

RESEARCH ARTICLE

Human resources analytics: A legitimacy process

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Abstract

Taking a grounded theory approach, this paper explores human resources (HR) Analytics legitimacy in three organisations over a period of 3 years. The research aims to investigate (i) how the HR Analytics legitimacy process presents and develops and (ii) what decisions, activities, and events can shape the legitimacy of HR Analytics in organisations. We draw on institutional theory and industry creation literatures to understand what constitutes HR Analytics legitimacy through a three-dimensional perspective: cognitive, socio-political, and technological. A process theory lens as an analytical tool allowed for the mapping of the institutional process in order to isolate key individual decisions, activities, and events over time. Three related, non-linear sub-processes of HR Analytics legitimation are identified, namely, HR Analytics as a strategic commitment, the HR data infrastructure decision, and the focus of HR Analytics projects in addition to a number of delaying, enabling, and accelerating elements that influence this process.

KEYWORDS

data infrastructure, HR Analytics, HR strategic added value, institutional legitimacy, multi-staged process, multi-stakeholder, process theory

Abbreviations: BI, business intelligence; CEO, Chief Executive Officer; CPO, Chief People Officer; GDPR, General Data Protection Regulation; HCA, Human Capital Analytics; HR, human resources; HRBP, Human Resource Business Partner; HRM, human resource management; HRIS, Human Resource Information System; IE, Ireland; IT, information technology; KPI, key performance indicator; MBA, Master in Business Administration; MD, Managing Director; MIS, management information systems; PM, product management; US, United States; VLS, Voluntary Leave Scheme.

Open access funding provided by IReL.

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1 | INTRODUCTION

While the concept of human resources (HR) Analytics has existed for over 20 years (Angrave et al., 2016; Cappelli, 2017; Davenport et al., 2010; Huselid, 2018; Marler & Fisher, 2013), scholarship shows it has been particularly slow in delivering on its promises (Ellmer & Reichel, 2021; Minbaeva, 2018). A review of current literature reveals that because HR Analytics in practice is a relatively recent HRM innovation (Marler & Boudreau, 2017), the added value it can bring to the heart of HR, from its very strategic position and contribution through to its operational deliverables across the organisation is, for the most part, still unclear (Angrave et al., 2016; Huselid, 2018; Marler & Boudreau, 2017). We view HR Analytics as the practice of data-driven HR decision-making. This practice involves addressing a strategic or operational HR concern by making use of data (HR, business and/or external data) and encompasses the following process: identification of a business problem, research design for the specific HR issue under scrutiny, data management, data analysis, data interpretation and communication, a subsequent action plan and evaluation. If this process is relatively straightforward, the compelling question is: why is the potential of HR Analytics slow in being realised? One of the reasons could well be a failure to deliver added value. However, its lack of social recognition, support and buy-in, particularly by HR Leaders (Angrave et al., 2016; Huselid, 2018; Minbaeva, 2018), reveals that issues of legitimacy may be at play.

Practitioners notes

What is currently known about the subject matter?

- Despite the potential strategic contribution of human resources (HR) Analytics, it is yet to be fully leveraged by many HR Functions and organisations.
- Recent work on HR Analytics has called for a deeper understanding of the legitimisation process of HR Analytics within the HR function and the organisation more broadly.

What does your paper add to this?

- This is the first study to examine the legitimacy of HR Analytics.
- This longitudinal study undertakes a highly detailed examination of HR Analytics legitimacy in organisations using process theory to map the critical decisions, activities and events an organisation engages in which, can delay, enable, or accelerate the legitimacy process.
- We identify three core sub-processes where organisations that can accelerate the legitimacy of HR Analytics are identified (i) HR Analytics as a strategic commitment, (ii) the HR data infrastructure decisions and (iii) the focus of HR Analytics projects.

What are the implications of the study findings for practitioners?

- Our findings will help HR Analytics professionals and HR practitioners develop their organisational and professional legitimacy.
- Practitioners can examine their current practices and processes in the light of the three subprocesses and their corresponding institutional activity. In doing so, they can identify those activities that are delaying their legitimisation process and those they can engage with in order to enable or accelerate their HR Analytics legitimacy.

Legitimacy, generally understood as the level of social acceptance of a phenomenon, has been one of the main components of institutional theory for decades (Schuman, 1995), and it has previously been applied to the study of the adoption of numerous HRM practices and processes (Lewis et al., 2019). There has been a steady and ongoing line of research in HRM scholarship pertaining to the legitimacy of human resource management as a function as well as a profession (Brandl & Pohler, 2010; Farndale & Brewster, 2005; Legge, 1978, 2005; Pohler & Willness, 2014). Stakeholders' perception of human resource management legitimacy has been historically dissatisfying as the HR Function and profession are often portrayed in supporting roles only. More recently, scholars have focused on explaining how certain new HRM practices become legitimate in the eyes of both stakeholders and the broader internal organisational context [e.g., disability-inclusive HR practices in Moore et al. (2017)] and indeed, how HR professionals can successfully seek and gain legitimacy within the business (e.g., Heizmann & Fox, 2019).

Given how recent contributions describe the complexity surrounding HR Analytics, it seems plausible to argue that its legitimacy constitutes a unique case in terms of its gaining process, more so within the broader picture of overall struggling HR legitimacy. Firstly, research to date has failed to demonstrate measurable HR contributions to organisational performance, both in terms of strategic and operational performance (Legge, 1978, 2005). This state of performance-limbo is exacerbated when, despite a growing body of HR Analytics literature, the gap persists. This is likely due to challenges defining the 'epistemic object' of HR Analytics, whose key performance indicators (KPIs) are more complex than in other business domains such as finance, operations or marketing (Ellmer & Reichel, 2021; Greasley & Thomas, 2020). Secondly, HR Analytics is a HRM innovation that involves multiple stakeholders, a challenge that is intensified by the fact that many of these are non-HRM experts (Boudreau & Cascio, 2017; Minbaeva, 2018). There is also an added complexity in that HR Analytics projects consist of a multi-staged process, each stage carried out by different professionals with different skillsets and expertise (Boudreau & Cascio, 2017). Finally, given HR Analytics' positioning within a traditionally under resourced function such as HR, there appears to be limited financial opportunity to invest in the required HR technology and data infrastructure (Angrave et al., 2016; Huselid, 2018; Minbaeva, 2018).

These challenges make HR Analytics a unique case of HRM innovation adoption, a critical process that is in nature more elaborate than existing HRM processes (i.e., selection, onboarding, training, etc.), specifically because of its multi-staged, multi-non-HRM actors and multi-infrastructure nature (Minbaeva, 2018). Most HRM studies exploring the legitimacy of the HR function, HR profession or HRM practices have used the concept of social legitimacy (Pohler & Willness, 2014). However, the complex process of HR Analytics legitimacy is multidimensional, involving different skillsets, methodologies, actors and infrastructure. Hence, we argue HR Analytics legitimacy is best positioned within the entrepreneurial legitimacy process as it includes the development of cognitive, socio-political and technological legitimacy by entrepreneurial actors interconnected with a wide array of stakeholders (Aldrich & Fiol, 1994). Furthermore, how HR actors conduct themselves in relation to others as they strive for legitimacy becomes crucial. For this reason, we also draw on institutional work theory (Hampel et al., 2017; Lawrence & Suddaby, 2006) in order to explore how HR Analytics actors drive and influence the legitimacy process.

For the purposes of advancement therefore, our two research questions are as follows:

- (i) How does the HR Analytics legitimacy process present and develop in organisations?
- (ii) What decisions, activities and events can delay, enable or accelerate the legitimacy process of HR Analytics in organisations?

Given the reported shallow methodological approaches in the study of HR analytics, we have opted for a grounded theory approach through an interesting, granular lens, namely, process theory (Langley, 1999). Process theory, particularly via visual mapping, allow us take a deep dive into the complexity of HR Analytics and its legitimacy in a systematic way; identifying the decisions, activities and events that shape the process of legitimation over time. We draw from semi-structured interviews with HR Analytics professionals in three large, Irish-owned organisations – one

domestic and two multinational. These organisations were selected on the basis of their HR Analytics function's size and scope. Interviews with key stakeholders were carried out in three rounds between October 2017 and November 2020 to examine the evolution of HR Analytics over a period of 3 years, including the impact of Covid-19 pandemic.

2 | HR ANALYTICS, INSTITUTIONAL LEGITIMACY AND INSTITUTIONAL WORK

Within institutional theory, legitimacy is defined as the extent to which activities and behaviours are viewed by institutional actors as desirable, appropriate and acceptable within a specific context and under a common set of socially constructed norms (DiMaggio & Powell, 1983; Schuman, 1995). Institutional theory in industry creation scholarship provides interesting insights into the multifaceted nature of legitimacy at play within a new organisational space, namely, encompassing cognitive legitimacy (available knowledge and subject matter expertise in a space), socio-political legitimacy (collective acceptance of a new product or practice by multiple stakeholders) and technological legitimacy (available technology and processes to achieve specific aims) (Aldrich & Fiol, 1994).

In this context of HR Analytics, *cognitive legitimacy* refers broadly to what we understand by HR Analytics and what it can do for HR and the organisation. While HR Analytics experts are reaching common ground as to what it is (Boudreau & Cascio, 2017; Minbaeva, 2018), the context for HR Analytics, that is the HR function, still has its critical contribution to the business challenged (Huselid, 2018). Many HR functions remain somehow self-contained and focus on HR data as a measure of functional activity and a means of generating a range of employee status reports (Minbaeva, 2018). For HR Analytics to be fully realised, a common challenge is that of resolving strategic business problems by understanding and applying data science techniques, it typically requires a vast number of data points to be sourced, then interrogated from different legacy IT systems, including Human Resource Information Systems (HRIS) or Human Capital Management (HCM) systems and more often than not, thoroughly cleaned before and after merging the data into a single database. The skills required to manage this HR Analytics process from end to end do not typically fall inside the traditional HR skillset and capability (Berk et al., 2019; Bohlouli et al., 2017; Simón & Ferreira, 2018). Besides the complex cognitive elements involved in HR Analytics, we must also consider how organisations understand their level of legitimacy of any particular practice. Aldrich and Fiol (1994, p. 648) note that 'from a consumer point of view, cognitive legitimation means that people are knowledgeable users of the product or service'. HR Analytics is not largely situated within a high level of cognitive legitimation when it comes to user engagement levels, that is, the HR function and the broader business (Minbaeva, 2018). The reason behind such low levels of HR Analytics engagement is that human resource management as a discipline has not been particularly data literate historically. Thus, both HR practitioners and academics, with some exceptions, have not developed an analytics skillset (Angrave et al., 2016; Edwards & Edwards, 2019; Kryscynski et al., 2018). This is exactly where the institutional work lens can provide some ideas around how HR Analytics actors transmit and develop what they do through what has traditionally been termed 'symbolic work', in other words, through creating their own professional identity, the added value they contribute, and their own potential (Hampel et al., 2017; Lawrence & Suddaby, 2006). Given that the organisational location and reporting line of those working in HR Analytics can vary (Boudreau & Cascio, 2017), we will often refer to HR Analytics professionals as such when explaining actors' institutional work and as a whole ('HR Analytics function') when referring to the specific function, purpose and legitimation process. HR Analytics functions usually include a Lead – who manages and oversees the HR Analytics function – and one or more HR Data Administrators, developers and HR Analysts whereas HR Analytics stakeholders may include senior leadership, HR leadership, HR data users and non-HR data users. We argue, therefore, that within the HR Analytics Process, HR Analytics professionals will create, maintain and deploy joint symbolic terminology, narratives, and methodologies in order to make sense of what they do from a business and HR perspective, precisely to overcome both their challenging position and certain power imbalances they may find within the HR or business intelligence functions (Angrave et al., 2016; Minbaeva, 2018; Zietsma & Lawrence, 2010).

Socio-political legitimacy is another dimension contributing to the overall legitimacy of HR Analytics. It refers to the collective acceptance of a new practice by multiple stakeholders, ultimately including the general public and key opinion leaders within a particular institutional context (Aldrich & Fiol, 1994). The legitimisation of new practices are not just patterns of constructed and established meaning (cognitive legitimacy) but also a socio-political space where the negotiations and renegotiations of meaning occur. Hence, we argue that an effective HR Analytics process mirrors those characteristics needed in entrepreneurial behaviour or innovation adoption (Marler & Boudreau, 2017; Vargas et al., 2018). As Dees and Starr (1992) put it 'entrepreneurs must engineer consent, using powers of persuasion and influence to overcome the scepticism and resistance of guardians of the status quo'. It is those engaged at the coalface of HR Analytics that might need to build this cognitive legitimacy for other key stakeholders such as HR Leaders, Practitioners and C-suite Leaders, who consciously or unconsciously demand the provision of a quantifiable added value from HR Analytics (Hargaden & Ryan, 2015; Minbaeva, 2018; Simón & Ferreiro, 2018). However, research to date has given us a different picture than expected. As Boudreau and Cascio (2017, p. 120) note: 'we all encounter frequent stories from HR colleagues, often working in companies known for enlightened and informed HR practices, who report presenting their leaders with such evidence, only to be congratulated on making HR more "analytical", and then to see the results ignored'.

Given the potential lack of internal, solid socio-political legitimacy or credibility of HR Analytics (Minbaeva, 2018), institutional work lenses point us towards the so-called 'relational work', that is, those interactions sought in order to make their work relatable and translatable to business concerns and priorities, and thus, advance its socio-political legitimacy (Aldrich & Fiol, 1994; Hampel et al., 2017). For HR Analytics professionals to advance their own institutional ends, relational work would need to be undertaken at different levels. First, a relationship with the business can be established when HR Analytics serves business needs and priorities more directly (Boudreau & Cascio, 2017). Second, relational work with HR practitioners in the form of developing supports and a steady rapport can also be fostered with HR leaders and business partners (HRBPs) (Angrave et al., 2016).

Finally, *technological legitimacy* is the last dimension to consider when studying HR Analytics legitimacy. The adoption of new technologies is a painfully slow process in many disciplines, primarily due to cost but also legacy mind-sets, it is no different in human resource management (Marler & Fisher, 2013; Strohmeier, 2009). Technological legitimacy, also termed 'sociotechnical regimes', refer to the semi-coherent set of technical practices shared by different social groups in organisations. Hence, technological legitimacy relies on the interconnection of a diverse range of actors and their joint use of the same technological tools (Geels & Schot, 2007). Through institutional work lenses, technological infrastructure is part of the focus of 'material work', that is, the adoption of physical elements, tools and objects that are deployed to carry out work (Hampel et al., 2017; Lawrence & Suddaby, 2006). The still limited scholarship in HR Analytics notes that this domain requires significant and sustained investment in new technology and data infrastructure to be realised (Boudreau & Cascio, 2017). Yet, many organisations report shortcomings on the data infrastructure front (Angrave et al., 2016; Huselid, 2018; Minbaeva, 2018). In this vein, Minbaeva (2018, p. 3) notes that 'this creates a kind of "catch 22": the team responsible for Human Capital Analytics (HCA) needs data to prove its point, but top management needs proof before it will invest in HCA'. This prevailing lack of technology adoption and integration is related to the challenge of securing financial investment in infrastructure (Angrave et al., 2016; Minbaeva, 2018) and the legacy of multiple, dispersed HR data repositories, many manually collected and stored across different vendor platforms (Luo et al., 2018). However, there is growing evidence that organisations are increasingly focusing on adopting data warehouses and infrastructures (e.g., data lakes or consolidated data repositories) that will address this infrastructure issue, in addition to developing data governance programs to ensure legal compliance and ethical management of that data (Angrave et al., 2016; Bohlouli et al., 2017).

Finally, legitimacy is by its very definition contextualised: it occurs within and is shaped by a particular context. Relevant literature has also pointed out that industries whose business models are data-driven are more likely to engage with the HR Analytics process for several reasons: (i) these businesses appreciate the added value of data-led

decision making; (ii) data expertise and skills already exist in the organisation and (iii) they are more technology and data infrastructure ready than other industries (Aral et al., 2012; Boudreau & Cascio, 2017). Finally, research on HR Analytics has shown a certain degree of dynamism and complementarity between the different elements in the HR Analytics process (practices, skills and systems) (Aral et al., 2012). We expect to find some variations across levels of legitimacy and differences in the way each legitimacy dimension can influence other dimensions.

3 | METHODOLOGY

Against this theoretical backdrop, a qualitative methodology is viewed as a more appropriate vehicle to understand the 'how' and 'why' of a particular phenomenon (Eisenhardt, 1989; Yin, 2014), and in this vein, it is the appropriate methodology to uncover how the HR Analytics legitimacy process unfolds over time. We employ a longitudinal research design with three data collection phases taking place between October 2017 and November 2020. Industry and organisation analysis was undertaken through documentary analysis. We set out to carry out our fieldwork by interviewing HR Analytics professionals in 20 organisations. Upon this initial round of pre-fieldwork interviews, and given the embryonic stage of their HR Analytics functions we progressed to select cases where we could (i) review their trajectories over the course of 3 years; (ii) interview at least four HR Analytics stakeholders to ensure internal validity and (iii) observe some substantial evolution in their legitimation. The rationale for selecting Irish organisations was the following: (i) to observe the legitimation trajectory of their HR Analytics process from their head office, where the locus of decision-making is placed, across a diverse range of reporting structures, projects, team compositions and levels of maturity and growth and (ii) a preference for non-US organisations was prioritised since US firms are both IT and HR pioneers (Bloom et al., 2012) and already the focus of many HR studies (Collinson & Rugman, 2010). Additionally, it is worth mentioning that two large US multinationals in the IT sector were originally interviewed. One did not have a HR Analytics capability and were still implementing a single HRIS platform across the organisation. The second one was not willing to share further information with third parties, due to recent backlashes in the international media. This experience further underpinned our intention to focus on Irish organisations. The three selected organisations, although operating in the different industries of telecommunications, retail and banking, all share an important customer-facing retail section, thereby having a history of engagement with customer analytics. Both the variety of respondents and the longitudinal nature of the study were geared towards the identification of cause-effect relationships (Leonard-Barton, 1990). Upon this preliminary fieldwork therefore, we sought to identify Irish-owned organisations already actively engaging in HR Analytics across the business. Initially, individuals working in the HR Analytics space were approached directly, either through personal contacts or specifically targeted via LinkedIn. This group was then narrowed down to those that identified themselves as engaging in HR Analytics. The company characteristics of the three final cases selected in line with the above criteria are outlined in Table 1.

Alpha is a fixed, mobile and broadband provider. Although Alpha serves Northern Ireland and is growing in Great Britain, its international operations are still small compared to other established multinationals within the same sector. As shown in Table 1, Alpha employs approximately 3400 people covering these territories. Delta is one of the traditional Big Four commercial banks in Ireland, founded over half a century ago and with branches all over the country. Delta is predominantly owned by the Irish government (over 70% of the capital) and underwent a major reform in 2009 after the global financial crisis, accepting several billion-euro bailouts from the government of the Republic of

TABLE 1 Company characteristics

Pseudonym	Nationality	Industry	Size	MNC	Org age	Interviews	Respondents
Alpha	IE	Telecoms	>3400	Yes	35	8	8
Delta	IE	Banking and finance	>10,000	No	53	8	6
Gamma	IE	Retail	>65,000	Yes	50	6	4

Ireland. Gamma is a British-owned fashion retailer headquartered in Ireland. Operating in 11 jurisdictions outside Ireland, Gamma owns over 370 stores across Europe and the United States. They employ over 65,000 people worldwide.

The first round of interviews within these organisations was undertaken between October 2017 and July 2018. Four Data Analytics professionals, working specifically on HR Analytics, shared their experiences of, and approach to, the development of a HR Analytics functions within their organisations through semi-structured interviews ranging from 45 min to 1 h 40 min in duration. Challenges engaging HR Analytics professionals emerged in this first round of interviews due to the nascent nature of their jobs. It was common to approach potential interviewees in these companies and be told to wait a few months until they figured out what exactly their roles and responsibilities were! Table 2 gathers their current positions and professional backgrounds along with HR Analytics projects undertaken. Within the first round of interviews we had the opportunity to talk to the Director of the Analytics Centre of Excellence in Alpha, the HR Reporting and Data Analytics Lead in Delta and the Director of Central Systems and Business Intelligence, and the HR Reporting and Analytics Lead in Gamma.

Although challenges collecting data were apparent, we were aware of the need to expand both the depth of information gathered and the diversification of sources and perspectives. We set out to undertake a second round of interviews with the aim of reviewing changes over time in terms of both scope of HR Analytics capability and its HR and business impact. We endeavoured to identify other stakeholders involved in this legitimacy trajectory. Therefore, between September 2018 and December 2019 we sought to clarify some aspects of initial findings with two of the original participants, while also expanding data collection on the HR Analytics legitimation process into the HR Function domain through the addition of five new participants working specifically in HR roles such as HR leaders or business partners. These details are outlined in Table 2. It is also worth noting that by the time we finished the fieldwork, very few HR professionals in these three organisations were effectively leveraging the HR Analytics outcomes the HR Analytics functions had delivered. We also aimed to interview the Directors of Business Intelligence or Data Analytics within the three organisations. This multi-level design was intended to verify and cross-check the information collected from HR Analytics professionals. We gained access to these Directors in Alpha and Gamma, unfortunately not in Delta. A similar pattern occurred when we attempted to interview HR professionals using HR Analytics outcomes. We interviewed the Director of HR Shared Services in Alpha and a HR Business Partner in Delta. Gamma reported that neither counterparts were really involved in any way in the HR Analytics Process or in changes brought about as a result of HR Analytics insights.

In order to undertake data triangulation to ensure internal validity, we attempted to engage in a further round of interviews with HR and non-HR users of HR Analytics. This third phase took place during the Covid-19 pandemic, starting in August 2020 and finishing in November 2020. Two of the organisations were happy to provide time and share their experiences. Alpha provided four Managing Directors of business units who were willing to talk openly about their own views of HR Analytics in their organisations, namely Customer Services, Networks, Corporate Products and Consumer Products. Delta was also willing to cooperate with a wider range of HR and non-HR users, including the Head of Data Ethics, the Head of Performance Management and Organisational Effectiveness, a Digitalisation and Transformation Manager, an Agile Lead, and a Senior HR Analyst. However, a more challenging route to accessing a third round of interviews took place in relation to Gamma. The Irish retailer had taken a different turn of events since Covid-19 hit and a substantial restructure of stores was underway. By then, the HR Analytics function had moved into the business and was focused on a considerable series of store closures in the Republic of Ireland and the UK. At this critical time, when hundreds of jobs were at stake, the organisation did not wish to continue with data collection with the sole exception of the Senior HR Analyst and Administrator, who kindly agreed to provide an overview of the final stage of their process trajectory.

TABLE 2 Participant information by fieldwork phases and case studies

Pseudonym	Fieldwork phase	Participants	Professional background	HR Analytics focal points
Alpha	October 2017 to July 2018	Director, Analytics Centre of Excellence	Marketing, Computer Information Systems, Analytics, Organisational Effectiveness	Digitalisation Employee IT adoption Employee exiting incentives choices
		Director of Analytics (New Participant)	IT Management, Data Science	Fragmentation of HR systems, integration of HR data Improving HR data quality Reporting on online training Gender project
	August 2020 to November 2020	Director of HR Shared Services (New Participant)	Management Applications, Computer Information Systems, Governance	Productivity and performance metrics Decentralisation of the BI/Data Analytics function Managing own small MIS team HRBPs role
		Managing Director Corporate Products	IT and Marketing	Productivity and performance metrics Decentralisation of the BI/Data Analytics function HR support
		Managing Director Consumer Products	Business Studies	Productivity and performance metrics Decentralisation of the BI/Data Analytics function HR support
		Managing Director Networks	Applied Physics, MIS	Productivity and performance metrics Decentralisation of the BI/Data Analytics function Role of HR Analytics in their dealings with trade unions representatives
		Managing Director Customer Service	Business Studies	Productivity and performance metrics in call centres Decentralisation of the BI/Data Analytics function HR support to the business unit

TABLE 2 (Continued)

Pseudonym	Fieldwork phase	Participants	Professional background	HR Analytics focal points
Delta	October 2017 to July 2018	HR Reporting and Data Analytics Lead	Physicist, Data Analytics	Reporting, Self-reporting, Dashboards Employee retention
	September 2018 to December 2019	HR Reporting and Data Analytics Lead (Same Participant)	Physicist, Data Analytics	Attrition, scorecards for HR Workforce scenario planning for strategic change
		HR Business Partner (New Participant)		Improvement of dashboards
	August 2020 to November 2020	Head of Data Ethics	Physicist, Data Analytics	Moving the HR Analytics function from HR to the BI/Data Analytics Function Development of data ethics framework
		Head of Performance Management & Org Effectiveness	Energy Management, International Business,	Use of HR Analytics insights Dashboards and metrics development Working with the HR Analytics function Digitalisation and operational effectiveness and the role of HR Use of analytical insights in transformation
		Digitalisation and Transformation Manager	Business Studies, Project Management, Product Management	Role of HRBPs in transformation
		Agile Lead	Software engineer, MBA, Executive coaching	Agile transformation of software development Use of metrics in transformation and more broadly, in managing engineering teams Use of metrics in daily performance management through coaching
		Senior HR Analyst and Developer	Information Systems and Information Technology	Data integration HR Analytics projects related to Covid-19 Moving the HR Analytics function from HR to the BI/Data Analytics Function

(Continues)

TABLE 2 (Continued)

Pseudonym	Fieldwork phase	Participants	Professional background	HR Analytics focal points
Gamma	October 2017 to July 2018	HR Reporting and Analytics Lead	Mathematician, Data Analytics	Employee turnover
		Central Systems and Business Intelligence	Computer systems, Enterprise IT Architecture	Employee retention Organisational effectiveness Company-wide headcount reporting
	September 2018 to December 2019	HR Reporting and Analytics Lead (Same Participant)	Mathematician, Data Analytics	Self-reporting
		HR Data Administrator (New Participant)	Physics & Maths, IT systems	HRIS final implementation in all jurisdictions
	August 2020 to November 2020	HR Data Analyst (New Participant)	Tourism, Higher Diploma in Data Analytics	Integration of data
		Senior HR Data Administrator and Analyst	Information Systems	Data integration HR Analytics projects related to Covid-19 restructuring Low-cost business strategy Moving the HR Analytics function from HR to the BI/Data Analytics Function

Abbreviations: BI, business intelligence; HR, human resources; HRBP, Human Resource Business Partner; HRIS, Human Resource Information System; MIS, management information systems.

3.1 | Methods to identify the legitimacy process timelines

Our strategy for making sense of HR Analytics Process data is a visual mapping strategy, more specifically, we use flow-charts to represent the HR legitimacy process in our three chosen organisations. As Langley (1999; p. 700) notes 'visual graphical representations are particularly attractive for the analysis of process data because they allow the simultaneous representation of a large number of dimensions, and they can easily be used to show precedence, parallel processes and the passage of time'. Figures 1–3 display flow-charts for Alpha, Delta and Gamma. The three timelines run from 2016 to 2020, opening up a series of external and internal events (represented by an oval and diamond respectively), decisions (represented by a stadium) and activities (represented by a rectangle). Given the richness of the data set, this way of organising and making sense of our data was a required intermediary stage designed to progress from our raw data closer to the theoretical implications drawn from it, the latter is presented in the findings section (for an earlier, more extensive classification of raw decision, activities and events data across the case studies see Table A1 in Appendix A). The three final flow-charts have allowed us identify shared patterns and sequences of events, decisions, and activities shaping the HR Analytics legitimacy process. Additionally, we also proceeded to undertake our interview coding as a supplementary measure (Miles & Huberman, 1994), which both authors compared and contrasted until final agreement was reached. The coding supplemented and validated the three plotted flow-charts (a sample of our coding is included in Table B1 of Appendix B). Flow-charts have been noted as useful tools to combine grounded theory throughout a chronological, granular process, allowing for some quantification of process components. Thus, this method of qualitative analysis entails moderate levels of accuracy, simplicity and generalisation (Langley, 1999).

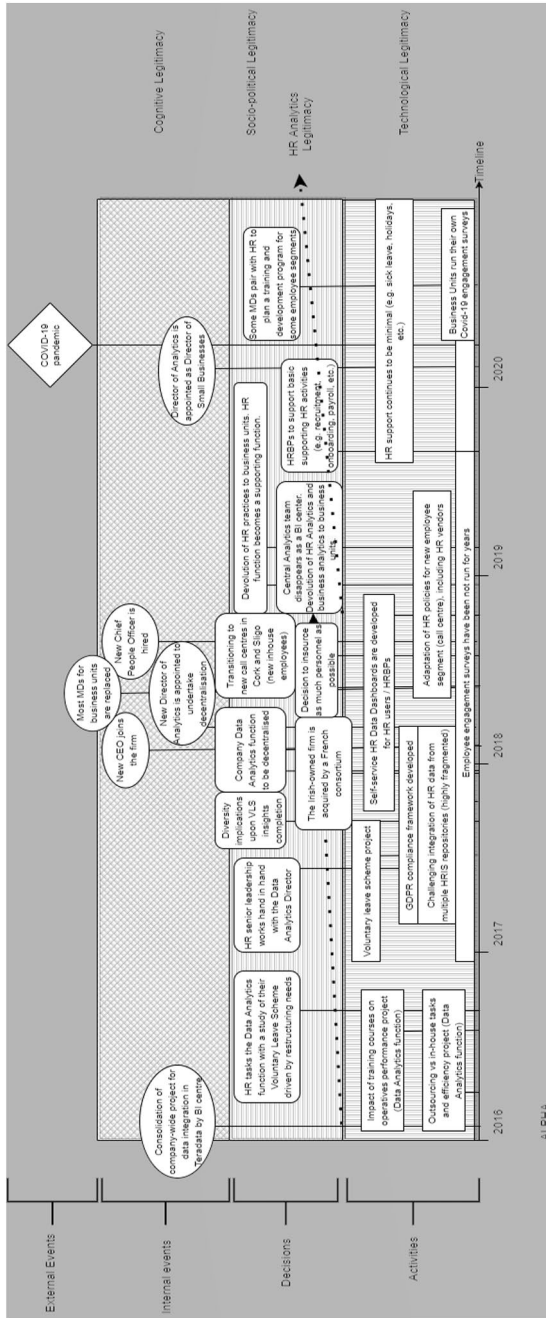


FIGURE 1 Human resources (HR) Analytics legitimacy process flow-chart for Alpha

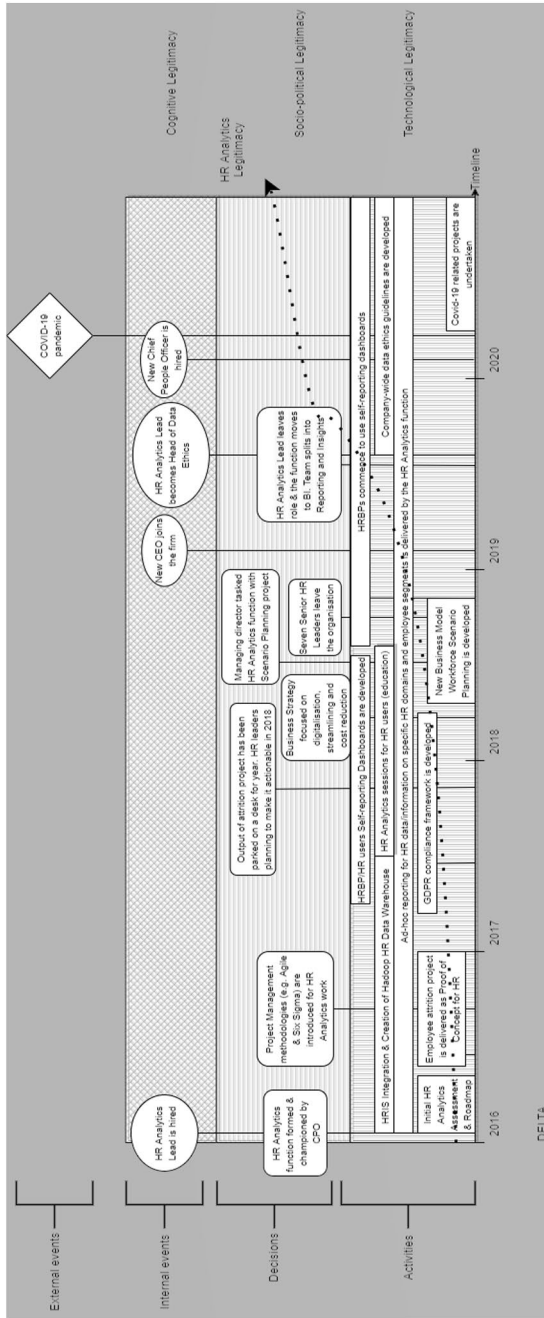


FIGURE 2 Human resources (HR) Analytics legitimacy process flow-chart for Delta

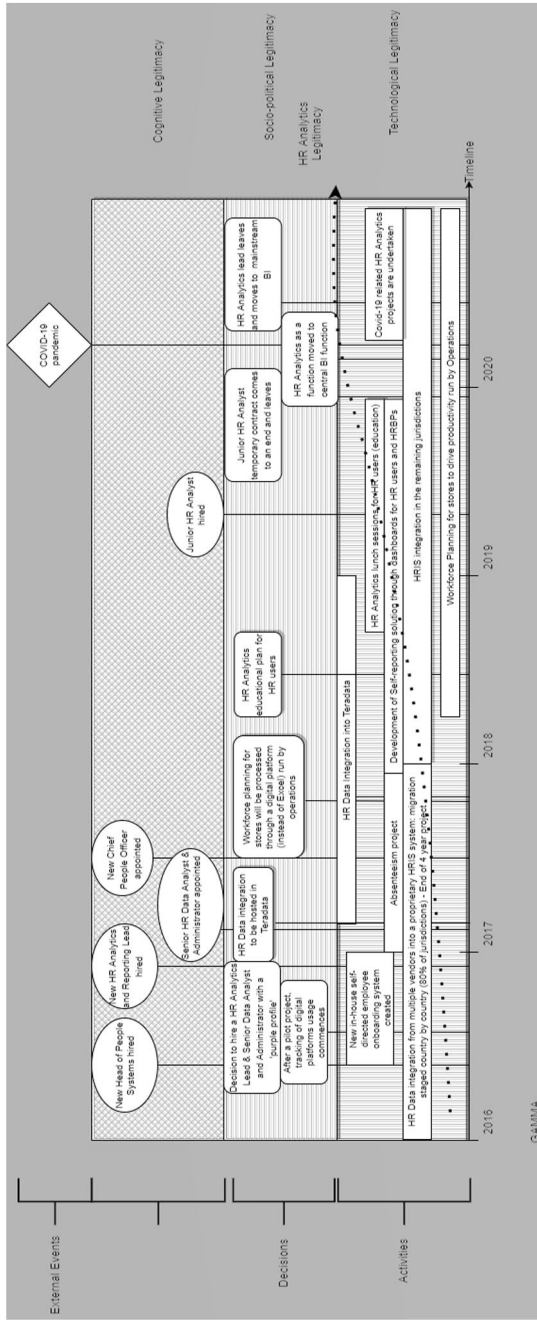


FIGURE 3 Human resources (HR) Analytics legitimacy process flow-chart for Gamma

Even though the three case studies operate in different industries and present clear differences in their HR Analytics legitimacy trajectory, Figures 1–3 show a relatively slow growth in HR Analytics legitimacy over the course of 3 years, represented by the dotted line. Before engaging in a more advanced, parsimonious theorising, even a cursory glance of the flow charts show evidence of the need for a well-integrated and solid technological infrastructure before a decisive turning point in the HR analytics trajectory takes place.

3.2 | Findings: Process data from the three case studies

In order to plot the data pertaining to the legitimacy process of the three organisations under study, we use flow-charts to portray our findings over a timeline. Like other scholars deploying a process analytical lens (Langley, 1999; Langley & Truax, 1994), we found them extremely helpful in organising and analysing information, facilitating a deep and highly nuanced investigation into the multifaceted nature of HR Analytics process legitimacy, helping us identify those decisions, activities and events that delay, enable, or accelerate the legitimacy process. Delaying elements (-) encapsulate those events, decisions and activities that slowed down the HR Analytics legitimacy process. Enabling elements (+) constitute those facilitating the development of HR Analytics legitimacy over time in a steady-going manner. Finally, accelerating elements (++) refer to those events, decisions and activities that propel HR Analytics legitimacy to the next level, by placing the HR Analytics function in an organisational situation from where it can contribute some added value to the business strategy. Langley and Truax (1994, p. 625) point out how flow-charts also allow for an 'intermediate level of theorising between the raw data and a more abstract and general process model'. This intermediate level of theory building refers to a set of sub-processes that is found to be common to the three case studies (Figure 4). These sub-processes are not linear and do not occur in an isolated manner but rather interact with one another, independently, yet influencing each other over time (Figure 5).

Three subprocesses are observed in the case studies where the potential to enable HR Analytics legitimacy is at stake. These processes offer a dichotomous possibility and often times, the same organisation moves from one possibility to another over time. The first subprocess is the adoption of HR Analytics as a strategic commitment. This *strategic commitment* can originate within the broader business or within the HR Function. We identified four delaying elements (-) within this subprocess; (i) siloed HR strategic sponsorship, (ii) changes in HR leadership and (iii) changes in C-suite leadership, and (iv) the location of the workforce planning capability outside HR. The institutional work associated with these delaying elements were (i) the absence of shared strategic goals with other parts of the organisations (symbolic and relational work delaying cognitive and socio-political legitimacy), (ii) relationship building between the HR Analytics function and the business taking over everything else in the function (relational work delaying socio-political legitimacy) and (iii) the disruption of work rhythms due to changes (relational work delaying socio-political legitimacy). Apart from what makes HR Analytics legitimacy slow down, we also mapped a series of enabling (+) and accelerating elements (++) with their corresponding institutional work activity. Enabling and accelerating elements for a stronger strategic commitment are as follows; (i) hiring a suitable HR Analytics lead and team formation (+), (ii) implementation of Project Management (PM) methodologies for HR Analytics Projects (+), (iii) design and delivery of HR analytics users educational programs (+), (iv) involving the BI/Data Analytics function in HR Analytics projects (+), (v) integration of HR data into companywide BI Data warehouse (++) and (vii) the transfer of the HR Analytics function into the BI/Data Analytics function (++)). There were certain institutional work activities associated with these enabling and accelerating elements. Among them, we observe (i) the creation of the HR Analytics function identity and capability (symbolic work enabling cognitive legitimacy) (ii) defining 'how we work' (e.g., Agile, Lean Six Sigma, etc.), (symbolic work enabling cognitive legitimacy), (iii) identifying added value to stakeholders (symbolic work enabling cognitive legitimacy), (iv) creating and maintaining collaboration (relational work enabling socio-political legitimacy), (v) disrupting the status quo (where we belong) and redefining the identity of the HR Analytics function as part of the broader BI/Data Analytics function (symbolic and relational work accelerating cognitive and socio-political legitimacy), (vi) creating greater data functionality (material work accelerating technological legitimacy) and (vii)

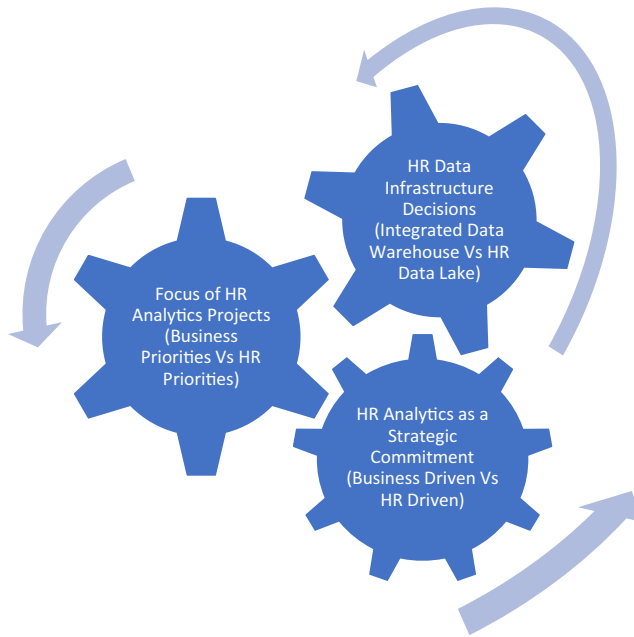


FIGURE 4 Human resources (HR) Analytics legitimacy subprocesses [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

amplifying HR technology functionality (material work accelerating technological legitimacy). In all three cases, we witness growing levels of legitimacy when the strategic commitment lies within the business. Alpha's strategic commitment has always resided within the business and this seems to have paid off in terms of legitimacy levels at least before embarking upon a HR and data decentralisation strategy. On the other hand, once Delta and Gamma decided to transfer the HR Analytics function into the Business Intelligence (BI)/Data Analytics Function, the scope and purpose of HR Analytics grew organically.

The second subprocess that is dichotomous in nature is the *HR data infrastructure decision*. On the one hand, HR data can be siloed and stored independently or alternatively, it can be part of a companywide data warehouse. There were primarily three delaying elements identified in relation to HR Data Infrastructure; (i) the existence of fragmented HRIS/HR proprietary systems, (ii) slow HRIS implementation in certain jurisdictions and (iii) the devolution of HR and business analytics to business units (decentralisation). The institutional work linked to these delaying elements was mainly a low degree of technological integration (material work delaying technological legitimacy) and the recalibration of the HR function identity and purpose (symbolic and relational work delaying cognitive and socio-political legitimacy). Among the enabling (+) and accelerating (++) elements, we find (i) the HRIS integration and creation of a HR data lake (+), (ii) a business strategy focused on digitalisation, streamlining and cost reduction (+), (iii) the development of HRBP/HR user self-reporting dashboards (+), (iv) the development of a GDPR compliance protocol framework (+), and (v) the transfer of the HR Analytics function to the BI/Data Analytics function (++) . Contributing institutional work activities correlated with these enabling and accelerating elements are (i) creating a greater technology functionality (material work accelerating technological legitimacy), (ii) generating efficiencies in functionality of business technology (material work accelerating technological legitimacy), (iii) developing data democratisation and accessibility (material work enabling technological legitimacy), and (iv) producing data ethics codes and technology compliant functionality (symbolic and material work enabling cognitive and technological legitimacy). Alpha originally started the HR Analytics function from the BI/Data Analytics Function but this was subsequently decentralised, with analytics devolved into the business units, including the HR Analytics professionals and HR data. These resources were viewed more as a tool for MDs and business managers to run their units than a tool for the HR Function. While HR data was deemed part and parcel of MD decision-making, in some cases it was reported as less advanced as it had been when

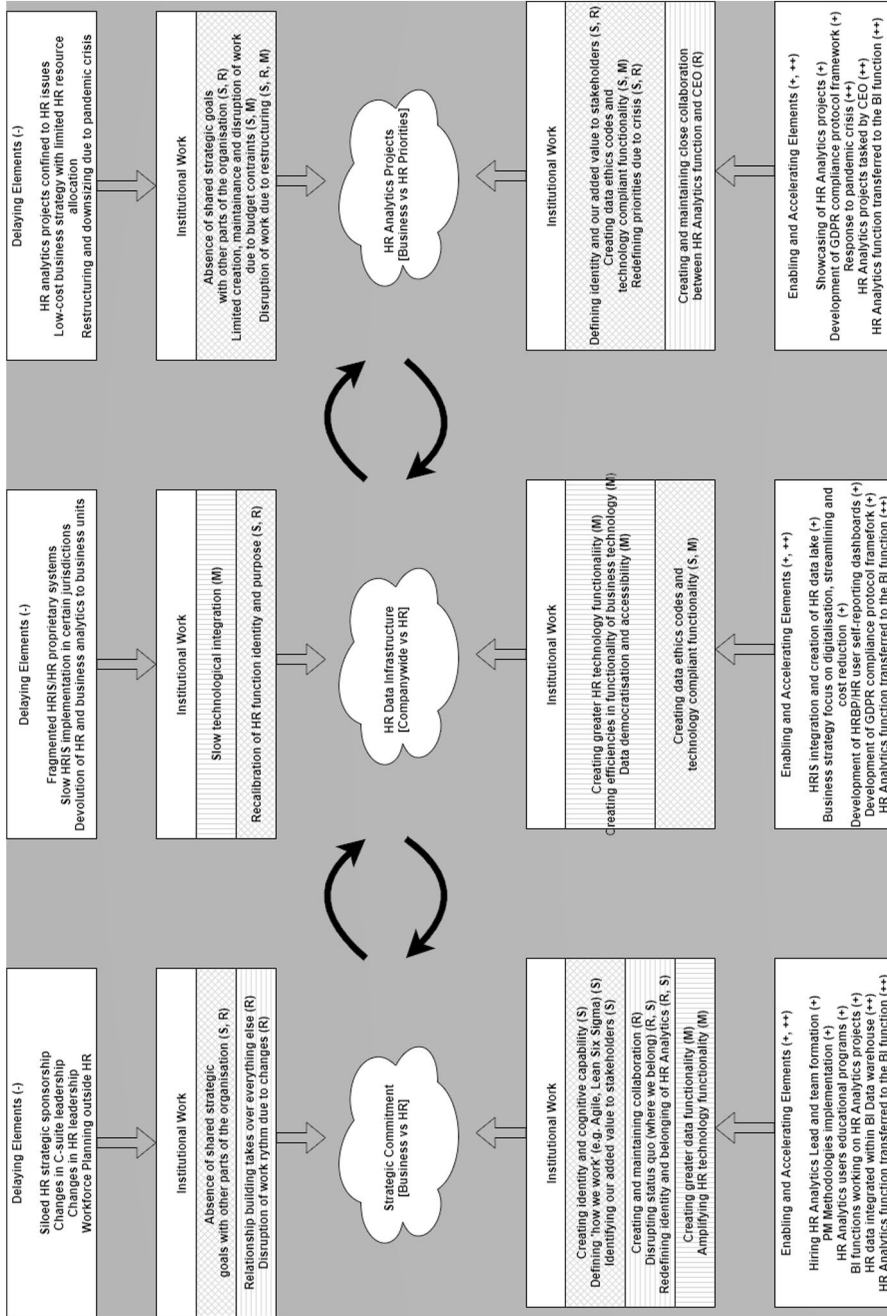


FIGURE 5 Human resources (HR) Analytics legitimacy subprocesses, institutional work and delaying, enabling and accelerating elements

stemming from the centralised BI/Data Function. Delta's case was different, where they built a HR data lake in Hadoop (java-based data storage), which was later incorporated into the business-wide data warehouse. Gamma's case is similar, although this incorporation only took place just before Covid-19. This study highlights that the merging of HR data into business data infrastructure makes it easier for the BI/Data Analytics Function to include HR data in business analytics projects, where this data maybe relevant. Moreover, from the point of view of adding value in relation to HR strategic contribution, access to business, operations and finance data is now achievable. Additionally, in all three cases we found that developing self-reporting dashboards to access HR metrics for HRBPs and other HR practitioners helps nurture a data-led mind-set in the organisation, particularly when these users are part of the dashboard design so that user experiences is maximised.

Finally, we see a third subprocess that depends on the previous two, the *focus of HR Analytics projects*. Again, we observe two extremes on the HR Analytics priority spectrum. Sometimes, HR Analytics projects prioritise a HR issue, triggered by HR leaders or practitioners (e.g., HRBPs). Other times, however, HR Analytics projects prioritise the CEO's or executive board's concerns and here the HR Analytics potential to add value to the business is substantially higher. We mapped a series of delaying elements related to the focus of HR Analytics Projects which were confined to HR issues; (i) a low-cost business strategy with limited HR resource allocation and (ii) the restructuring and downsizing response to the pandemic crisis. These delaying elements were brought about by specific institutional work activity, such as (i) the absence of shared strategic goals with other parts of the organisation (symbolic and relational work), (ii) limited creation, maintenance and disruption of work due to budget constraints (symbolic and material work delaying cognitive and technological legitimacy), and (iii) the disruption of work due to restructuring (symbolic, relational and material work delaying all types of legitimacy). There were also interesting enabling (+) and accelerating (++) elements, among them, (i) the showcasing of HR Analytics projects (+), (ii) the development of GDPR compliance protocol frameworks (+), (iii) the response to the pandemic crisis (++) , (iv) HR Analytics projects tasked by the CEO (++) and (v) the transfer of the HR Analytics function to the BI/Data Analytics Function (++) . This entailed certain institutional work activity encapsulating (i) the creation of identity and added value for stakeholders (symbolic and relational work enabling cognitive and socio-political legitimacy), (ii) the generation of data ethics codes and technology compliant functionality (symbolic and material work enabling cognitive and technological legitimacy), (iii) the redefinition of priorities due to crises (symbolic, relational and material work accelerating all types of legitimacy) and (iv) creating and maintaining collaboration between the HR Analytics function and the CEO (relational work accelerating socio-political legitimacy). By way of example, and in relation to HR analytics projects tasked by the CEO, in Alpha and Delta two workforce scenario planning projects were commissioned by business leaders. Alpha's workforce scenario planning, driven by the CEO and Customer Services MD, concentrated on the opening of three new call centres, which had been outsourced historically. Delta's workforce scenario planning, driven by the new CEO, of a potential transition of business model from traditional banking to online banking also triggered the move of the HR Analytics function from HR to the BI/Data Function. These examples become crucial to explain how HR Analytics legitimacy within the business can be accelerated by business mandates. This becomes particularly relevant since the Covid-19 pandemic, producing a business-driven appetite for insights in the domain of remote working, employee engagement and wellbeing in all three cases. Additionally, Delta engaged in HR Analytics projects tasked by the business on remote working and absenteeism and more importantly, on reduced office space and real estate needs apropos of a successful transition to remote working by a great majority of their workforce (Figure 5).

4 | DISCUSSION

One of the advantages of using a process theory lens is the granular analysis of complex phenomena by offering us a way to classify and systematise information (Langley, 1999). The compartmentalisation of decisions, activities and events has allowed us not only to identify three subprocesses, key to gaining a greater legitimacy level in the organ-

isation, but also to map specific institutional work activity engaged by actors which is shown to progress cognitive, socio-political and technological legitimacy (Aldrich & Fiol, 1994; Hampel et al., 2017; Lawrence & Suddaby, 2006). We now proceed to discuss these subprocesses and corresponding institutional work activity in context, with a view to highlighting some organisational and structural factors that potentially may also affect the HR Analytics legitimacy process.

In relation to the first subprocess, *strategic commitment*, we found a stark difference among the three cases. The HR Analytics strategic commitment in Alpha was primarily driven by the business. In Delta and Gamma, it was led by the HR leadership until the transfer of their HR Analytics functions to the BI/Data Analytics function, which occurred at clearly distinct times and for different reasons in each of these organisations. The idea of not housing the HR Analytics function within the HR Function but within the BI/Data Analytics Function is not new (Boudreau & Cascio, 2017). We are mindful of the limited scope for generalisation we enjoy given our three case studies, however, all three have a message regarding the home of the HR Analytics function and its impact on the added value that it provides. Alpha had always housed HR Analytics within the business and this had conferred the HR Analytics function with a more advanced socio-political legitimacy (Aldrich & Fiol, 1994; Hampel et al., 2017), which helped obtain resources for a substantially advanced integration of HR data into the companywide data warehouse. Alpha's legitimacy process was substantially faster at the beginning as this position allowed them to pursue institutional work activity from a symbolic, relational and material viewpoint (Lawrence & Suddaby, 2006) and hence, expanded all three dimensions of their HR Analytics legitimacy (Aldrich & Fiol, 1994). This was only disrupted by a business strategy of HR and data decentralisation, implemented at the end of 2018, where a devolution of power overall data (including HR data) was conferred to business units. What organisational and industry characteristics do we observe in Alpha's case? The telecom industry serves a very segmented market both in terms of product and services (fixed and mobile phone services, broadband, television and entertaining streaming, and infrastructure provision) and indeed a segmented customer base (individual consumers, small businesses, corporate customers and other telecoms-providers to whom they rent their infrastructure). These sector specific features mean that each business unit constitutes a differentiated function (Customer Service, Networks, Customer Products, Consumer Products, etc.) which in itself is a de facto data-driven business unit with its own data systems and Analytics Professionals. Therefore, we argue that organisations reflecting these industry features may also display a stronger HR Analytics strategic commitment driven by the business. Delta and Gamma reported a different strategic commitment, HR Analytics was solely led by HR. However, their institutional activity in this area demonstrates that by creating a common identity and cognitive capability, implementing work methodologies, clearly establishing the business added value creating and maintaining collaboration directly with the business, generating greater data functionality and amplifying HR technology functionality together steadily progressing strategic commitment in their legitimacy process. Coincidentally, in both organisations the HR analytics functions were eventually transferred to the BI/Data Analytics function. In Delta's case, the transfer took place in May 2019 and in Gamma's case in February 2020, both before the pandemic and both responding to a CEO's mandate towards a centralised data strategy. There was a crystal-clear rationale in both cases to pursue a centralised data strategy whereby data from finance, operations, customer service, workforce planning and HR could work in combination to generate insights for decision making. Previously, a tendency towards a siloed HR function and an absence of shared strategic objectives had delayed the need for a centralised strategy.

Within this subprocess, levels of HR Analytics cognitive and socio-political legitimacy seem to acquire a greater standing and potential strategic impact when HRA Professionals reside outside of the HR function and serve the business more directly. Firstly, the slow growth in socio-political legitimacy within the HR function can be exacerbated by the historical lack of data-led decision-making legacy found in many HR functions (Marler & Boudreau, 2017). This was certainly the experience of the HR Analytics Leads in Delta and Gamma, who found themselves in a home where few senior leaders could envisage their potential added value to HR and the business. Anecdotally, both individuals are no longer working in HR Analytics, perhaps due to the slow legitimisation process they experienced in HR Analytics. Secondly, the issue-selling abilities, relational dexterity and strategic business acumen (Conroy & Collings, 2016; Dutton & Ashford, 1993) of the HR Analytics lead can also procure a direct working relationship and process between

the HR Analytics function and the business without any intervention from the HR function. This was the case in Delta and Gamma, triggered as a result of managing urgent Covid-19 issues. Thirdly, the strategic positioning and legitimacy of the HR function in the overall organisation can play a part in enabling the socio-political legitimacy of HR Analytics. Our three cases highlight how a lack of strategic positioning of the HR function significantly delays the development of HR Analytics legitimacy. Finally, our cases also highlight whether a strategy of centralisation or decentralisation of the BI/Data Analytics function would impact HR Analytics legitimacy. From a socio-political and technological legitimacy viewpoint, it seems that a centralisation strategy is more fitting, enabling HR Analytics legitimacy. Nonetheless, the only case of decentralisation included in this study displayed high levels of data-led decision-making, including HR Analytics and insights, within most units and driven by business needs. It is worth noting, however, that some business leaders interviewed here felt that when they had the services of a centralised HR Analytics function, they used analytical solutions to not only resolve but in some cases identify business problems, which the business leaders themselves had not considered, ultimately questioning if indeed something important had been lost in the decentralisation strategy.

In terms of the second subprocess, *HR data infrastructure* decisions pertaining to technological legitimacy, we perceive a worrying difference between integrated data infrastructure and fragmented data infrastructure and the diverse range of functionality this offers to actors in the organisation (Angrave et al., 2016; Geels & Schot, 2007; Huselid, 2018; Minbaeva, 2018). Alpha showed interesting institutional work activities while pursuing a centralised data strategy and infrastructure, similar to that reported by Delta and Gamma once they had integrated their HR data within their companywide data ecosystem. Of these two, Gamma displayed greater fragmented HR systems, hence, limiting data integration. This aligns well with existing literature arguing that HR legacy and fragmented systems slows down the potential of HR Analytics (Marler & Fisher, 2013; Strohmeier, 2009). Again, we turn to context characteristics to try to explain these patterns. On the one hand, Alpha and Delta operate in the telecoms and banking sectors, both inherently data-driven business models. It is, therefore, logical to expect either higher levels of technological legitimacy or a greater facility to engage in material institutional work that will develop technological legitimacy considerably and at a good pace, as was the case at Delta. A second contextual factor we observe is the adoption of a business strategy focused on digitalisation, streamlining and cost reduction across the business. This occurred in Delta and, as a result, a greater interest on the part of the business for data centralisation emerged. For companies where this is not the case, what sort of material institutional work activity can be engaged to progress technological legitimacy (Lawrence & Suddaby, 2006)? Four types of material institutional activity were identified. First, creating a greater HR technology functionality with a proper integration of HR systems is fundamental. Second, generating efficiencies in functionality aligned with business technology strategies becomes crucial. Here, the strategic alignment both in objectives and technology architecture design between HR and the business seems to facilitate the integration of HR data into a company-wide data warehouse. Third, creating data democratisation and accessibility for HR and non-HR users, including primarily HRBPs and line managers. Finally, creating data ethics protocols encourages a compliant use of HR and business data.

We argue that a steady development of technological legitimacy, as we witness in Gamma, provides the HR Function and business with enough volume and variety of data (Minbaeva, 2018; Sheperd et al., 2018). However, this sort of nurturing will take time, typically a time span of 3 years. A slower route to HR Analytics legitimacy, through technological legitimacy, also offers some enabling elements worth discussing. Business-wide IS, data integration and a lack of effective self-reporting tools are all barriers in the HR Analytics legitimacy process. This challenge has been highlighted in prior studies (i.e., Huselid, 2018; Minbaeva, 2018) and there are many diverse and nuanced issues regarding the gathering, storing and mining of HR data in a central, business-wide repository. We know companies are still implementing business-wide HRIS for the first time, such as the case of Gamma, where not all jurisdictions are covered. Oftentimes, as in all three cases here, organisations have to migrate their data from multiple HR vendor platforms across a wide range of HR practices (e.g., Recruitment, Engagement Surveys, Performance Management Systems, Talent Management Systems, Payroll etc.) into a reduced set, integrated around a large HRIS (Angrave et al., 2016). However, let us not forget that the data challenge is not now, nor ever will be, unique to HR. In fact, respondents in our

three organisations recognise that there is still no big data in HR (Cappelli, 2017). On the other hand, the three cases showed evidence of how the design of self-reporting dashboards for HRBPs and HR leaders was key to a better definition of metrics (Minbaeva, 2018) and above all, crucial to fomenting a data-driven mind-set within the HR Function.

Finally, referring to the third sub-process identified in our study, namely, the *focus of HR analytics projects*, we also distinguish between those projects focused on HR issues and those tackling business problems. Again, Alpha showed greater legitimacy in all fronts prior to their data decentralisation strategy, whereas Delta and Gamma underwent a more developmental trajectory. Arguably this subprocess can become essential to gauge the extent of the impact HR Analytics has on the business, and therefore, it can also drive the other two subprocesses if a particular business strategic project has to be carried out. The appropriate question at this point is: what sort of institutional work activity can help shift the focus of HR Analytics projects? Creating identity and delivering some added value to the business becomes key. Once the business consumes HR Analytics insights in order to address business priorities, HR Analytics appears more likely to be tasked towards solving business problems through HR data. This was particularly the case in Delta, where the Head of HR Analytics created and maintained a steady collaboration with the CEO in order to offer some added value. Delta's HR Analytics socio-political legitimacy differed from Alpha's and yet, it manifests once again that socio-political legitimacy can significantly accelerate the role of HR Analytics within the organisation. In this case, the continual interaction and issue-selling abilities of the HR Analytics Lead in relation to the business, led to strategic engagement with business demands. The undertaking of workforce scenario planning for a new business model accelerated the legitimacy process, again, with a transplanting of the HR Analytics function from the HR Function to the BI/Data Analytics Function, and a greater integration of HR data infrastructure. A second contextual factor shifting the course of HR Analytics projects was of course the Covid-19 pandemic. Although its impact was different across sectors. For Alpha (Telecoms) and Delta (Banking), sectors that are data-driven and do not follow a low cost strategy, there was a rapid shift to address urgent business issues and this accelerated their HR Analytics legitimacy process. In Gamma, a non-essential retailer, the negative business consequences were imminent and drastic, as has happened in other sectors such as tourism or hospitality. The unfortunate need for business downsizing and restructuring became the HR Analytics focus.

5 | LIMITATIONS AND FUTURE RESEARCH

Methodological limitations were already mentioned earlier on, particularly, related to the accuracy and generalisation of process data and the limited number of case studies. We are mindful that our sample only comprises three Irish-based organisations, and that both institutional and cultural elements can indirectly shape the way these organisations are managed (Kostova et al., 2008). However, Ireland constitutes a strategic European multinational-dependent economy (Gunnigle et al., 2005), where American multinationals not only thrive but showcase their best practices, which are commonly adopted and mimicked by their Irish-owned counterparts (Geary & Roche, 2001; Lamare et al., 2013). Future research can focus primarily on HR Analytics legitimacy processes in organisations where HR is better recognised as a critical business contributor and enjoys a proactive role in driving business strategy. It would be revealing to explore whether the legitimacy of HR Analytics in these organisations develop at the same speed as in cases where HR Analytics sits outside the HR Function. We believe that HR Analytics can only be successfully adopted, developed and impactful in organisations where a strong HR legitimacy exists. Thus, it is incumbent on HR Leaders to actively develop this legitimacy among the key stakeholders; HRBPs and HR Analytics professionals in particular. Following on this point, we can speculate on the future of HR Analytics in HR altogether. Will HR take the opportunity to leverage HR Analytics to its own advantage, to finally uncover the links between certain HR practices and business operational performance (Purcell & Boxall, 2016), or will HR miss this train and see HR Analytics rebranded as a subset of general business analytics and relocated to other parts of the business?

Undoubtedly, novel research is needed to uncover HR Analytics legitimacy and impact in other sectors such as IT, professional services, consumer product manufacturing, pharma, aviation, construction, healthcare or the public

sector in order to shed light on sector-specific factors shaping the legitimacy of HR Analytics. There is also potential to map differentiated HR Analytics legitimacy processes across data-driven industries, which can render interesting findings regarding why some of these organisations do not make use of HR data. Finally, a future line of research that we see emerging from the data here, especially in our interviews with non-HR users, is a growing use of non-conventional HR data. Alpha's four managing directors and Delta's transformation and agile managers discussed the use of operational performance metrics on a daily basis. This people-related data, which we would not traditionally see as HR data, is provided by digital platforms and software vendors to account for performance indicators such as velocity, quantity and quality of products and project development. To what extent is this people-related data used and what impact does it have on HR practices; recruitment, employee performance, training and development plans, and disciplinary issues for example? Such use of people-related data without input from, or even the knowledge of, the HR function presents a threat to the very role of HR within organisations and should not be over-looked.

6 | CONCLUSION

The story of HR Analytics thus far has been dominated by a focus on the skills, capabilities and perceptions of HR Leaders and HR Professionals. Despite a growing body of evidence along these lines, and a clear acceptance of the strategic role of analytics in business today, we are still struggling to realise the potential of HR Analytics for the advancement of HR's strategic and critical business contribution. In this in-depth study, using a process theory methodology across three cases over a period of 3 years, we isolate and identify the broad range of decisions, activities and events which comprise the HR Analytics legitimacy process in organisations. The study reveals three related, non-linear sub-processes of HR Analytics legitimation, namely, HR Analytics as a strategic commitment, the HR data infrastructure decision, and the focus of HR Analytics projects. We further identify a number of delaying, enabling, and accelerating elements that influence this process. The findings offered here provide new and compelling insights into the future development of HR Analytics for theorists and practitioners.

ACKNOWLEDGEMENTS

We would like to thank all participants for their invaluable time and honesty. We would also like to thank Bernie Cramp from UCD for her support with copy-editing work. Grateful to Elaine Farndale and the anonymous reviewers who helped to further develop this manuscript in an enriching and constructive way.

Open access funding provided by IReL.

CONFLICT OF INTEREST

None.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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How to cite this article: Belizón, M. J., & Kieran, S. (2022). Human resources analytics: A legitimacy process. *Human Resource Management Journal*, 32(3), 603–630. <https://doi.org/10.1111/1748-8583.12417>

APPENDIX A

TABLE A 1 Primary Decisions (D), Activities (A) and Events (E) which Enable (+), Accelerate (++) or Delay (-), HR Analytics Cognitive (Cog), Technological (Tech) and Socio-Political (SP) Legitimacy

Strategic commitment (business-driven vs. HR-driven)	HR data infrastructure (enterprise data warehouse vs. HR data lake)	HR Analytics projects (business priorities vs. HR priorities)
ALPHA		
<ul style="list-style-type: none"> (-) Change of leadership (i.e., CEO, CPO, and MDs) with a focus on decentralisation of the BI/Data Analytics centre (E, D; Cog and SP). (+) BI/Data Analytics Function works closely with HR on HR Analytics projects (D; Cog & SP). (+) Transition to insource for cost reduction purposes (D; Cog). (++) HR Analytics created as an element of a companywide project for data integration in BI/Data Analytics centre (D, A; SP and Tech). 	<ul style="list-style-type: none"> (-) Devolution of HR and business analytics to business units, including data storage and warehousing (D, A; Tech & SP). (-) Challenging and slow HR data integration due to highly fragmented legacy systems (A; Tech). (+) Development of HRBP/HR users self-reporting dashboards (A; Tech, Cog & SP). (++) HR data is integrated into the companywide data warehouse via Teradata (D, A; Tech). 	<ul style="list-style-type: none"> (+) Project on Voluntary Leave Schemes tasked by the business (D, A; SP). (+) Development of GDPR compliance framework (A; Cog). (+) Business units run their own HR Analytics Covid-19 related projects, primarily engagement surveys (A; Cog). (++) Project on the impact of training courses on operatives' performance across the organisation. Tasked by business units (A; SP).
DELTA		
<ul style="list-style-type: none"> (-) Strategic commitment made from and within HR (D; Cog & SP). (-) Changes in HR Senior leadership (E; Cog & SP). (+) Head of HR Analytics hired and team formed (E, D; Cog). (+) PM methodologies introduced (D; Cog). (+) HR Analytics educational piece for HR users (A; Cog & SP). (++) HR Analytics function moved to the BI/Data Analytics Function (D; SP). 	<ul style="list-style-type: none"> (+) HRIS Integration and creation of HR data lake via Hadoop (D, A; Tech). (+) Business strategy to focus on digitalisation, streamlining and cost reduction (D; Tech & SP). (+) Development of HRBP/HR users self-reporting dashboards (A; Tech, Cog & SP). (++) HR data lake is incorporated into the enterprise data warehouse (D, A; Tech & SP) 	<ul style="list-style-type: none"> (-) HR Analytics projects confined to HR issues (A; SP). (+) HR Analytics Project on employee attrition (A; SP). (+) Development of GDPR compliance framework (A; Cog). (++) HR Analytics Project on workforce scenario planning tasked by CEO (D, A; SP). (++) HR Analytics Projects responding to Covid-19 related business demands (E, A; SP).
GAMMA		
<ul style="list-style-type: none"> (-) Strategic commitment made from and within HR (D; Cog & SP). (-) Workforce planning for stores processed through digital platforms by operations and separate from HR Analytics (D; SP). (+) HR Analytics Lead hired and team formed under the HR Systems leadership (E, D; Cog). (+) HR Analytics educational piece for HR users (A; Cog & SP). (++) HR Analytics function moved into the BI/Data Analytics Function in the organisation (D; SP). 	<ul style="list-style-type: none"> (-) Slow HRIS implementation in some jurisdictions such as Germany (A; Tech). (+) HRIS Integration and creation of HR data lake via Teradata (D, A; Tech). (+) Development of HRBP/HR users self-reporting dashboards (A; Tech, Cog & SP). (++) HR data lake is incorporated into the enterprise data warehouse once the HR Analytics function moved into the BI/Data Analytics Function (D, A; Tech & SP). 	<ul style="list-style-type: none"> (-) Due to low cost business strategy, a lack of appetite on HR Analytics projects is shown (D; Cog & SP). (+) Pilot project of digital platforms usage (D, A; Cog & Tech). (+) Project on Absenteeism (A; Cog & SP). (+) Project on in-house self-directed employee onboarding system driven by the business (A; SP & Tech). (+) Covid-19 related projects undertaken – due to restructuring needs primarily (A; Cog & SP).

Abbreviations: HR, human resources; HRBP, Human Resource Business Partner; HRIS, Human Resource Information System; GDPR, General Data Protection Regulation.

APPENDIX B

TABLE B 1 Evidence supporting the three subprocess theorised from raw process data

Subprocesses	Quotations
Strategic Commitment	<p>I think it counts, in our place it came from having a HR Director who believes in leveraging data as a catalyst for growth and I think that has to be the start point you can always find somebody who will work with that HR Director either within the HR team or drawing from the organisation, and I think that sustained focus and determination to stick with it until it succeeds is the critical key. Then you need to try and systemise and if you don't have any data you can't do anything, you need a certain amount of data to work with (Alpha, Head of Analytics, 1st Round of fieldwork).</p> <p>There is real unity of purpose and we would have daily meetings where we would go in at 9 o'clock and work all morning through the data communications and then in the afternoon, I would go off and work and then start again the next day and work through those again. So there was a huge engagement from the senior members [of HR] throughout the team (Alpha, Head of Analytics, 1st Round of fieldwork).</p> <p>The HR Function doesn't get involved in capacity and workforce planning at all. They will work with us on recruitment, we build the business case and it signed off with the CEO so HR are not involved in the decision but once that decision is made they support us with the recruitment. They also monitor things like bonus and performance management systems but it's up to us to do it. We have a relatively small HR function to be fair to them, payroll and administration and then each MD has a HR Support individual and they will work with us in relation to preparing business cases or anything. With this new ownership model, most responsibility has been devolved back into the business. We had centralised everything and then now de-centralised and the centre has shrunk significantly. That is our current organisation model and that may well change again so we just use the central HR as required (Alpha, MD 4, 3rd Round of fieldwork).</p> <p>We started keeping our ears open as to what was going on, what were the challenges, what were the important things, not just in HR but in the business as well. And I suppose we just took it upon ourselves then to start building projects and insights around things that we felt would help the business. And we also would have met with the HR leadership on a three monthly basis and we prioritise projects with them as well (Delta, HR Reporting and Data Analytics Manager, 2nd Round of fieldwork).</p> <p>If HR Analytics sits in HR, HR people loves them but the impact is only local and that's the challenge. If I were the CEO I would go for centralisation and integration of data, common approach to enterprise data and that's exactly what is happening. This is going to be transformational, there will be data-led interventions around costs, etc. Definitely HR has become more data-led over the past 2 or 3 years. We have come a long way. More data-driven and more digital, so data is becoming more and more important for HR (Delta, Head of Performance Management and Leadership Development, 3rd Round of fieldwork).</p> <p>Yes, I think we've got there now but it has taken some time. You come in and you have to do little bits and it's very much a relationship building, trust, and stuff. We're definitely at the stage now where we haven't demonstrated the full power of it. You could be here for 10 years and still be improving and advancing, but I think we've certainly built up enough confidence that people here including the Head of HR would look at us and go "Okay, I'm happy these are the guys for the job and we need to support them". So we're happy we're getting to that stage (Gamma, HR Reporting and Analytics Manager, 2nd Round of fieldwork).</p>

(Continues)

TABLE B1 (Continued)

Subprocesses	Quotations
Technological Infrastructure Decision	<p>HR data is been used more frequently because now it's part of the enterprise wide analytics department (Delta, Analytics Unit Head and Data Ethics Lead, 3rd Round of Interviews).</p>
	<p>Yes, we look at a hell of a lot data – particularly in organisational effectiveness. For instance, in workforce/manpower planning and in terms of my role, I look at performance management ratings, potential successors of the bank and the ratings they are currently getting, performance reviews on the 'what's' and the 'how's'. So, how much are you delivering and how much is that aligned to our values? I also look at the engagement figures, per team. I use psychometric data extensively too. Psychometric analysis in terms of competencies and potential. Psychometrics of team effectiveness, what are the characteristics of high performing teams in our organisation? A good number of data points. The problem is that often times we need to source them in different places for different data points. What is trying to do with colleagues in the HR Analytics team is to bring all this data into some sort of Score Car (Delta, Head of Performance Management and Leadership Development, 3rd Round of fieldwork).</p>
	<p>It is easier to get your hands on other data now, because once you need business data, you have to start a process to get access. And that would have taken weeks, to chase the person until they would give you access. Whereas now, he/she will more likely be someone of the Analytics team that you now, and then it gets done a lot faster. For instance, I did a project before 2018 around how many people work remotely and uses remote access. I think it took me about four weeks to get the data. Now, it's a lot quicker to get there because the contacts would have been already established. Someone will know someone in that team, or IT, or a Business Manager. A lot of ore synergies around getting the information when is needed (Delta, Senior HR Data Analyst and Data Manager, 3rd Round of fieldwork).</p>
	<p>Absolutely, so you get data wars. Whose data is right? I am the person who produces data on this so I am right. And then you would get situations where I would say you need to get you and you in a room and discuss what needs to be fixed, and they say no we did that before. Ok, well, how do you get over it? Most of the problems are people (Gamma, Central Systems and Business Intelligence Manager, 1st Round of fieldwork).</p>
	<p>It is kind of a mixed model. If you want to do analytics now you have to centralise. It is too hard otherwise. You need a common vision map, a dashboarding tool. You need the skills that can do things like mapping, modelling but you want to push data out. You want to centralise the factory buy pushing the data as far into the decision makers. There is a tension there between that factory and the way data is being used. Our role is to act as the intermediary to be relevant and anticipate the next big thing. And at the same time to understand the mechanics and ensure the whole thing works and that you have the capacity to work with the volume you get (Alpha, Head of Analytics, 1st Round of fieldwork).</p>

TABLE B 1 (Continued)

Subprocesses	Quotations
	<p>When analytics was centralised it was a major function, well-staffed and well manned and very high brow. They were a centre of excellence for analytics and I had never worked with a function like that, as good as it was at that time but then it had less resources and now it has been reduced significantly and the focussed now is this is the problem, get the data you need to solve the problem and move on, it is not what it used to be anymore. Previously it was much more about insights, we have all the data we need across the business and we can look at that from a higher level and understand every moving part of the business and we can deep dive any bit of that we want. But the automated date, the self-reporting is what powers the business and that is good and drives the business. But we did stop all the good stuff around customer propensity modelling and where we had stores or networks and overlaying that data to see where the opportunities were and we don't do that anymore, we still have that data but it is more about being operationally agile and tactical (Alpha, MD 3, 3rd Round of fieldwork).</p> <p>There are two reasons we have a workforce management tool for day to day management of jobs but also our strategic operation for capacity planning and simulation modelling and how we reorganise maybe once or twice a year. We use software called Witness, it's a dynamic modelling tool and takes the average profile of faults at team and exchange level and then use that profile against the forecasted faults for the coming year and then use performance data on passed history as to how quickly technicians clear faults and then put in a percentage productivity increase and use technician availability each week and input some assumptions e.g. overtime and then put in what service levels we are looking for and then we look at that from a dynamic perspective and tries to simulate what the services would look like and if a fault comes in to a particular geographical area it will simulate the service around that fault over time. So using those parameters we can predict our service levels say with the current workforce and pattern of faults we can see we will have an 83% service level next year but if we move around programmes e.g. roll outs rather than repairs or add in additional technicians or upskills so it could be an apprentice or a more experienced technician we can see what we need, who we need and where we need them across the country. So we run numerous simulations and the inputs will vary but the output is always the service level. It's a decision making tool to allow us reorganise the workforce on an annual basis. It also allows us manage performance and from an IR perspective it has allowed us gain confidence in dealing with the Trade Unions as people cannot argue with data, it is a strong decision tool from a management perspective but also a very strong tool in relation to IR negotiations (Alpha, MD 4, 3rd Round of fieldwork).</p>
<p>Focus of HR Analytics projects</p>	<p>One example of the analytics we have done with HR was around attrition so we worked with HR on trying to identify who our good agents are and we looked at age, gender and performance and what were the commonalities across the high performing groups. What are the commonalities like did they work in a call centre before or how long did they stay in their previous jobs. And that analysis helped us develop a profile in the hope we could retain an agent for at least 18 months. It was HR who suggested we build a profile on what was the best type of agent. HR were a big factor in this as we were seeing the huge attrition so the starting point with HR was how do we stop attrition and then we realised maybe we made the mistake earlier on for example anyone who was taking a job in May didn't tell us they were still in college and would be leaving in September so as we started to see the key pointers then we knew we had to build these into our recruitment and interview process (Alpha, MD 5, 3rd Round of fieldwork).</p>

(Continues)

TABLE B 1 (Continued)

Subprocesses	Quotations
	<p>They are doing something about it [reducing silos across business functions] through the workforce planning project. They are trying to implement a system called OneView so that we can bring together all of that data. We are much closer now to some data integration. We are integrating some finance and HR data from a cost perspective, from a numbers perspective. We have now some HR and Finance Data working together. What I would like to see now is some customer data. Marketing data, how we bring all the data together and that's where the magic happens I think (Delta, Head of Performance Management and Leadership Development, 3rd Round of fieldwork).</p>
	<p>Before the move [from the HR function to the Central Analytics Unit] a lot of the requests were coming from the business units and not from HR. It would have been from the HRBPs. They would have come with operational issues a lot more than strategic HR. There is a lot more coming from the business now from the point of view of strategic priorities (Delta, Senior HR Analyst and Data Manager, 3rd Round of fieldwork).</p>
	<p>Working closely with the IT team to track how people are working remotely [during COVID-19]. More people have become project based and they are using more PM tools to segregate and fragment the work and getting done in a particular way through bite sized chunks of time. More easy to track in IT and Analytics but more challenging in other areas of the business (Delta, Senior HR Analyst and Data Manager, 3rd Round of fieldwork).</p>