21st century HR: a competency model for the emerging role of HR Analysts

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Abstract

Purpose – Drawing on human capital theory and the human capital resources framework, this study explores the knowledge, skills, abilities and other characteristics (KSAOs) required by the emerging role of human resource (HR) analysts. This study aims to systematically identify the key KSAOs and develop a competency model for HR Analysts amid the growing digitalization of work.

Design/methodology/approach – Adopting best practices for competency modeling set out by Campion *et al.* (2011), this study first analyzes 110 HR analyst job advertisements collected from five countries: Australia, Canada, Ireland, the United Kingdom and the USA. Second a thematic analysis of 12 in-depth semistructured interviews with HR analytics professionals from Canada and Ireland is then conducted to develop a novel competency model for HR Analysts.

Findings – This study adds to the developing and fast-growing field of HR analytics literature by offering evidence supporting a set of six distinct competencies required by HR Analysts including: consulting, technical knowledge, data fluency and data analysis, HR and business acumen, research and discovery and storytelling and communication.

Practical implications – The research findings have several practical implications, specifically in recruitment and selection, HR development and HR system alignment.

Originality/value – This study contributes to the evolving HR analytics literature in two ways. First, the study links the role of HR Analysts to human capital theory and the human capital resource framework. Second, it offers a timely and empirically driven competency model for the emerging role of HR Analysts.

Keywords Competency models, Human resource analytics, People analytics, HR Analysts, Strategic HRM, Human capital resources

Paper type Research paper

Introduction

Over the past several years, the number of organizations leveraging workforce data to inform strategic workforce decisions has grown significantly. As a result, human resource (HR) analytics has received increasing attention within the HR literature, as evidenced by two recently published special issues: first, in the *Journal of Organizational Effectiveness: People and Performance* (2017: Volume 4, Issue 2) and second, in *Human Resource Management* (2018: Volume 57, Issue 3). In contrast, HR analytics has also seen substantial growth in practice despite many HR departments lagging behind other organizational functions concerning the adoption of technology-enhanced, data-driven decision-making (Angrave *et al.*, 2016; Murphy and McCarthy, 2016; Vargas *et al.*, 2018; Dahlbom *et al.*, 2019; Fernandez and Gallardo-Gallardo, 2020). For example, many organizations have now begun to share their HR analytics "journey" and discuss how they are implementing HR analytics to aid in

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making strategic workforce decisions (Dulebohn and Johnson, 2013; Schiemann *et al.*, 2018). However, despite organizations placing significant emphasis on HR analytics and its potential strategic impact, the human capital inputs required for successful HR analytics remain unclear (Huselid, 2018). Therefore, this study aims to address this gap by developing a competency model for HR Analysts by systematically identifying the knowledge, skills, abilities and other characteristics (KSAOs) required to successfully perform HR analytics activities.

The digitalization of HR, driven by the widespread adoption of information technology, has significantly contributed to the growth of HR analytics (Marler and Boudreau, 2017). Thus, offering HR professionals the tools to quickly and efficiently analyze the growing amount of workforce data at their disposal (Dulebohn and Johnson, 2013; Marler and Boudreau, 2017; van den Heuvel and Bondarouk, 2017; McIver *et al.*, 2018). For example, Google has begun to collect and analyze candidate and employee data to make more data-driven recruitment and selection decisions (Harris *et al.*, 2011; Shrivastava *et al.*, 2018). Moreover, Bank of America, in collaboration with Humanyze, has begun to analyze data from various mediums such as cell phones, emails, social media and motion sensors to aid in making workforce decisions (Kane, 2015). In light of this digital transformation, the demand for HR professionals who possess the KSAOs required to effectively conduct, perform and interpret analytics has seen a dramatic increase; thus, leading to the development of a new and distinct role within the HR function: the HR Analyst (van den Heuvel and Bondarouk, 2017).

Despite the growing increase of HR Analyst roles in organizations, the shift toward using data to make strategic workforce decisions still poses a challenge for the HR function (Angrave *et al.*, 2016; King, 2016; Marler and Boudreau, 2017; Kryscynski *et al.*, 2018; Minbaeva, 2018; Edwards and Edwards, 2019). According to Edwards and Edwards (2019), those currently employed in HR analytics roles have a basic understanding of HR analytics, with very few having the competencies to conduct predictive HR analytics. This is highlighted in a recent study conducted by Chartered Institute of Personnel and Development (CIPD) and Workday (2018), where only 21% of HR professionals in the United Kingdom (UK) are confident in performing advanced HR analytics. However, despite these challenges, some organizations, through the recruitment of specialized talent, succeed in using HR analytics to make strategic workforce decisions (Harris *et al.*, 2011; van der Togt and Rasmussen, 2017; Peeters *et al.*, 2020). For example, Royal Dutch Shell, an oil and gas organization, built their HR analytics capability by recruiting employees with significant knowledge of statistics, applied mathematics, psychology, economics and who could communicate a compelling data story (van der Togt and Rasmussen, 2017).

This study draws upon human capital theory (Becker, 1964) and the human capital resource framework (Ployhart *et al.*, 2014) to suggest that the newly emerging role of HR Analysts are valuable human capital resources. This argument is justified given the specialized KSAOs they bring to the HR function and their ability to inform critical strategic workforce decisions. Subsequently, acknowledging that human capital resources manifest through the individual KSAOs (Ployhart and Moliterno, 2011), this study adopts several best practices set out by Campion *et al.* (2011) to systematically develop a competency model for the role of HR Analysts.

The development of a competency model for HR Analysts is particularly important amid the current skills debate evolving within the field of HR analytics. First, recent literature in HR analytics suggests that there exists a significant incongruence between academics and practitioners concerning the competencies and skills that are required to perform HR analytics (Andersen, 2017; van der Togt and Rasmussen, 2017; McIver *et al.*, 2018; Minbaeva, 2018). As such, the development of a holistic and overarching competency model will offer insight and clarity into the specific KSAOs required by HR Analysts to perform in their role and translate organizational strategy into employee behavior (Campion *et al.*, 2011, 2020).

Second, the competency model will allow organizations to plan their HR requirements more adequately. For instance, certain KSAOs may already exist within the internal labor market, while other KSAOs may need to be drawn from external sources. Likewise, a competency model will aid in informing recruitment and selection processes, thereby attracting the necessary talent required for building their HR analytics capability. Equally, developing a competency model for HR Analysts has considerable value from an educational, training and development perspective (Campion *et al.*, 2011; Getha-Taylor *et al.*, 2013). According to Getha-Taylor *et al.* (2013), competency models offer a distinct link between learning opportunities and future development goals. Therefore, the development of a competency model for HR Analysts has significant value serving as a guide for individual development, as well as for universities and organizations when designing learning outcomes specific to the development of HR analytics capabilities. Given these points, this study makes theoretical and practical contributions to HR analytics by developing a competency model for HR Analysts.

This paper is organized as follows: first, a review of the extant literature is presented, offering an overview of human capital theory, human capital resources and the evolving debates in HR skills and competencies. Second, we outline the methodological approach, including data collection, coding and analysis process. Next, we delineate the six competency themes identified from the findings, leading to the development of a competency model for HR Analysts. Finally, we outline our study's theoretical and practical contributions and areas for future research.

Literature review

Human capital theory and human capital resources

Becker (1964) first defined human capital as the knowledge, information, ideas, skills and health of individuals. Over the past two decades, the concept of human capital has evolved and can generally be referred to as the KSAOs of employees (Youndt and Snell, 2004; Coff and Kryscynski, 2011; Ployhart and Moliterno, 2011; Wright and McMahan, 2011; Ployhart *et al.*, 2014; Wright *et al.*, 2014; Nyberg *et al.*, 2018). More recently, scholars have begun to discuss the emergence of human capital resources (Ployhart and Moliterno, 2011; Ployhart *et al.*, 2014; Wright *et al.*, 2014; Nyberg *et al.*, 2018), which focus on the unit level or functional impact that emerges from the KSAOs of individual employees. Furthermore, Nyberg *et al.* (2018) claim that human capital resources are also the primary means through which units can compete via specialized talent.

At the individual level, human capital resources manifest from the individual employee's KSAOs (Ployhart and Moliterno, 2011; Ployhart *et al.*, 2014). According to Ployhart *et al.* (2014), to be considered a human capital resource, the KSAOs must be a specific feature of the function that is accessible for unit-relevant purposes. In other words, human capital resources can only be considered a resource if the individuals KSAOs can be leveraged and contribute to the overall goal of the function.

Building on this notion, we argue that the emerging role of HR Analysts are human capital resources for two reasons. First, due to the broader and specialized KSAOs they bring to the HR function. According to (van den Heuvel and Bondarouk, 2017), the role and responsibilities of HR Analysts are distinct from other HR roles, such as the HR business partner or HR generalist. For example, HR Analysts support HR business partners by gathering data from various business functions and conducting analysis offering data-driven insights on their workforce (van den Heuvel and Bondarouk, 2017). Moreover, HR Analysts use multiple forms of technology to collect and transform data into valuable workforce insights to drive strategic decision-making (Kapoor and Sherif, 2012; van den Heuvel and Bondarouk, 2017; van der Togt and Rasmussen, 2017; Minbaeva, 2018). Second, HR Analysts offer value to the HR function by leveraging their specialized KSAOs to make strategic workforce decisions leading to higher performance. For example, in a case study conducted

with Inditex, a large Spanish multinational fashion retailer, as part of their workforce analytics program, HR Analysts with a background in engineering and quantitative analysis played a significant role in collecting, analyzing and reporting data linked to key performance indicators. As a result, the insights gathered by the HR Analysts allow HR managers at Inditex to effectively monitor and make more evidence-based decisions around their workforce, resulting in higher overall store performance (Simón and Ferreiro, 2018).

Evolving debates in HR competencies

HR has seen a substantial transformation over the past 40 years, becoming a value-adding strategic partner (Cohen, 2015; Ulrich and Dulebohn, 2015). As such, academics have raised questions and debated which competencies and KSAOs are required to match the newly established strategic demands (Ulrich *et al.*, 1995, 2017a, b; Liu and Lee, 2015; Lo *et al.*, 2015; Mcdonnell and Sikander, 2017; Vu, 2017).

To date, HR professional competencies have been primarily focused on a universalist approach that applies a set of overarching and generic competencies that can relate to the entire HR profession (Capaldo *et al.*, 2006; Lo *et al.*, 2015; Ulrich *et al.*, 2017a, b; Vu, 2017). The adoption of the universalist approach among organizations is due to the ease that core competencies can be adapted and applied to multiple jobs while also being more efficient and cost-effective (Capaldo *et al.*, 2006; Getha-Taylor *et al.*, 2016). Despite its benefits, one major criticism of this approach is that it does not consider organizational attributes such as organization size, culture, role or function (Capaldo *et al.*, 2006). As a result, this has given rise to the situational perspective, which argues competencies are context-specific, influenced by the social context where the competencies are performed and how employees make sense of their jobs (Capaldo *et al.*, 2006). In other words, HR competencies should be tailored to a specific role given the variation among roles and the different sets of HR competencies required to perform job tasks (Schoonover, 2003; Lo *et al.*, 2015; Vu, 2017). Taking a situational approach, HR professionals working in traditional generalist roles will require a different set of KSAOs and competencies than HR Analysts, given the differences in job-related tasks.

The HR analytics skills debate

Within the existing HR analytics literature, debate continues to exist concerning the conceptualization of HR analytics. For example, some scholars refer to HR analytics as an HR practice with Marler and Boudreau (2017, p. 15) suggesting that HR analytics is *"[A]n HR practice enabled by information technology that uses descriptive, visual, and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and enable data-driven decision making*." In contrast, other scholars have suggested that HR analytics is a process (Huselid, 2018; McIver *et al.*, 2018). For example, McIver *et al.* (2018, p. 2) suggest that *"Workforce Analytics is a process - one that is continuously advanced by improving problem-solving through sound measurement, appropriate research models, systematic data analysis, and technology to support organizational decision making*."

Regardless of whether HR analytics is considered a process or practice, HR analytics can be viewed as a more technical, analytical and data-centric role, requiring a specific set of KSAOs and various analytical and technical competencies (Andersen, 2017; Green, 2017; van den Heuvel and Bondarouk, 2017; van der Togt and Rasmussen, 2017; Minbaeva, 2018). However, no clear consensus has been reached on the particular set of KSAOs required by HR Analysts, with much of this debate focused on observation and anecdotal evidence, rather than empirically supported competency models. For example, according to De Mauro *et al.* (2018), the description of skills and responsibilities of analytics roles is imprecise, with organizations relying on subjective interpretations of their needs rather than objective evaluations.

Nevertheless, scholars have recently begun to debate the KSAOs they deem essential for HR Analysts (Andersen, 2017; van der Togt and Rasmussen, 2017; McIver *et al.*, 2018; Minbaeva, 2018). For example, according to Andersen (2017), for HR Analysts to perform their jobs well, they need to have excellent statistics and number skills, robust data management skills, the ability to create data visualizations and be captivating storytellers. In a similar vein, van der Togt and Rasmussen (2017) have argued that HR Analysts need to have a strong business focus, a deep understanding of behavioral science, excellent data and statistical skills and the ability to tell a data story. Additional skills highlighted in the extant HR analytics literature as essential for HR Analysts include problem-solving capabilities (Durai *et al.*, 2019), analytical and IT skills (Mishra *et al.*, 2016), building and testing conceptual and predictive models (Mishra *et al.*, 2016; Minbaeva, 2018), data mining (Liu *et al.*, 2020) and a familiarity with software packages from broader data science, including *R* and Python (McIver *et al.*, 2018; Tonidandel *et al.*, 2018; Falletta and Combs, 2020; Pessach *et al.*, 2020).

From a practitioner standpoint, professional associations such as the CIPD and the Society for Human Resource Management (SHRM) have also begun to engage in this debate. For instance, the Society for Human Resource Management (SHRM) suggests that HR Analysts must be able to use data to predict workforce performance and improvement, conduct multiyear workforce planning and correlate or otherwise model relationships between HR data and business performance (SHRM, 2016). Furthermore, organizations such as Chevron have developed extensive training and development programs for HR Analysts focused on eight areas of specialization including: analytical thinking, business analytics and statistics, data gathering, reporting and analytical tools, effective communication, business and financial acumen, tactical and strategic planning and storytelling (Deloitte, 2017).

Methodology

According to Campion *et al.* (2011), the development and implementation of competency models can be divided into three distinct phases: first, analyzing the competency information; second, organizing and presenting the competency information; and third, using the competency information. This research draws on the first two phases of best practices outlined by Campion *et al.* (2011) (i.e. analyzing competency information and presenting competency information) to develop a competency model for HR Analysts. Specifically, this study adopts three best practices to analyze competency information, including: starting from the top through interviewing HR analytics leaders, using rigorous methods to develop competencies (i.e. thematic analysis) and using additional and unique methods by gathering insight from job advertisements. Concerning phase 2, this study adopts three best practices regarding the presentation of the competency model, including: defining the anatomy of a competency, achieving the proper level of granularity through clearly identifying each competency and associated KSAOs and using diagrams to communicate the competency model.

Data collection

Data was first collected from job advertisements sourced through online job boards. Job advertisements were selected as a suitable source of data as they are easily accessible, offering insight into how organizations view the role and act as reliable sources for demonstrating competencies required for successful performance (Harper, 2012; Kim *et al.*, 2013; Carliner *et al.*, 2015). Moreover, analyzing job advertisements is an appropriate method for identifying emerging market trends and the shifting demand for skills required by specific roles (Harper, 2012). The job advertisements were collected from five countries, including: Australia, Canada, Ireland, the United Kingdom and the USA. These countries were selected for two reasons, first, due to their large membership and presence in HR

professional associations such as AHRI, CIPD, HRPA and SHRM, respectfully. Second, according to a 2017 Deloitte study, respondents from each of the countries identified HR analytics as an "important" or "very important" trend, indicating a higher level of interest in HR analytics than other countries.

Job advertisements were sourced from Indeed, LinkedIn and Monster.com. Each job board was selected due to its popularity and high reputation among recruiters. Each job board was monitored daily for a period of three months, from May 1, 2018, to July 31, 2018, using the following job titles and keywords: "Human Resource Analyst"; "HR Analyst"; "HRIS Analyst"; "HR Data Analyst"; and "HR Reporting Analyst." Due to the uniqueness of the role at the time, the total sample collected was 110 job advertisements, of which 15 were obtained from Australia, 35 from Canada, 25 from the combined Ireland and United Kingdom and 35 from the USA.

In keeping with the best practices set out by Campion *et al.* (2011), the second phase of data collection involved conducting 12 semistructured interviews with HR analytics professionals from Canada and Ireland. A criterion-based sampling method was used on the basis that all participants being interviewed had experience working within an HR analytics department or had extensive knowledge of HR analytics. The positions of the participants varied between mid-level, senior-level and executive roles. Table 1 summarizes the demographic breakdown of the participants involved in the research project.

Six interviews were conducted in person, while the remaining six interviews were conducted through Skype. Each participant was asked a standard set of seven questions based on claims from existing HR analytics competency literature and focused on two key themes: 1. Competencies and 2. Technology. The seven interview questions asked can be found in Table 2.

		Number of participants	Percentage of participants
Gender	Male	7	58%
	Female	5	42%
Age	18–30	2	17%
	31–45	6	50%
	46–55	3	25%
	56–65	1	8%
Years of experience	0–5	3	25%
	6–10	3	25%
	11–20	3	25%
	20+	3	25%
Level of education	Bachelor's degree	4	33%
	Master's degree	5	42%
	Doctorate degree	3	25%

Table 1.
Demographics of participants

Theme	Interview question
Competencies	1. What competencies do you think are the most important for HR Analysts?
Competencies	2. Do you feel that HR Analysts need a different set of competencies compared to existing HR professionals?
Competencies	3. How important is storytelling from an HR analytics perspective?
Technology	4. What type of tools/technology do HR Analysts need to do their job effectively?
Technology	5. What technical skills do HR Analysts need to be effective in their role?
Competencies	6. What competencies do you feel are most lacking in HR Analysts?
Competencies	7. Is there overlap between HR Analysts' competencies and those of data scientists?

Table 2.
Interview questions

Coding method and data analysis

Content analysis was conducted on the job advertisements as it allows for the systematic condensing of data into thematic categories based on a comprehensive coding process (Stemler, 2001; Hsieh and Shannon, 2005). NVivo was used to perform the coding and categorization process, given its ability to organize and manage large amounts of data, documents and visually model results (Hilal and Alabri, 2013). Each job advertisement was loaded into a new NVivo project for analysis. To gain an understanding of the role, each document was read in detail, and subsequent codes were generated from text data comprised of keywords and statements related to the skills and competencies relevant to HR Analysts. Text data were exclusively derived from three sections of each job advertisement, which included: job summary, responsibilities and skills or qualifications required. These sections were selected as they offer clear insight into the core competencies and skills required by the HR Analyst. Moreover, the responsibilities section demonstrates the tasks required by the HR Analyst aligning well to specific HR Analyst competencies. Sections such as company background, mission and values and how to apply were excluded from the coding process, as they offer no information concerning the competencies and skills required to perform the role. Once all codes had been identified, each code was grouped and classified into five clearly defined competency themes.

The second phase of data analysis involved conducting a thematic analysis of the interview transcripts. Thematic analysis was conducted following the thematic analysis process outlined by Braun and Clarke (2006) and was the chosen method as it allows for the clear identification and classification of themes and patterns by using a systematic coding process (Boyatzis, 1998; Braun and Clarke, 2006; Ibrahim, 2012). Similarly, performing a thematic analysis can provide a high degree of detail and help interpret many aspects of the research question or research topic (Braun and Clarke, 2006). Each of the interview transcripts were loaded into a new NVivo project and then read to familiarize and gain an understanding of the data. Once each transcript had been read thoroughly, keywords, phrases and statements discussed by each participant relating to the skills and competencies required by HR Analysts were coded. Finally, all codes that had been identified were then grouped and classified into clearly defined competency themes.

To ensure the reliability, accuracy and consistency of the coding method applied, two researchers independently coded each job advertisement and interview transcript. Intercoder reliability (ICR) was then assessed and calculated following the method outlined by Miles *et al.* (2014), where the reliability of each code is a function of the number of coding agreements among coders versus the number of coding agreements and disagreements (Campbell *et al.*, 2013; Miles *et al.*, 2014; O'Connor and Joffe, 2020). This yielded an overall ICR of 91%, suggesting appropriate reliability had been achieved (Kurasaki, 2000; Fahy, 2001; Campbell *et al.*, 2013; O'Connor and Joffe, 2020).

Research findings

Content analysis of job advertisements

The content analysis of the job advertisements yielded 1,597 skill references representing 38 KSAOs critical to the HR Analysts' role. Each of the 38 identified KSAOs were classified into five distinct competency themes: technical knowledge, consulting, data fluency and analysis, storytelling and communication and HR and business acumen. Table 3 summarizes the percentage of skill references in each competency theme identified through the content analysis.

Technical knowledge

Technical knowledge represented the most significant percentage of skills referenced among the 110 job advertisements. 90% of all job advertisements highlighted that the HR

Analyst role requires an in-depth knowledge of human resource information systems (HRIS) and databases. Similarly, 65% of all job advertisements suggested that HR Analysts also require an advanced understanding of Microsoft Excel. Likewise, 56% of job advertisements suggested that HR Analysts require knowledge of various technology platforms and business intelligence tools including Tableau and Power BI. Additional highly required skills concerning the theme of technical knowledge included the ability to maintain data integrity and data quality (35%), perform system maintenance, testing and HRIS support (27%), HRIS implementation (15%) and coding and programming languages (14%).

Consulting

The competency theme of consulting was the second most referenced competency required by HR Analysts. According to many job advertisements, HR Analysts are required to be exceptional consultants as they offer insight, recommendations and strategies to various stakeholders based on workforce data. As such, HR Analysts require a wide range of consulting skills, including a high attention to detail, which was mentioned in 37% of all job advertisements. Additionally, 36% of job advertisements highlighted the need for HR Analysts to be effective problem-solvers. Furthermore, 33% of job advertisements highlighted that HR Analysts require skills surrounding decision-making and judgment to effectively recommend data-driven solutions to organizational challenges. Additional skills outlined for the competency theme of consulting included organizational skills (29%), intrapersonal skills (28%), project management (25%), teamwork (24%), collaboration (22%) and critical and strategic thinking (16%).

Data fluency and data analysis

The competency theme of data fluency and data analysis is closely aligned to the competency of technical knowledge outlining the skills required by HR Analysts to effectively utilize workforce data for analysis. 69% of job advertisements highlighted that HR Analysts must display reporting skills that allow the analyst to generate statistical and analytical reports. Furthermore, 60% of all job advertisements mentioned that data analysis and the ability to analyze, manipulate and interpret data are critical skills required by HR Analysts. Additional highly required skills highlighted for the competency theme of data fluency and analysis included numerical and analytical skills (39%), data collection and extraction (33%).

Storytelling and communication

The competency theme of storytelling and communication focuses on the HR Analysts' ability to effectively translate workforce insights into compelling stories. Accordingly, the HR Analysts' ability to effectively communicate with stakeholders and senior leadership was addressed by 71% of all job advertisements. Presentation skills were also mentioned by

Table 3. Percentage of skill references in each competency theme

Competency theme	Skill references (%)
Technical knowledge	31
Consulting	27
Data fluency and data analysis	25
Storytelling and communication	12
HR and business acumen	5

17% of all advertisements as being extremely important when communicating insights to senior leadership. Likewise, 8% of advertisements specifically discussed the concept of storytelling, stating that storytelling is critically important as HR Analysts need experience crafting their analyses and recommendations to engage with nontechnical audiences. Additional skills highlighted for the competency theme of communication and storytelling included Microsoft PowerPoint (27%), Microsoft Word (20%) and persuasion and influence (5%).

HR and business acumen

The final competency theme identified from the job advertisements was HR and business acumen. 82% of job advertisements indicated it is essential for HR Analysts to have a fundamental understanding of HR practices, including: recruitment and selection, compensation, employee and labor relations and training and development. Likewise, 18% of job advertisements indicated that for HR Analysts to be effective in their role, they must exhibit a significant understanding of business operations, management practices and overall business objectives.

Thematic analysis of interview transcripts

Essential competencies for HR Analysts

The thematic analysis identified five competencies that are important for HR Analysts. First is business acumen and understanding the business, referring to the analysts' ability to know and understand how to apply analytics to the overall business strategy. Half of the study participants identified this as very important with participant 2, stating that "*First and foremost, you need an understanding of the business you're in. Business knowledge is fundamental. When we look at analytics, you have to be able to frame it within the context of the organization and the organizational strategy.*" Similarly, participant 5 claims that "*You need an in-depth understanding of the business. You need to know the business because you need to have use cases and the understanding to build solutions that are meaningful to the business.*"

The second identified competency through the thematic analysis was data fluency and data analysis, which was discussed by ten of 12 participants. Data fluency and data analysis center around the analysts' ability to work with, manipulate and understand data. Participant 10 suggested, "*You need somebody who is comfortable working with data. An HR Analyst or Data Analyst needs to have data fluency and data intelligence. They need to have a base comfort around data, and they need to be able to merge it together intelligently and accurately to produce the answer.*"

Third was the competency of research and discovery, which focused on the ability to frame up questions that were relevant to the business. Participant 9 described it as a critical and essential competency saying, "*To do HR analytics, you need to be able to frame up a question. You need to be able to take a research question and create a testable hypothesis, and that would result in some change in decision making."*

Storytelling and communication was the fourth competency identified and mentioned unanimously among participants. The competency of storytelling and communication was described as the ability to convey and translate data into a meaningful story that can inform a business group or a specific audience. For example, participant 9 suggested that the importance of storytelling is "*Absolutely critical*," stating that, "*Your analytics will have zero impact if you cannot convince people that it matters. Not only what you found, but also how it works. You need to tell people you have a finding, and you need to tell them something about causality to give them the 'so what?'... having the ability to create a*

narrative arc using storytelling is important because it goes beyond tables, it creates visuals." Likewise, participant 11 also ranked the competency of storytelling very high, stating that, "*I would put it up there as one of the top three capabilities or competencies that HR Analysts would need*." Moreover, Participant 10 suggested that "*The best HR Analysts are the ones who can find the balance between being a high-end Data Analyst and somebody who can tell the story and translate the information to the people that they are working with*."

Lastly was the competency of technical knowledge. This was determined as a necessary competency based on recurring responses around themes such as coding and programming languages, for example, SQL, in addition to Excel, databases, machine learning, reporting and creating data visualizations. Having the technical knowledge and ability to create data visualizations was a strong focus of this competency. Participant 8 suggested that "*HR Analysts need technical skills in things such as data visualization. Understanding tools such as Tableau or Power BI and being able to create visual dashboards and interactive charts will allow the users to see in a straightforward way what is being presented*." Another widely discussed technical skill was understanding systems such as HRIS or human capital systems (HCS). Participant 4 said, "*Having technological abilities and being able to use different systems and pull data from different systems is an important capability for HR Analysts*."

HR Analysts need different competencies than traditional HR roles

Ten of the 12 participants highlighted that HR Analysts need a different set of competencies than HR professionals, such as HR business partners and HR generalists. According to participants, the main differentiator between these roles is the higher technical knowledge needed and the ability to work with data. For example, participant 3 stated, "*When it comes to technical know-how, it is a skill set that HR Analysts need more than HR Business Partners*." Similarly, participant 6 said that, "*HR Business Partners need to have more relationship management skills than an HR Analyst, whereas an HR Analyst will need to be more technical and needs to be someone who enjoys working with data."* Participant 10 also highlighted that, "*HR Analysts need to have a comfort with technology."*

Although ten of 12 participants agree that HR Analysts need a different set of competencies than other HR professionals, a few participants mentioned similarities between the competencies that HR Analysts and HR business partners share. For example, participant 8 commented that "*A Business Partner needs to be strategic and have conflict management skills which, to a degree, an Analyst might need as well. So yes, I think they do need a different set of competencies but it's not to say that some will not overlap*". Similarly, participant 10 stated, "*I think they do need a lot of the same competencies, but the HR Analyst has to have that capability or that competency to work with data that the HR Business Partner does not*."

Technological skills and competencies required by HR Analysts

As stated by each of the 12 participants, the HR Analyst's role is technically demanding and requires a wide range of technical skills. Therefore, HR Analysts need to be familiar with various tools and technologies such as Microsoft Excel, HRIS, visualization tools, databases and statistical programs. Ten of the 12 participants mentioned how critical Microsoft Excel is for an HR Analyst. With participant 4, stating that "*Last year my organization conducted a survey, and one of the questions we asked was what tools and technologies people were using to conduct HR analytics. The majority of respondents said they were using Excel."* In addition to Excel, seven of the 12 participants said that an HRIS or database is an essential tool needed by HR Analysts. Participant 4 noted that "*Having the right systems in the background like a clean*

HRIS or database and having all of your data in one place is critical." Similarly, participant 1 said "*A human capital system that will collect data and information in one central place and allows you to create ratios, distributions, query data, and run reports is very important for HR Analysts.*"

Moreover, half of the participants said that HR Analysts need to be familiar with at least one visualization tool. Specific programs such as Tableau, Power BI and R were mentioned as examples that allow HR Analysts to visualize their data. Participant 6 stated, "*Data visualization is a technical skill that is becoming especially important, particularly in HR, as more and more organizations start to develop analytics.*" Another critical aspect of data visualization mentioned was the ability to display data that aids in the storytelling process. Participant 4 said, "*You need to be able to display the data in a meaningful way and I think it comes back to the way to get your dashboard to tell a story.*"

Lastly, mentioned by a quarter of participants was knowledge of statistical programs. Participant 12 stated that "*Statistical tools are especially useful for an HR Analyst.*" Likewise, participant 9 suggested that "*Having base statistics packages like SPSS, SAS, or Stata, is good. You can also use something more code-based like R.*"

Competencies that HR Analysts currently lack in practice

Participants outlined three competencies currently lacking in HR Analysts. First is a lack of business acumen and knowledge of HR. Participant 3 suggested that this is due to their lack of business background, claiming, "*The biggest thing, in my opinion, is the lack of business acumen. Many people who come into HR who do not come from business backgrounds do not understand that sort of stuff. I have often noticed someone who comes in from a mathematical background to an HR Analyst role and learns HR is more successful than coming in from an HR background.*" Similarly, participant 9 stated that "*Many of the people who are technically strong, analytically strong, do not have any background in business or HR.*"

Secondly, half of the participants mentioned the lack of data analysis, statistical analysis and reporting skills. Participant 10 stated that "*It is difficult to find people who are data-savvy in HR. I recently had a chat with a VP from another organization who mentioned that they were finding it difficult to even find people for simple HR reporting.*" Likewise, participant 1 commented that "*Historically many of the professionals who came into HR underwent HR education and the certification process, but they did not have predictive modelling, or statistical modelling, because HR education does not teach these skills.*" Furthermore, participant 8 suggested that "*Many Analysts are lacking that statistical knowledge or understanding with data tools. Many Analysts do not traditionally come from a background that would provide them with strong analytical skills or training in performing statistics.*"

Lastly was the element of storytelling. This competency was mentioned by seven of the 12 participants as a challenging skill to find among HR Analysts. For example, participant 9 said, "*Storytelling would be the biggest competency lacking right now… Pure analysts really cannot tell the story very well. They tend to want to tell you the process of how they got the information rather than the story of what the data means… Being capable of turning data into a story, that's important.*" This statement was supported by participant 4, who also said that "*Often I think the communication piece and storytelling is missing because someone analytical their strength is analytics and not the communication.*"

Similarities between data scientists and HR Analysts

All 12 participants agreed when asked if there is a relationship between the competencies required by data scientists and by HR Analysts. For example, participant 5 stated, "*Of course,*

there is. You need to be an expert in data. You need to be a scientist and have a mathematical background with an in-depth understanding of the business." Furthermore, participant 6 described several similarities between the two roles, stating that *"Data Scientists can understand and use large data sets, they can identify patterns and use data that will benefit the organization. They also build and use predictive models to help with preventing different risks. This is something that I think will start to happen within HR Analytics as it matures and become more widely adopted."*

Overall, four competencies were identified as similar to those found within data scientists, including business acumen, data intelligence and fluency, third storytelling and technical knowledge.

Similarities and differences between content and thematic analysis

Overall, the results highlight several similarities between the competencies required by HR Analysts. For example, both sets of data outlined the need for a deep understanding of the business and having a substantial HR knowledge, a high degree of emphasis on the ability to work with data, the importance of communication and storytelling and acknowledging the technical competencies that are needed by HR Analysts. In contrast, each form of data revealed one competency that the other way did not. First was the competency of research and discovery, which was mentioned in the interview transcripts but was not a focus of the job advertisements. The second difference was the competency of consulting, where skills such as collaboration, change management, critical thinking, decision-making and strategic thinking were heavily requested skills in the job advertisements but were not discussed in depth by the interviewed participants.

Proposed competency model for HR Analysts

Figure 1 displays the proposed competency model for HR Analysts.

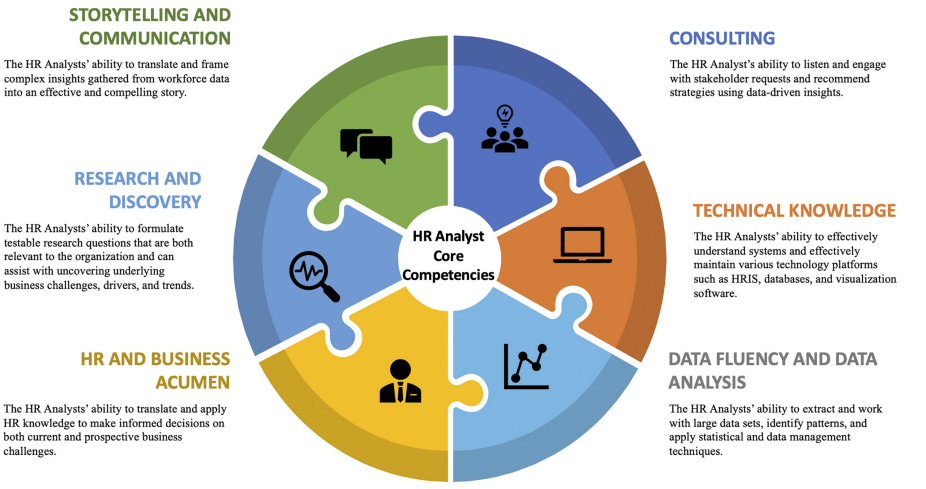

Figure 1.
HR Analyst competency model

Discussion

Adding to the HR analytics skills debate

Our study adds much-needed clarity to the existing HR analytics skills debate offering validation toward three of the competencies currently debated. First, we find support for the importance of storytelling and communication. Andersen (2017) suggests that HR Analysts need to create a compelling story around the data. Similarly, Minbaeva (2018) states that HR Analysts require the ability to communicate the results of statistical models using HR language to management in terms of telling a story beyond statistics. These two claims align closely with our findings, suggesting that the competency of storytelling and communication can be described as the HR Analysts' ability to translate and frame complex insights gathered from workforce data into an effective and compelling story. Second, HR Analysts must understand the business and have a strong sense of business acumen. This is also mentioned by Andersen (2017), who suggests that HR Analysts need to fully understand the customer value proposition, the organizational strategy, key differentiating factors and the overall financial situation of the organization. Likewise, van der Togt and Rasmussen (2017) suggest that HR Analysts need an understanding of the business to determine which questions are worth answering. Third, data fluency and data analysis were identified as a core competency by our participants. Andersen (2017) suggests that HR Analysts require excellent statistical ability and that HR Analysts will need to be comfortable performing simple regression and need more advanced statistical abilities. Both van der Togt and Rasmussen (2017) and McIver *et al.* (2018) also argue that statistical knowledge is essential. However, they do not explain how they define the competency or provide examples of specific statistical knowledge; our study attempts to address this.

Our study also advances new knowledge on competencies required by HR Analysts. For example, van der Togt and Rasmussen (2017) suggest that HR Analysts need a deep grounding in behavioral science. Similarly, Andersen (2017) claims that HR Analysts require strong psychological skills. However, despite these claims, none of our interviewed participants discussed the need to understand either behavioral science or psychology, nor did the job advertisements highlight this as a specific need for HR Analysts. As demonstrated by the content analysis, we also find that consulting skills are an essential competency required by HR Analysts; however, this competency is not found in the existing literature. Third is the competency of research and discovery. Our interview participants placed significant emphasis on this area acknowledging that HR Analysts need the ability to formulate a testable research question relevant to the organization and require the capability to discover business drivers and trends. However, this competency is not discussed or mentioned by previous scholars concerning HR analytics competencies. Lastly is the competency of technical knowledge. Needing a high degree of technical knowledge was seen in both the thematic analysis of interview transcripts and the content analysis of job advertisements. Although Andersen (2017), McIver *et al.* (2018) and Chevron (cited in Deloitte, 2017) do mention skills such as programming, data gathering, database, reporting and visualization, these are only a few of the skills that make up the competency of technical skills. As can be seen from our findings, the technical skills competency covers a much broader set of skills, including the ability to use HRIS, as well as systems knowledge and system maintenance, which have not yet been discussed by current researchers.

Theoretical and empirical contribution

To the best of our knowledge, the present study is the first to link the role of HR Analysts to human capital theory (Becker, 1964) and the human capital resource framework (Ployhart *et al.*, 2014). We argue that HR Analysts represent human capital resources due to the specialized set of KSAOs that they bring to the HR function, in addition to the performance

increase gained from leveraging the specialized KSAOs. HR Analysts' role and responsibilities are distinct from other HR roles since HR Analysts must gather data from various business functions and conduct analysis offering data-driven insights on their workforce (van der Togt and Rasmussen, 2017). As such, these types of job responsibilities demand a more technical, analytical and data-centric skill set to add strategic value through conducting and interpreting HR analytics. Moreover, HR Analysts offer value to the HR function by leveraging their specialized KSAOs to make strategic workforce decisions leading to higher performance.

Further, this study advances the existing HR analytics literature by offering timely evidence demonstrating the KSAOs and competencies required by HR Analysts to conduct, perform and interpret HR analytics effectively. Over the past several years, scholars and organizations have recently begun to suggest and debate the skills they deem essential for HR Analysts (Andersen, 2017; Deloitte, 2017; van der Togt and Rasmussen, 2017; McIver *et al.*, 2018; Minbaeva, 2018). However, despite these claims, evidence supporting the suggested skills required by HR Analysts has not been addressed within the existing HR analytics literature. As a result, this study offers empirical support for some of the suggested skills while highlighting several differences.

Practical implications

Our study has several important implications for practice. First, our findings can inform the recruitment process when hiring for roles such as HR Analysts. The findings suggest and outline several key competencies and KSAOs recruiters can identify in potential applicants. This list can help design job descriptions as they offer hiring managers and recruiters a significant amount of knowledge and provide an understanding around the specific KSAOs that are required to perform in the role successfully. Furthermore, by using technology platforms such as HRIS or applicant tracking systems, recruiters can systematically classify and identify suitable resumes and applications based on keywords and using search functions within the software program. Lastly, if organizations were to implement assessment centers, psychometric testing or skill testing as part of the recruitment process, the developed competency model would outline what KSAOs to examine and test for.

Second, from the perspective of HR development, the findings can aid organizations further mature their HR analytics capabilities, while also limiting potential knowledge gaps found currently within their HR department. For example, by understanding the KSAOs HR Analysts require to utilize and transform workforce data into actionable HR analytics, HR development programs can be implemented focused on the specific competencies currently lacking within the HR department. Moreover, these programs can have a significant impact on succession planning as they could use the program to enhance their internal talent pool in the event of employee turnover.

More broadly, the proposed competency model can be used actively to align HR systems (i.e. recruitment and selection, training and development and performance management) to organizational goals, thereby maximizing the impact of these systems on both individual and organizational-level performance.

Limitations and directions for future research

As with all research, the study is limited in a few ways. First, job advertisements were collected during a three-month period, yielding a small sample size of 110 job advertisements. Additionally, only 12 interviews with HR analytics professionals were conducted. We call on researchers to further test our competency model and to empirically examine which of the identified competencies are most important to the role of the HR analyst using larger sample sizes. Second, as the data is cross-sectional, future research using longitudinal data is

encouraged to better identify variance and capture changes concerning the KSAOs and tasks being performed by HR Analysts. Moreover, longitudinal data would also help examine HR analytics competencies and their relationship with organizational outcomes. Third, since HR analytics roles were relatively new and unique during the time of data collection, this resulted in a small amount of "HR Analyst" job advertisements. As such, the job advertisement's search terms were expanded to incorporate a broader definition of the HR analyst role to include roles such as "HRIS Analyst," "HR Data Analyst" and "HR Reporting Analyst." Future research is thus encouraged to examine and analyze the differences in the conceptualization of HR analyst roles and associated job roles across countries and industries.

Another potential avenue for future research is exploring the structure and design of HR analytic teams as well as the variance in roles found within the team. Mentioned by Andersen (2017), McIver *et al.* (2018) and by several of the interview participants, it is overly ambitious to find all required competencies in one individual. Therefore, HR analytics teams comprised of complementary roles need to be assembled to acquire the necessary KSAOs and transform workforce data into actionable insights. Equally important, and called for in the human capital literature, is exploring how human capital resources emerge to create competitive advantage (Wright and McMahan, 2011; Hazen *et al.*, 2014; Ployhart *et al.*, 2014; Nyberg *et al.*, 2018). According to Ployhart and Moliterno (2011), unit-level human capital resources are comprised of individual KSAOs; however, the impact of these KSAOs can be amplified and improved by the structuring of work tasks and other organizational factors (i.e. emergence). Therefore, future research is encouraged to explore this relationship by theorizing what, why and how emergence occurs in HR analytics teams, as well as its impact on HR practices and organizational performance. Additionally, we call on researchers to examine whether specific team designs are more beneficial than others and investigate whether industry shapes team design.

Conclusion

As the number of organizations leveraging workforce data to inform strategic workforce decisions grows, so too will the demand for HR Analysts. With the right competencies present, HR analytics can enable leaders and HR professionals to make evidence-based decisions, offering measurable insights aligned with organizational strategy. Failure to develop or implement a competency-based approach to this evolving role could limit the future success of HR analytics.

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