 319) in which sensemaking and sensegiving progressed through conversations supported by visual representations. HRAPs utilise these templates as a collaborative tool since they might be changed or improved by someone other than the person who created them. As an interactive tool, these spreadsheet templates are the most direct way for HRAPs to help give sense to concerned stakeholders by giving form to concepts pictured in their minds. Providing a common referent to which HRAPs and stakeholders could relate and engage through material embodiment enabled sensemaking and sensegiving. Tentative additions resulting from the feedback could easily be incorporated into emerging representations, allowing to have a visible trace of these tentative additions (or deletions) over time. These findings support visual representations' coordinating role as interactive tools (Comi and Whyte 2018).

7.2.4.2 Entangling Affordances into Sensemaking and Sensegiving

The study has expanded the notion of affordances as the action possibilities and constraints for HRAPs (Fayard and Weeks 2014) when examining their material practices to support their cognitive and discursive work. When enacted in practice, the TTAs present themselves alone or conjointly bring forth action possibilities as affordances to support HRAP's cognitive and discursive practices to achieve the desired outcomes. In pursuit of exploring the sensemaking and sensegiving practices and their underlying activities, the research has reviewed affordance as a promising avenue for understanding the generative forms of cognitive and discursive practices coming together through material practices. Affordance can depict multiple co-performing human and material agencies as they take place in increasingly digitised forms during analytical activities such as data collection and processing and visualisation support for dashboards and simulations. Examining material practices from an affordance perspective provides an interesting lens for understanding the decisions, choices and solicitations of material objects for skilled analytics actors as they engage reflexively in everyday analytics activity (Leonardi 2011; Faraj and Azad 2012; Volkoff et al. 2013). Notably, the study demonstrated how all material resources/technologies are mobilised through their perceived affordance in a particular context and, in this way, to reinforce the HRAPs' sensemaking and sensegiving capacity.

The research proposes that perceived affordances reside in material practices as analysts' activity becomes understandable and meaningful (Strong et al. 2014; Demir 2015). HRAPs' perceived affordance, as portrayed in the research, served as an underlying reflective and reflexive mechanism that was put into practice by HRAPs in support of their work. Affordance in the study provided concrete action possibilities to analysts and enabled joint performance by human and material artefacts. Consistent with the findings of Demir (2015), instead of open-ended action possibilities with flexibly variable meanings and values, perceived affordances offer analysts the ability to act purposefully and engage towards their defined goal.

HRAPs see an opportunity for action through perceived affordance to realise their goals, be it through the existing affordance or manipulating it to fit the needs of the ongoing activity. For example, HRAPs used structured spreadsheets as templates guiding others to furnish data in an agreed format; they experienced a closure effect through these templates (Demir 2015), a material propensity to collect data for their subsequent sensemaking and sensegiving.

The findings also show that affordances of TTAs are effectively bundled when using familiar features of TTAs and putting them in the everyday perceptual field of HRAPs (Demir 2015). From the perspective of integrative or combined usage of tools, the thesis expands on the argument of bundled affordance (Demir 2015) and illustrates that HRAPs had to set up the TTAs. Based on the perceived affordance, this practice of setting up involves intuitively bringing together various TTAs so that their combined materialisation equips and motivates HRAPs to act upon them intuitively. The study explains this concept by showing how the affordance of different elements of ERP systems was integrated with some reporting tools for front-end visualisation purposes.

Similarly, HRAPs used Excel spreadsheets to collate and process the data where other systems were not supporting their analytics objectives. These tools and systems were made to coexist seamlessly in the same activity, operating as mutually constitutive tools or systems. Therefore, when the combination/s of the TTAs (mutually reciprocal or constitutive of one another) is/are co-enacted, the materiality of these TTAs comes forth not as material properties of individual TTAs but as bundles (Faraj and Azad 2012). Moreover, HRAPs' goals and motivations can modify or reconfigure co-performing affordances into any new combination depending on when and how HRAP and material co-performances occur. For example, the same Excel spreadsheets were used in combination with ERP systems and also used as data collection tools through the ability to collate data in a prescribed structure and format across the organisation.

The results show that enacting in situ unfolding interactive action opportunities is facilitated by the analysts' goals and motivation, which dovetails with the findings of Demir (2015). The study further suggests that when HRAPs' goals and capabilities are effectively entwined into affordance, they motivate them to behave analytically and take intuitively result-oriented actions rather than open-ended action possibilities. For example, HRAPs had obvious goals when perceiving the affordance of the available TTAs. This goal orientation directed and channelised analysts' sensemaking efforts and also impacted the sensemaking outcome. Additionally, to instigate analytics routines and activities reflexively, the HRAPs took advantage of familiarity with the existing tools and aligned them to supplement their potential affordances according to their goals.

HRAPs implicitly draw on their deep knowledge of tools and systems. HRAPs drew on a simulation tool to convey his story and engage stakeholders through decision-making when demonstrating the scenarios for recruiting relationship manager teams. Hence, familiarity with the tools secured HRAPs’ objective of reliable and timely results, thereby committing them to their goals and the continued use of TTAs. The lack of familiarity with and confidence in the tools distracted HRAPs from using them unless they got trained and were confident about their affordance fitting to the goal of their tasks. In addition to familiarity, HRAPs brought to the fore the availability of the tools within their organisation. However, understanding and availability alone do not yield the desired results unless the materials are integrated or bundled in ways to fit the purpose (Demir 2015).

7.3 Summary and Conclusion

This chapter offered a detailed discussion of the implications of the empirical findings and their relevance to sensemaking and sensegiving literature, which led to the revision of the SSF presented in chapter four. Accordingly, the chapter presented theoretical frames of reference that encapsulated this research's essential findings and discussions. The empirical findings place reflexivity at the core of HRAPs' sensemaking and sensegiving practices and confirm that HRAPs created meaning for self and others through a thinking-doing interface that provided them the capacity for reflexivity. The revised framework highlights how reflexivity reconstructs HRAPs sensemaking and sensegiving and how they think and act with the TTAs. The findings confirm that, in practice, the boundaries of sensemaking and sensegiving are permeable but also show how sensemaking and sensegiving practices are invoked to support each other. The empirical discussion confirms the cognitive-discursive dimension of HRAPs' sensemaking supported by TTAs when they assign meaning to data and its relevant cues and simultaneously communicate sense to others. While doing so, through a revised framework, the discussion unpacks how cognitive and discursive practices support each other. The researcher develops the thesis contributions in the next chapter based on the discussion offered in the chapter.

Chapter 8 Conclusion

8.1 Introduction

This final chapter presents the conclusion and the outcomes of this research project. The chapter begins with a discussion about how research aims and objectives are met to answer the research questions for this study. Furthermore, it illustrates how the outcomes of this PhD thesis contribute to the existing research about sensemaking, sensegiving and HRAPs from a theoretical perspective and how the thesis adds new knowledge to the business practice in the HRA domain. Finally, this research's limitations are discussed, and recommendations for future research are presented.

8.2 Meeting the Research Aims and Objectives

The research set out with the aim to explore how HRAPs make and give sense when executing their role. In doing so, it aimed to formulate a conceptual framework that allows an understanding of the nature and dynamics of sensemaking and sensegiving practices that may have implications for successfully executing their role. The empirical findings, analysis and discussion presented in chapters 6 and 7 helped to answer the study's primary and subsequent questions:

How are the sensemaking and sensegiving practices required as part of their role put into action by HRAPs?

The research answered the above overarching conceptual question by answering the below two sub-questions:

1. Through which cognitive and discursive activities are these sensemaking and sensegiving practices enacted by HRAPs?

2. How are analytics TTAs engaged to support the cognitive and discursive practices when making and giving sense?

As part of answering the above research questions, this research presents several practical and theoretical contributions, which are discussed in more detail in this concluding chapter. The overview of how the objectives of this research have been met is outlined in Table 8-1.

Table 8-1: Research Objectives Mapped against Thesis Chapters

S.no	Research Objectives	Chapter(s)
1	To propose a conceptual framework and research propositions based on a literature review that will facilitate exploring HR analytics practitioners' sensemaking and sensegiving practices while executing their roles.	2, 3 and 4
2	To put into practice a suitable research methodology which will assist in answering the research questions.	5
3	To develop a framework of practices underpinned by the activities and knowledge that allows an understanding of the nature and dynamics of sensemaking and sensegiving practices, which may have implications for successfully executing the HRAP's role.	6 and 7
4	To offer theoretical and practical implications and explore the direction for future research as an outcome of this research.	8

8.3 Research Contribution

The research contributes to existing research on HRAPs, as well as their sensemaking and sensegiving, by exploring their cognitive, discursive and material practices and the way in which they are manifested when performing their roles. While doing so, the research seeks to answer researchers' calls to explore the HRAPs' emerging role when managing data and exploiting it to organisation competitive advantage has been viewed as a strategic capability (Rasmussen and Ulrich 2015; Ulrich and Dulebohn 2015; Marler and Boudreau 2017; Minbaeva 2017; Huselid 2018; Minbaeva 2018; Greasley and Thomas 2020).

The findings demonstrate that studying HRAPs' sensemaking and sensegiving practices is essential because it helps to explain their role better, which has been lacking in the extant literature. From a sensemaking perspective, Pirolli and Card (2005), Klein et al. (2007) and Grolemund and Wickham (2014) show that analysts are primarily engaged cognitively in pursuit of their goals. In terms of communication or sensegiving, Pirolli and Card (2005) and Boudreau (2010) propose the mapping of meaningful facts, while Boudreau and Jesuthasan (2011) suggest the use of appropriate metaphors when communicating with stakeholders. Other researchers have recently identified analytical competencies that they consider crucial for effectively executing HRAP roles (Andersen 2017; McCartney et al. 2021).

Similarly, Kryscynski et al. (2018) suggest that HRAPs must develop analytical abilities to perform better. These and other studies do not specifically take the perspective the research has taken from the theoretical lens of sensemaking and sensegiving in varying contexts. Thus, the thesis also answers the calls for building cumulative knowledge of the role of HRAPs in varied contexts (Huselid 2018; Kryscynski et al. 2018; Minbaeva 2018; McCartney et al. 2021). From a sensemaking and sensegiving perspective, the present study provides a more profound understanding of the role by explicitly looking at the activities underpinning cognitive, discursive and material practices. The study brings to the forefront the linkages between sensemaking, sensegiving and reflexivity to help manage the complexity of the role. While doing so, the thesis makes theoretical and practical contributions to sensemaking, sensegiving and HRAP literature, as discussed below.

8.3.1 Contribution to Theoretical Debate

The findings make three theoretical contributions through a revised framework illustrated in Figure 7-1 by adding to the richness and nuance of the literature on sensemaking, sensegiving and HRAP in particular and data analyst literature in general.

The study's first area of contribution lies in reflexive sensemaking and sensegiving through a fine-grained and detailed understanding of how HRAPs perform their roles in a broader range of analytics-related contexts. The thesis extends prior research on HRAP, sensemaking and sensegiving by exploring their cognitive, discursive and material practices and offers how these practices are reflexively manifested and through which activities HRAPs perform their roles. The study offers insights into how HRAPs embrace equivocality to manage the complexity of their role. More specifically, it offers insight into how HRAPs avoid emerging phenomena being dismissed at the outset of the sensemaking funnel and how they are open to reflexive attitudes of not knowing how to create meaning.

These practices of pursuing coherence in explanations, setting up and then crafting and delivering the conversations, sensible enactment through material support and navigating paradoxes are connected through reflexive conversations with self and others to support HRAPs' sensemaking and sensegiving. The thesis views HRAP's reflexivity as a way to construct and reconstruct sensemaking and sensegiving as the fundamental organising principle of human cognition to extract meaning from the data and guide action (Boland and Tenkasi 1995; Weick 1995). The thesis argues that reflexivity was integral to HRAPs' sensemaking and sensegiving practices as they performed their role.

The findings suggest that the HRAPs' reflexivity cannot be decoupled from their sensemaking and sensegiving practices as it provides the means to achieve the desired outcomes. The study conceives reflexivity in the context of HRA as a continuous, disruptive cycle of oscillation between the complexity of thoughts and simplicity of actions and temporal movement between past, present and future occurring alongside data sensemaking routines and patterns that seek improved comprehension of the data (Kitchin 2014) in a practically reflexive manner (Cunliffe and Easterby-Smith 2004; Calvard 2016). Reflexivity has been captured between HRAPs 'thinking backwards' and 'living forward' as part of sensemaking and sensegiving when they sense, interpret and enact (Guiette and Vandenbempt 2016).

The study elucidates how performing reflexive conversations can contribute to increasing the repertoires of practitioners' sensemaking and sensegiving capabilities (Guiette and Vandenbempt 2016), developing intuitive awareness (Sadler-Smith and Shefy 2007) or, in other words, new sources of ignorance (Weick et al. 1999), and complimenting or rejecting the dominant frame of reference. The framework offers empirical evidence of the link between sensemaking, sensegiving and reflexivity while suggesting how sometimes analysts embrace equivocality and leave behind the habitual interpretation (Guiette and Vandenbempt 2016).

The study suggests how HRAPs manage the varying paradoxes and embrace equivocality while leaving behind the habitual way of interpretations to manage the dynamic complexity, more specifically, how they avoid emerging phenomena from being dismissed at the outset of the sensemaking funnel and are open to not knowing reflexive attitudes to create meaning. As Calvard (2016) explained, the cognitive disorder created by the complexity attached to analytics exercises can hamper, frustrate and even paralyse analysts. The study identifies paradoxes and associated coping strategies through the reflexive use of cognitive-discursive and material practices through which HRAPs make and give a sense as part of their role. In practice, a paradoxical mindset served as a systematic and structured means of helping HRAPs cope with ubiquitous paradox during their sensemaking and sensegiving experience.

While examining the underlying context of these paradoxical coping practices, the research expands on the previous research in paradoxes management (Lüscher and Lewis 2008; Jay 2013; Sparr 2018), exposing more intricate links between the context, paradoxes and coping strategies through sensemaking and sensegiving practices. By developing reflexive awareness and continuously applying reflexivity, the HRAPs experienced how working through paradox could help them enact a more workable solution. The sensemaking and sensegiving practice from the research exemplifies how a paradoxical mindset in conjunction with reflexive thinking helps shed new light on managing analytical challenges practitioners face. The study came to view the HRAPs' sensemaking and sensegiving in navigating paradoxes, each with a coping strategy involving cognitive and discursive patterns. By illustrating and elaborating on the contradictions and complexities of the HRAPs' role, the research demonstrates the importance of HRAPs' understanding of varied forms of paradox and their subsequent coping practices.

Second, the study suggests HRAPs' sensemaking originates neither in cognition nor social interaction alone but through cognitive-discursive practices augmented by TTAs to generate specific sense encompassing conceptual, contextual and practice continuously (Sandberg and Tsoukas 2020; Weick 2022). The research extends existing research on cognitive perspective (Klein et al. 2006; Grolemund and Wickham 2014; Zhang and Soergel 2020), mapping the meaningful facts (Boudreau 2010) and metaphors (Boudreau and Jesuthasan 2011). The cognitive-discursive focus on sensemaking has enabled the researcher to go further, recognising the necessity to go beyond cognitive practices and include the discursive patterns that govern the activities through which HRAPs accomplish their roles. By bringing cognitive, discursive and material perspectives together, the thesis provides a deeper understanding of how conceptual changes in analyst cognitive mechanisms and the range of discursive activities are enacted to support each other. The pursuit of coherence among HRAPs' observations, beliefs and actions occurs in cognitions and discourses as part of their sensemaking and sensegiving practices supported by TTAs. Further, the underpinning activities of 'pursuing coherence' and 'setting up and delivering conversations' show that these group activities are discrete yet connected through practice since they discursively and cognitively co-occur in a performance managed in a particular context to deliver a desired effect.

From a material perspective, the empirical findings lead to a better understanding of conceptual changes in practitioners' cognitive and discursive mechanisms while engaging with TTAs. HRAPs' activities demonstrate how TTAs are engaged to amplify sensemaking (Stigliani and Ravasi 2012; Parson and Sedig 2014) and sensegiving capacity (Kaplan 2011). The study suggests placing affordance at the core of the sensemaking and sensegiving practices when HRAPs are engaged in a series of practices through TTAs. From a human-centric perspective, the study emphasises that HRAPs act in specific ways to use TTAs effectively, as these material practices either inhibit the ability to achieve their goals or afford the possibility of achieving them. HRAP sensemaking and sensegiving experiences are incomplete if the sole focus is on cognitive processing and discursive practices as the content and process of sensemaking and sensegiving changed using TTAs and their affordance patterns. The perceived affordance directed HRAPs' sensemaking and sensegiving patterns and choices. Given that the concept of affordances can expand and provide some explanatory power to HRAPs' sensemaking and sensegiving practices, such attempts would also serve as opportunities to refine the concepts further.

Furthermore, the reflexive interplay between cognitive-discursive and material practices also offers novel insight into sensemaking and sensegiving around the HRAP's role. The practices and underlying activities, as outlined in the framework, suggest sensemaking and sensegiving as two mutually constitutive and interdependent phenomena to understand how HRAPs make and give sense, with the understanding that they seem to be two sides of the same coin – one implies the other and cannot exist without it (Maitlis and Christianson 2014; Schildt et al. 2020).

Therefore, the study suggests that in practice, sensemaking and sensegiving processes should not be conceived as distinct ‘ontological assumptions’ (Maitlis and Christianson 2014) but as profoundly interconnected through cognitive-discursive practices amplified through material practices. Furthermore, in response to Garud et al. (2011) call, the framework elaborates on cognitive and discursive activities in creating sense and giving sense through analytical stories. While doing so, the study attempts to address Bosma et al. (2016) question of how the sensegiver came to make sense in the first place. In this regard, the analytical stories provide a connecting mechanism through which HRAPs make and give sense. For example, the way HRAPs crafted and delivered conversations and stories cannot be understood without considering how they were aware of the diverse power, status and circumstances of others through their sensemaking. The research shows that sensegiving through storytelling is practically entrenched in cognitive-discursive acts that convert the confusion into locally situated meanings over time.

Furthermore, the thesis argues that sensegiving is an anticipatory process where HRAPs were engaged in a series of sensemaking practices supporting their sensegiving practices in anticipation that the practices will yield the desired outcomes. In addition to assigning and conveying meanings as part of the role, the study found that sensegiving also pragmatically prompts and primes HRAPs' sensemaking by giving them a way to think about the events and the situations through an anticipatory process.

8.3.2 Contribution to Practice

From a practical perspective, the study contributes to the growing debate on analytical capabilities in the emerging analytics practitioner literature by enriching the understanding of the analyst's role in general and HRAPs in particular through practical insights. Rousseau and Barends (2011); Green (2017); Kryscynski et al. (2018), and (McCartney et al. 2021) are the rare researchers who have examined the role of HRAPs from a practical perspective. These researchers provided the essential elements of the required competencies when HRAPs look at data, consult businesses, communicate findings to potential constituencies through storytelling, and so forth. However, they fall short of explaining how the role is enacted and performed in practice, i.e. the practices and underpinning activities through which HRAPs execute these competencies in their day-to-day operational activities. Accordingly, the study makes three contributions to practice.

First, for building HRA capability in organisations, the study offers a welcome social constructivist perspective on user-centred system design in experiencing technology by explicitly linking sensemaking and technological affordances. The study argues that effective systems thinking and diagnostics are essential for designing and implementing effective HRA (Levenson 2018). The findings suggest that when designing a system besides technology system architecture, organisations need to have a careful diagnosis of the critical problems facing business leaders and an understanding of the business context. After understanding the business requirements, the second most crucial step is to design the architecture based on the business and user requirements. Furthermore, from the HRA system design perspective, the value of the HRA does not only lie in the sophisticated use of technologies, gathering extensive data, producing interactive dashboards, making large spreadsheets and running complex analytics. In addition, the study argues that, the value comes from the sociopolitical ability of HRAP to operate in their context.

Second, the findings from this research can aid organisations in further maturing their HRA capabilities within their HR department by expanding the focus from viewing analytical practice as working with specialist analytical technologies and statistical tools in a socially decontextualised manner to more sociocultural practice. As findings observed, HRAPs employ a variety of practices related to their functional (HR domain), technical (analytical) and social competencies. These practices suggest that the HRAPs were navigating sociocultural and political intricacies reflexively within their respective organisation. The HRAPs' awareness of underlying assumptions about their situational sensemaking and sensegiving practices of how complexity needs to be managed through reflexivity can guide on-the-job training to enrich their repertoires of plausible actions. In this regard, findings provide an opportunity to approach learning while on the job through continuous experience by focusing on not only what elements of experience but also on the process of experience, i.e. how elements of the unfolding experience (Weick and Westley

1996; Tsoukas 2014). Organisations should facilitate enacting these social competencies by providing HRAPs opportunities to acquire and update their relational and social competencies for reflexive application.

Third, from training HRAPs and developing their capabilities, the findings from this study through a sensemaking and sensegiving repertoire can be linked to HRAPs' ability to operate in their boundary-spanning role skilfully. The sensemaking and sensegiving practices and underlying activities have considerable value from a training and development perspective, particularly in developing social competencies. The findings from the study can serve as a guide for identifying HRAPs' individual development needs when designing learning outcomes specific to the development of HR analytics capabilities. Likewise, findings will aid in informing recruitment and selection processes regarding what behaviours and competencies should be focused on when attracting the necessary talent to build their HR analytics capability.

The findings opened the 'black box' of HRAPs' roles by providing an in-depth understanding of how the role is reflexively enacted through a set of five interlinked situated materially cognitive-discursive practices. For example, the awareness of underlying contextual inferences and their impact on shaping the analytical work is critical for appreciating how the analysts' role is performed in practice. Existing research on change-related influencing context argues that sensemaking is more 'political and contextually embedded' than initially suggested (Maitlis and Lawrence 2007; Hope 2010; Rouleau and Balogun 2011). Similarly, the existing research into HRAPs' competencies, such as Falletta and Combs (2021) and McCartney et al. (2021), identified the ability to understand the business context or business acumen as one of the critical competencies. The thesis confirms and advances this insight by studying HRAPs in varying contexts.

More specifically, the study highlights the significance of cognitive, discursive and material practices and the nuanced understanding of context underpinning the

HRAPs' sensemaking and sensegiving, which have previously been recognised in the literature but not empirically developed. By expanding HRAP's perceptual field through contextual inferences and interpretations and linking analytics to business context, a more affluent and relevant inventory of plausible actions is gradually developed while making and giving sense. As highlighted earlier, the business context influences the adopted analytical approach, so there are potential benefits from an awareness of the business context in which analytics practices are performed. For HRAPs to perform effectively and transform analytics insights into actionable outcomes, understanding the context in which analysis is utilised is advantageous.

Furthermore, encouraging HRAPs to embrace reflexive thinking (Calvard 2016) may also mean training them to complement traditional technical and analytical skills, primarily based on elaborating quantitative analytical skills, with methods of applying analytical tools. The study argues that besides technical competencies, HRAPs must develop supporting social competencies around how to set up and deliver conversations to help them work with others. Unlike hard skills, these social competencies are subjective and more difficult to quantify. These social or interpersonal skills (also called people skills) deal with how HRAPs relate to and interact with others. The findings suggest that the HRAP role is a boundary-spanning role; learning these social competencies implies, at the very minimum, the ability to operate cross-functionally with the other departments/functions in the organisation and interact and manage other task-specific stakeholders from management.

The thesis also contributes by signalling caution to exponents of analytics as a purely technical role with a minimum of other social competencies or soft skills. Such visions are founded on a belief that analytics demands a more technical, analytical and data-centric skill set to add strategic value (McCartney et al. 2021). The thesis challenges such claims and emphasises the importance of other skills, such as drawing on context, political awareness, stakeholder management and data storytelling when executing the role. As a word of caution, the thesis does not claim that the applications of specific suggested sociocultural and politically sensitive practices are necessarily generalisable to other organisations. However, practical implications from this practice-based study may serve as a guide for their selective application suited to the appropriate context in managing and improving practices within organisations, particularly in building HRAPs' capabilities.

8.4 Research Limitations

The limitations of the present research include the relatively small sample size of the research participants from a single country at a given time. Accordingly, caution has to be exercised when generalising these findings from a limited sample. The present research has focused on the sensemaking and sensegiving of HRAPs across different analytical tasks and organisations. Sensemaking and sensegiving practices of professionals in other organisations may be qualitatively different because of contextual differences, accountability structure and analytical task requirements. However, although the present research lacks statistical generalisability, the researcher does feel that it can be used for "naturalistic generalisation", wherein, without making any statistical inference, one recognises similarities and parallels between the tasks and contextual conditions and the induced framework and those of other cases (Stake 1995).

A further limitation of the study relates to the predominately retrospective nature of some recorded sensemaking accounts. Based on the timing of accounts (i.e., before, during or after the activity), they may differ in content due to mechanisms mediating the narrative of practice interviews. The conversations during phase 2 of the extended interviews provided empirical evidence on situ sensemaking and sensegiving practices, particularly the material perspective and their accounts, to help mitigate the limitation of the retrospective nature of the account. Furthermore, the researcher reflexively recognised that interviewees might be engaged not merely in recounting facts or experiences but in political action in constructing versions of themselves both for self and researcher (Alvesson 2003). During the interviews, HRAPs' narration in the form of both situ and retrospective sensemaking was not completely devoid of certain biases. For example, interviews were not free of preferences in the form of self-presentation behaviours such as impression management to influence others' perception of self (Schlenker 1985) and the tendency to attribute favourable outcomes for their actions to self and adverse outcomes to external influences (Bettman and Weitz 1983).

To help manage this limitation and enhance the reliability and validity of the research, the conversations and show and tell approach during the second phase of the interviews when using analytics tools, multiple informal conversations with participants both at their place of work and in informal settings, and review and analysis of company documentation in the form of reports, dashboards and presentations. All this is to say that the data collected in this thesis is the outcome of multiple processes of 'mediation' by the researcher and the research participants, as is the case with all other research endeavours.

8.5 Research Future Direction

As with all studies, further work is needed to confirm and develop the insights from this thesis. Further research may now transcend to varying contexts and different size settings based on the relevance and application of the insights provided by this interpretive research for additional empirical evidence. To further develop the research started here, this study needs to be extended from the HRA context to other contexts where analysts play a significant role in helping identify if there are any additional or different generic sets of sensemaking and sensegiving practices and extend the cumulative knowledge about them. Further research on analysts' cognitive, discursive and material practices in situated sensemaking and sensegiving required as part of their roles may also try to test the framework with a bigger number of analysts through a longitudinal research design.

Additionally, temporally and spatially comparative studies might provide a valuable means of evaluating and building upon the findings presented in this thesis. The researcher does not suggest that the sensemaking and sensegiving practices identified are exhaustive, nor that the material practices analysts engaged with are the only ones that might be used. There is a need to examine further how cognitive-discursive perspectives are enacted (Sandberg and Tsoukas 2020), focusing on how sensemaking and sensegiving practices co-occur and inform each other (Bosma et al. 2016).

Future studies may also extend the current research insights and investigate more systematically by including other stakeholders, such as business managers, to explore collective sensemaking and sensegiving patterns during the analytic process. Future research may also purposefully choose settings characterised by the underlying conflicts of interest among stakeholders to examine the interplay between sensemaking, sensegiving practices and political processes in more depth. Researchers interested in more micro-level processes may try to isolate the influence of materiality, such as visualisation support, on sensemaking and sensegiving using experimental research design.

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APPENDICES

APPENDIX A – Letter Requesting Participation

Dear <insert name>,

I am researching Human Resource Analytics as part of my PhD studies. I am studying how senior human resource analysts perform their roles by exploring their sensemaking and sensegiving. Organisations are keen to actively engage in programs that leverage data for workforce planning, talent management, and HR operational efficiencies due to the widespread availability of tools and technologies. Deloitte's (2017) survey found that 71 per cent of HR professionals rate HR analytics as a high priority. In contrast, only 15 per cent are deploying analytics to employee issues, mainly owing to a lack of readiness to target the analysis for generating insights that matter most. The research seeks to enrich our understanding of the HR analyst's emerging role.

I request your participation in the study, which involves an interview conducted in two phases at a convenient time. The first phase of the interview may last between 60 to 90 minutes, and participants will be asked to share their experience of making sense of data and their learning while analysing the HR data as part of their analytical role. The second phase may last 2 to 3 hours, depending on how the conversation develops. The total time commitment to this project is approximately 4 to 5 hours, depending on how the project unfolds. Enclosed is a brief description of this research and the information essential for you to know. If you might be interested in helping, please email makhan31@bradford.ac.uk.

Thanks for any time you can give.

Sincerely

APPENDIX B – Research Participant Information Sheet

This information sheet is intended to give you information on the research project, its goals, the researcher, and what you will be asked to do as part of the research. Once you agree to participate in the study, then based on this, you will be requested to sign the consent form regarding your participation in the study. This project conforms to the Handbook of Research Ethics of the University of Bradford. You recognise that participating in the study is free of charge and that there is no payment or other benefit. Please contact the researcher at makhan31@bradford.ac.uk if this sheet does not address any queries.

What is the title of this research?

Reflexive Sensemaking and Sensegiving: An Exploratory Study of Human Resources Analytics Practitioners

Who is the researcher?

PhD student Manzoor Khan is conducting the research, currently pursuing his studies at the University of Bradford.

What is the research about?

The study examines HR analytics practitioners' sensemaking and sensemaking practices while executing their roles. The fundamental question to be answered is: How are the sensemaking and sensegiving practices required as part of their role put into action by HR Analytics Practitioners? The research involves understanding and explaining the practices and their underlying activities by which analysts make sense of their analytical experience as part of their role.

Who has been invited to participate, and why?

Practitioners performing the role of senior HR analysts in their respective organisations have been invited to participate in the research. These practitioners have been chosen because of the relevant experience required for the research.

What will research participants be asked to do?

Participation in this study is entirely voluntary at the discretion of the individual practitioner. There are two stages of participation. In stage one, participants are expected to participate in interviews lasting approximately 60 to 90 minutes. In the interview, participants will be asked to share their experience of making and giving sense while analysing the HR data as part of their analytical role. The participants may be asked to share any documents in support of their analytical work.

The second phase of the interview participation may last between 2 to 3 hours, depending on how the conversation develops. This study's expected total time commitment is approximately 4 to 5 hours, depending on how your project unfolds. You know your participation is entirely optional, and you have the right to revoke your permission and stop participating. All data gathered about you that could be used to identify you will be destroyed and deleted from the research database if you decide not to continue the study. You will send the researcher written notice of your withdrawal. Any interview question may be skipped at any moment. You recognise that participating in the study is free of charge and that there is no payment or other benefit.

How the confidentiality and sensitivity of participants will be ensured?

In two different ways, anonymity and secrecy will be protected. Data will first be reported as an aggregate. The participating organisation's identity will not be revealed. Verbatim statements from the participants will be anonymised (e.g., "a participant said"), and identifying clues will be eliminated when used to illustrate conclusions. Second, individual data will not be maintained in electronic files with identifiable names, and project data involving transcripts of interviews and files containing other sensitive information will be kept on a password-protected researcher's personal computer. As this project will involve HR analytics projects, it is possible that you may not want to share sensitive information about yourself or the organisation. This might include, for example, attrition data, individual talent assessment data, and succession plans. This possibility will be addressed by providing options to you to share dummy data for illustration purposes and remove individual identities wherever required. Manzoor Khan, the researcher, will try to address any issues you may have to satisfy you.

What will happen to the information provided by research participants?

Digital recordings of the interviews will be made, followed by transcription. Your identity will not be made public in the study. You will have the option of getting a copy of the audio recording, and you can ask to get a copy of the transcription of your interview. You can ask for a specific piece of data to be removed from the study at any time, and the researcher will take that information out of the study's files and consideration. The consent forms will be kept in a locked drawer at the researcher's house because they may reveal participants' identities. After the study, consent forms will be destroyed.

What will be the outputs of the research?

The primary outcome of this student research will be a PhD thesis. Additionally, this research may be presented at conferences or other educational settings and published in academic journals.

APPENDIX C – Research Participant Interview Consent Form

Thank you very much for agreeing to participate in the research. This form aims to ensure that you, as a research participant, are happy to participate and know what is expected of you.

Research Area: Sensemaking and Sensegiving Practices of Human Resource Analytics Practitioners

Researcher Contact details:

Manzoor Khan: email at makhan31@bradford.ac.uk

S. no	Please tick the statements as appropriate	Yes	No
1	I confirm that I have read, comprehended, and had the chance to ask questions about the information sheet for the study, as mentioned above.		
2	I know that my participation is optional and that I can withdraw at any time up to 04 weeks after the participation without giving reasons, leading to my data not being used in the research.		
3	I agree to the audio recording of the interview.		
4	I understand that any information identifying me or my organisation will be removed from the research.		
5	I know that anonymised data will be kept securely by the researcher on his personal computer.		
6	I consent for anonymised extracts from interview/s to be used in publications/conferences reporting on the findings from the research.		

Name of Participant: ______________________

Signature of Participant: ___________________

Date: _____________

APPENDIX D – Extended Semi-Structured Narrative of Practice Interview Protocol – First Phase

Theme	Interview Question
Opening Questions	1. Briefly, what is your role in the company? 2. Please describe the business challenge or problem you need to solve through analytics insights. 3. How would you describe your experience of making and giving sense of data in this task?
Return to Narrative Questions	1. How did you go about understanding the business context of your analytical task? 2. How did you collect and organise the data required for your task? 3. How did you develop your hypothesis for analysing data? 4. How did you draw your assumptions regarding the data interpretation? 5. When, how and why did these assumptions change or stay the same? 6. How did you discover meaningful patterns in your data? 7. When and how did you recognise that your interpretation of the data is complete? 8. How was your experience of interacting with business managers in terms of understanding the business context of your project? 9. How did you communicate your findings to your target audience? 10. How did you ensure the relevance of your interpretations to the business context and drive required actions? 11. What methods did you use to communicate your findings to the target audience? How did you execute them? 12. Please describe the experience using IT tools and other resources to make and give a sense of data. 13. How did you decide on these tools and resources? 14. What typical challenges do you face using tools, and how do you manage these? 15. While reflecting on your experience, what are your key takeaways from this task? 16. When you reflect on a situation where you had to manage various challenges, describe the experience of learning from them.

APPENDIX E – Sample Transcript Extended Semi-Structured Narrative of Practice Interview Phase 1

Manzoor Khan

Briefly, what is your role in the company?

Respondent 11

I am the head of our global analytics workstream, which means I lead the analytics teams primarily based in Europe, the US, India, China, Australia and the United Arab Emirates.

Manzoor Khan

Please describe the business challenge or problem you need to solve through analytics insights.

Respondent 11

Okay. In terms of that detail, there are also specific details of the project that I cannot disclose. So I will tell you as much as possible. We are a large financial services institution. We have relationship managers looking after small to medium-sized enterprises; a medium-sized enterprise could be anywhere between a few 10s of employees up to, you know, 1000 employees and a large could be above 1000 employees. Relationship managers and sometimes teams of relationship managers look after those clients. The question we got was straightforward to help the business managers identify the profile of their most successful relationship managers. So, that would inform recruitment and other talent management decisions going forward.

Manzoor Khan

Great. How would you describe your experience of making and giving sense of data in this task?

My organisation has excellent data sets. That was one of the pleasant surprises of this project. So, we had a range of psychometric and cognitive assessments combined with performance data. We also had the financials per customer relationship and net promoter scores. For me, it was critical to reach out to varying modules in our ERP system to pick the right data points. At the start of the recruitment process for all relationship managers, the HR team documented the recruitment process well. And then, every three months, the performance management system had a fairly comprehensive set of documentation around relationship managers, including customer feedback, self and manager feedback. Furthermore, the compliance on that is excellent. Yeah. So, we had a data point regarding every relationship manager's performance every three months. And then the other thing that made it nice was that it was fairly straightforward, linking that data set back to the commercial outcomes. So, the organisation measured the net promoter score at least once a year with all of the customers and, in some cases, four times a year with some larger, more strategic accounts. We also had the financials on a per-customer relationship basis.

So, we thought it would be a straightforward exercise, right? You know, to look at all the psychographic and demographic data that we have for the relationship managers, and then, you know, run a basic analysis to, you know, predict good relationship outcomes. As we moved into the project and examined various data streams, we quickly spotted that data offered us more than that, so we had to refine our scope accordingly. The first iteration of the analysis did not produce anything interesting. Alternatively, it did not produce results which we could not make much sense of.

We ran a clustering algorithm and got our initial seven clusters down to three, which was helpful. The first cluster was inexperienced, entry-level relationship managers who typically have maybe one or two years of work experience and finished university less than five years ago. In the second group or cluster or segment of relationship managers, we found experienced relationship managers having 5 to 10 years of experience in the financial services industry. They have worked with other banks before. They have been with this particular organisation for a very long time. And then we found a third segment that was quite interesting, you know, they were, let us call them left field hires; this is somebody that was not in financial services, worked in another job. One guy was a physicist, and he started working as a relationship manager because he could make more money. These people are generally in a process you would not recruit. So, we identified those three segments that tend to be more successful than the average relationship manager through our clustering.

And then, you know, we could identify variables in there. So, for example, for the entry-level relationship managers, we identified that in many ways, with them, there is a specific set of behaviours around connecting. They connect a lot with people around them; for example, senior leaders in the business actively seeking coaching and mentoring opportunities. As a result, these behaviours tend to be more predictive of successful relationships than new entrants that tend to isolate a bit. So you know, that is one example of something we saw. For experienced managers, we noticed some of the behaviours and traits we picked up in performance and psychographic data related to storytelling, so they were effective at relating stories of successful relationships or initiatives. So, they tended to be more successful when they were particularly effective at storytelling. And then for the left field hires, we identified some behaviours around both, you know, connecting and frequent storytelling, but then they also add a capacity to develop a completely different set of relationships. So usually, the relationship managers would develop relationships with the CFOs or the financial teams in their business, whereas the left-field hires could develop relationships much broader across the C suite in their client organisations. So, there was something different around each of these three groups. That thing changed the question for the management in terms of, okay, well, that is great, but you know, help me understand whom should I appoint, should I go for inexperienced, or should I have experienced or left field hires. Furthermore, that is when we started looking at the economics of it. So, with the inexperienced appointments, your return on that investment was fairly quick. You know that you got a return, but then the attrition rate on the inexperienced appointees that were successful was also slightly higher. So, some signalling happened to the market that this person is a good relationship manager and that maybe other banks would come and approach with something along those lines. With the experienced hires, they were the least economical of all of their hires. They are getting paid a lot. So the return on investment on an experienced hire was much lower than on an inexperienced one, but they tend to stay much longer. And then, for the left field hires, the economics was interesting. There was much volatility; they were either very profitable with a great return on investment to the business, or they were very unprofitable.

You know, that sort of thing created a question in terms of optimisation. To help answer, we created an optimisation model to work out the optimum mix. Sorry, before we did that, we ran some graphing network analysis. Furthermore, we used emails and would go inside those emails with three-month data points for the performance cycles. We could look at six data points, where they sit in the network, and how a network's position moves over time. So the interesting thing, and this is where the connected behaviours for the inexperienced employees came in, is you could see inexperienced employees start on the network periphery with fairly few connections and then strengthen those connections. And then fairly quickly, within nine to 12 months, they find themselves positioned much closer to the centre and much closer to an experienced individual. When we looked at the left field hires, the effective ones, the same thing might start on the periphery, but then they move fairly quickly close to an experienced hire. So it is almost like both successful, inexperienced and left field hires found a way to quickly identify the experienced hire that will give them the best coaching and mentoring and move closer to it. If you compare that to the inexperienced hires, for example, who were unsuccessful, they tended to remain on the periphery, or they gravitated towards an experienced hire that was low-performing themselves.

So, I think we found that this is an optimisation problem. This is not the case having either of these three relationship managers. There is probably a combination of them that will be the optimal mix. Then, we ran a simple optimisation exercise building a decision tree that showed them that, for certain positions of a specific type of relationship, you are better off going for certain combinations of inexperienced with experienced hires. Then, we used simulation for the leaders in Excel to show them various combinations of profiles and how these combinations will impact their net promoter score and customer satisfaction levels for their clients over time. We landed on something like a three-to-one. So, for every three inexperienced hires, you need one very experienced hire, and you can afford to gamble on one left-field hire. Then, we showed a level simulation for the leaders to show them that if they do this over time, how will it impact the customer lifetime economic values at the customer satisfaction levels for their clients? Leaders could change the ratio from three to one or three to two. Some more left field is to see if they can do things or if they were particularly risk averse, they might say let us go for two inexperienced. That seems like a good ratio. So they could play around with the ratios to see what they wanted to do and the outcome of that measure.

Manzoor Khan

Now, let us dive a little bit into details over here. My first question is, what were your assumptions when you looked at this data? How did you draw your assumptions regarding data interpretation?

Respondent 11

Yeah, that is a good question. So, first of all, it was the exploratory analysis, where we could not pinpoint one profile that predicted success across the board. From the exploratory analysis, we noticed that there are distinct patterns. And then when we sat down with one of the managers and went through and said, That is interesting.

So, through discussion, mainly through exploratory analysis, and mostly through interactions with business leaders, we came up with the idea to run some clustering. To begin with, I had seven behavioural patterns in the data. And then, we reduced them to three as I went through several iterations with the data. Eventually, we settled on the three behavioural patterns by examining different trends and patterns in the data. Even when we settled on the three, there was a favourite we still needed to do to help it fit a good narrative and story as everything went through. Okay, that string gives us some ideas that this profile tends to be primarily inexperienced hires. And then we took it one step further. Well, it is just, you know, exclude some of the noise and focus on inexperienced hires in that particular cluster. So, I can tell that if we pull out a very specific process to identify and clarify our assumptions, it was probably just more iterative process discussions amongst ourselves and the business leaders, but eventually, we settled on three of these three categories. Does that make sense?

Manzoor Khan

Yeah, okay. Furthermore, besides the psychometric data you had and some commercial data, you started drawing the link between them. Were there any other sources of data?

Respondent 11

We have really good demographic data. My organisation maintained HR data well. We added the customer to the Net Promoter Score data set and included customer commentary. However, we had that data available. We had the engagement data for all these relationship managers. We had the commercial data for the clients available, although somewhat limited, you know, it just showed the number of products and average balances. We wanted a few more things, but the finance team was unwilling to give it to us. And then we also had the email to and from metadata available for the social network analysis. We also had the text data from the engagement survey, which we ran for the organisation. So we had the data readily available and see what else would be available. Diversity data, we had that available. So, we could see ethnicity, religion, sexual orientation, all of that.

Manzoor Khan

How was your experience of interacting with business managers in terms of understanding the business context of your project?

Respondent 11

In this case, we spotted a reasonably high analytics IQ stakeholder who understood what we could do and the fundamental premise that there are no guaranteed results but had an excellent understanding of the process we could follow. In this case, our stakeholder was also somebody who carried a fair bit of influence throughout the business and could, without too much fuss compared to other stakeholders, actually get his hands on the data we needed. So that was effective. Some of the other stakeholders we dealt with were probably put into groups where they were the ones that were like let me know when you get something done. I do not want to get into it. And then the group that is probably slightly more sceptical and saying, Well, yeah, there was one particular GM that has got a really good sense from working about 35 years in the business, and what makes a good relationship manager what doesn't, so he was sceptical around the analytics and, and the approach that we followed, so we had to do a fair bit of work with him to help get him across the board. The other stakeholder group that we worked with was the finance team. So, we had to request customer-level data around specific financial metrics. Furthermore, the finance team had some significant concerns around data privacy, giving us access to financial data at a customer level. So, we had to go through about two months' worth of reading contractual agreements to get the financial data at a customer level, which was probably the most painful part.

Manzoor Khan

How did you develop your hypothesis for analysing the data?

Respondent 11

We had initial conversations with the project sponsor to develop a hypothesis around what they believe a successful relationship manager would look like. However, on the advice of our main stakeholder, we then picked the number of variables, mainly on the psychographic side and most of the other behavioural elements we could get from the performance data. So, we picked a number of variables and used them in our regression models. We then started ignoring other variables, things like age, sex, location, you know, those kind of things. To be fair, what we did do, as part of the exploration, we sort of just iterated through the data set to check whether there were any really interesting correlations or relationships between some of these variables, like net promoter score. We then reduced the number of dimensions narrowed down to 15 variables, mostly related to psychographic and behavioural data points from the performance perspective.

Manzoor Khan

Can you give me an example of some dependent and independent variables here?

Respondent 11

The dependent variable we looked at was the net promoter score. Other customer analytics teams have identified a strong relationship between net promoter score and customer lifetime value. So we did not have to go down that route; we could just sort of stop and provide the score. And then, some of the independent variables that we looked at that related mainly to the psychographic data survey, there were few things in there. First off was the personality dimensions. So it stayed nine scales on many things like conscientiousness, industriousness, extraversion, and introversion, that then measured through various instruments; we had the same with the authentic assessments. So, we included that as well. Then in terms of the behavioural data, we used the evaluations from the managers from both the engagement and the performance evaluations on the company's leadership behaviours and capability models. So that would include things like responsiveness as one of the behaviours. The other one was regularly seeking out help from colleagues.

Manzoor Khan

Okay, now let us move on to communicating findings to your stakeholders. So, how did you communicate your findings to your target audience?

Respondent 11

Yeah, I think there are probably two perspectives. The first one is that we had a stakeholder who, as I said, had a high analytics IQ. And we kept him informed throughout this process. As you may have observed, he preferred to get in on our session. So we had one weekly session as a team, where we would get together and share some of the outputs of our project, and he would regularly join these internal private sessions, where we looked at, you know, not the raw data, but the analysis that is not yet ready for management consumption. So, when we finalised the results and outcomes, he had a strong sense of the data and the output and was bought into it. So we did not have to do much convincing with him. Establishing rapport and connection with a person of decisive influence was critical for me. The role that he played made sure that we stayed relevant in terms of the kinds of questions we wanted to answer. He had a solid, visceral sense of the data and the outcomes and bought into it. He then managed to exercise his influence to our advantage. You must have also observed that he had these conversations to set up things for us. So, he set the groundwork well for us. In terms of the process we went through is based on a design thinking process. So once we have got, you know, everything that we want to do, we run a design thinking process to sort of come up with a storyboard for what we want to present. And then we develop a story around it. Also, figuring out stakeholders' interests and data literacy levels during the course helped attune our communication of the findings accordingly.

Moreover, the design thinking angle is that we specifically put ourselves in the minds of our stakeholders, who will consume our data and insights. Furthermore, on the whiteboard, we would draw up the different personas. So you know, we had executives, and then we had regional managers, the ones that the relationship managers report to, and we sort of, you know, as we tell the story. We would go through what other kinds of questions, objections or insights we want them to have. And then, from that, we constructed our narrative. That process takes us about maybe two days on a simple project. In this case, it took us about five days to work through the process of creating the decks and the stories for consumption by our stakeholders. I was keen to stay relevant and develop a compelling story about my findings by clearly demonstrating the linkage between various combinations of relationship managers and net promoter scores.

Manzoor Khan

How did you ensure the relevance of your interpretations to the business context and drive required actions?

Respondent 11

Yeah, that is a great question. So, um, the first one is a highly influential stakeholder that was across the process, all the time, the role that he played, he made sure that we stay relevant in terms of the kind of questions we want answer related to business context. The second part demonstrated the linkage between findings and net promoter score. So, in the simulation that we developed, we could show them that by maintaining a mix of three to one, they would affect an increase in net promoter score of x percentage. So we just made sure that we continuously maintain, you know, that emphasis on the relationship to net promoter score. We know that these are the kinds of decisions you make. Also, there was not one successful profile; there were three successful profiles. However, these profiles are only successful if you have a mix of combinations. So, this is how you influence the stakeholders' decision-making process: taking them through it rather than only giving them data-driven insights. We were able to, I think, get them to a point where they go, Okay, that makes sense.

We could inform our recruitment process accordingly. The findings can help us to improve our mentoring programme for relationship managers. Those are the two main things that were programme-driven initiatives that resulted from this programme from the study for this project. Furthermore, I will probably put it in the prescriptive because it is essentially trying to prescribe an optimal mix for the three success profiles to the business. However, I guess in many cases, it would depend on how the manager, or the leaders in this case, view the context within which they view it. So, I would undoubtedly put it in the prescriptive category, but yeah, I guess, ultimately, it depends on the business.

Manzoor Khan
What methods did you use to communicate your findings to the target audience? How did you execute them?

Respondent 11
Yeah, so in this case, it was just that our media was a PowerPoint deck. We did not publish our results on Tableau or, you know, any dashboard. It was just a PowerPoint deck. That was one media. The other one was a simulation. So we spent about two and a half hours with the managers. In the morning, we ran them through a simulation, which we put together in Excel, to show them the optimum mix of experienced, inexperienced versus left hires and their combination. We did it in Excel because we had to find something that could run on a laptop. It took us about a day and a half to put that together. So, that was the other media that was quite successful because PowerPoint was one-directional, primarily communication.

However, when we got them into the simulation, we explained the parameters and variables they could change. One of the variables was their level of risk aversion or risk affinity; they could then see how being more risk averse or risk affinity would impact the economic value added on a per client or the net promoter score over time. So, they loved playing with the simulation tool and getting into it. That was the other media. The other method that we used was we had the initial communication. And then, we had individual follow-up conversations with each regional leader, and every regional leader has an average of about 20 to 30 new appointments they must make yearly. We went in with their specific data and showed them how to optimise for economic and customer outcomes.

Manzoor Khan

You mentioned this thing, the design thinking model. Can you give me some examples that help me understand the thought process of adopting this model to communicate certain findings?

Respondent 11

Yeah, I just said the design thinking process is something we embed throughout the time analytics process. So it is not just in the communication. I do not know who coined the term. I was conscious of a big coefficient trap and adhered to abductive instead of deductive thinking. So, you know, when you run a model, you might see that one variable popped out as very, very predictive or having a strong relationship to something. And then you might base your entire set of recommendations around that one variable or those two or three variables, and you would think I have done a great job. There might be a solution sitting just outside the variables you chose to include in your model. To help counter this, you need some abductive thinking, not deductive. So we would often, once we sit down, we would say, you know, what else could drive, explain and inform how can we achieve better outcomes. So we would primarily use design thinking as a creativity tool in that process.

I am no expert on design thinking; it has helped us to think through the process and run through a fairly structured five-step or six-step process to work through it. In terms of design thinking one of the fundamental tenets of design thinking is to develop the communication strategy. You start with your customers in mind, the questions they want answered, and the decisions they need to make. So we would then apply the design thinking process to start with that, okay, we have done the analysis, now we have done everything, now how we need to position this to help make decisions.

Very honestly, Manzoor, this particular project, I think, was done very well. However, for many of our projects, we fell into the trap of being data-intensive. And not necessarily considering the real problem to be solved and the decisions our business leaders need to make. And then, when you finish the project with a 35 to 60-page PowerPoint deck that nobody can make sense of, which is ultimately meaningless. We suffered from that as well. That is why we brought the design thinking process to help keep us honest and help us avoid getting trapped in extensive data volume.

Manzoor Khan
How did the design thinking process help your analysis?

Respondent 11
It helps to focus on the objective function of the outcomes we must achieve. So, just as we crafted the story, design thinking was instrumental in helping us move from analytics, language and analytics thinking to business language and storytelling to help us make that transition. The transition is not natural, not for analytics professionals. So, I think design thinking was more of a process for me to move away from our left brain, which is very cold, rational, logical, and connects with the more visceral, intuitive side of our brain as part of our analysis that we could present to managers and leaders.

Manzoor Khan

You mentioned that you faced challenges in getting drawn into data. So, in your experience, what is the reason why there is a trap for analysts like getting drawn into the data?

Respondent 11

I think it is because we love statistics and modelling, right? We love the fact that we can come up with very elegant solutions. We have the necessary degree of data literacy and statistical literacy that things make sense to us. As an analytics team, we can comfortably talk about regression coefficient scores, decision trees, segmentation, clustering, etc. It makes perfect sense to us; it is a very comfortable world. We want to demonstrate our ability with the new tool; we want to demonstrate that, you know, we have got this little script developed that can do these things so much faster, so much better. These things are cool to us as analysts or analytic specialists. However, they mean very little to the stakeholders. I find it is often necessary to remind the analytics team that they need to answer questions and facilitate decision-making rather than roll out new tools and play around with interesting new things. So, I guess that is one part of the answer.

Second, you do not have the luxury of having clear questions, decisions or hypotheses upfront. I have not yet encountered an analytics project where you start with a question upfront. And you only answer that question. That only happens in very, very small, narrow projects. But if you have larger projects with strategic relevance, you might start with one question. As you review the data, you want to add and change what you learn. So having a good stakeholder on that journey with you is very important. Without that, stakeholder analytics teams get lost. They do not know how to adjust and adapt, and they go down the wrong, they are going the wrong direction. The other thing I thought was important was keeping the analytics team honest by following the agile process. You cannot just leave the analytics team to run off a standard project. When we put the team into Agile Project environments, it became easier to deal with surprises through constant learning, adjusting and adapting as you go through the data. That constant adjusting, adapting and then using a design thinking approach helped the analytics team adjust weekly or bi-weekly, depending on how long the sprints were. So that was useful. Those teams that organise themselves by traditional project management principles tend to struggle more than those that are organised by and for project management principles. We need good stakeholders who can keep us honest about the question, and we can learn from them.

Manzoor Khan

Please describe the experience using IT tools and other resources to make and give a sense of data.

Respondent 11

So, the kind of tools and resources have we used? That is a good question. So, there are a few that we have used. In terms of data extraction, data manipulation, and so on, the vast majority of my team used Excel for data manipulation. I just found it much easier, you know, to do things in Excel. You do your basic manipulation of the data set in Excel. And then, when we came to the actual model building, using R and Python. Python was used, particularly for natural language processing. For some reason, we just had better scripts available for that. However, R was used for, you know, the basic modelling applications like regression.

Manzoor Khan

While reflecting on your experience, what are your key takeaways from this analytical task?

Respondent 11

Yeah. So, formally, we have a post-project review with our stakeholders. And, you know, that could be anywhere between one and three different sessions. As happens with all of the major stakeholders, we would go through an exercise to identify with them the basics of what worked and what did not work well on this project. If we could execute this again, what would we change? So, that is a process that happens with the stakeholders. Then as a team, there is a process, following the completion of each project, that provides each other feedback regarding the contributions. And then, we also have a process regarding our performance management system. We will look at both utilisation as well as contribution to a project. Then, team members have to rate each other on their relative contribution to a project using a straightforward five-point scale.

Manzoor Khan

When you reflect on a situation where you had to manage various challenges, describe the experience of learning from them.

Respondent 11

I guess the one thing I took away from it is that I never expected it to become an optimisation problem. When I looked at the parameters of the project mandate, I initially thought it would be very simple. We will produce a profile of a successful relationship manager in a business banking environment. We have got great data; it feels great. Be very clear on what you want to achieve with a project throughout. The other thing is the value of a great stakeholder, as I would say a great stakeholder is as important if not more important than having great data. So, you know, that was a real asset for us in the business. And then finally, and I think as analytics professionals, we get into a mindset of just thinking in terms of results, not models. In the end, when we applied the optimisation model, that was much more useful to our business, rather than we could easily have picked up the answer yes to the three profiles we found. However, when we added the model, it showed them how to optimise between the three profiles. That was useful. That was the one thing that turned it from a nice-to-know, interesting project into what is now relevant to me; I understand how I need to adjust my recruitment processes to achieve specific targets and why we need certain coaching and mentoring relationships to happen. So, the modelling aspect of that model thinking aspect that sits on top of just the normal results was another excellent learning point.

Manzoor Khan

Okay, great. That is all from my side; if you have anything to add.

Respondent 11

Now, I think you interrogated me quite comprehensively.

Manzoor Khan

So, thank you very much, once again. Have a nice weekend.

Respondent 11

Good luck with your PhD, and enjoy the rest of your weekend.

APPENDIX F – Sample Extracts of Participant Views During Second Phase of Extended Semi-Structured Narrative of Practice Interviews on Sensible Enactment Through Material Support (from Researcher Notes)

Respondent 6

It was not necessarily data warehouse-driven as much; I would probably be pulling some things from a data warehouse. However, I also had to build many shadow spreadsheets, pulling them together, mashing them together side by side, and combining them through a unique identifier. As you can see, I had to build many spreadsheets, merge and combine data, and then slice it out for different people's needs to meet different requests from different requesters in the institution.

Respondent 8

As you can see, it will help if you tailor your dashboards as per the audience, whether it is new entry-level employees who are navigating the organisation for the first time, or it is an employee who wants to understand the structure of the team or an experienced manager trying to know what headcount is available and how that relates to his future workload requirements.

Respondent 11

Let me show you the simulation for the leaders to demonstrate that if they do this over time, how will it impact the customer lifetime values and client satisfaction levels. Through this simulation, I showed them how to change ratios between different types of relationship managers and their impact. So we spent about two and a half hours with the managers. In the morning, we ran them through a simulation, which we put together in Excel to show them the optimum mix of experienced and inexperienced hires. We did it in Excel because we simply had to find something that could run on a laptop or a set of four laptops for the managers during the morning. It was super fast, as it took us about a day and a half to put this together.

Respondent 12

Instead of Excel, I am using Alteryx to generate forecasts from the model created for a specified number of future periods and then load them into our Tableau server so that this can be accessible to a broader audience. Alteryx is not cheap, but it is amazing. I think the great thing about it is, and I am sure you know, Power BI can do many similar things. However, as you can see here, the great thing about it is that once you create a workflow or work instruction on your data set, you can apply it to multiple data sets. So you can go through all of the parameters and pieces you want to map out; how do you want to map it? What do you want it to look like? It is very easy to use, you can click, you know, add a field lead to feel like you can go through all of this stuff. So it can have a multi-purpose output. And then you can lift and shift it for other analysis. So, you can take data sets from different systems with similar fields and run the same analysis over them. Here is how it works out in the system for building, compiling, and cleaning your data. It allows you to do all of that. And then the cool thing about it is that you can publish it in whatever format you want. Moreover, you can publish it directly into Tableau, which builds our dashboards.

Respondent 26

Getting hold of the right of the right tool is quite critical for analysts. Data analysis then becomes faster and easier with better quality. In my view, they are essential to properly bring the analysis to a higher level in terms of the quality of the analysis and ensuring the data's correctness. This excess database tool is designed to store data. You can build a relationship, you can build a query, and you can build validation to it much better than you would in a spreadsheet. And if you, for example, even combine access as a database back end and Excel for the front end analysis, you are already in a much better place than storing everything to a (Excel) sheet, as it will allow you to do things much better.

Respondent 29

This dashboard is published to Tableau, and you can publish to Power BI, all with a simple click. So often, we have to create different charts. I can show you, for example, that we need to do sales by store, and by clicking one button, you can create that chart for every single store. Then I can send that off the PowerPoint or with our reporting suite of tools. I can also email it directly to my stakeholders.