

PROVOCATION SERIES PAPER

HR and analytics: why HR is set to fail the big data challenge

David Angrave, Management School, University of Sheffield

Andy Charlwood, School of Business and Economics, Loughborough University

Ian Kirkpatrick, Leeds Institute for Data Analytics, Leeds University Business School

Mark Lawrence, Independent Strategic HR Analytics Consultant

Mark Stuart, Leeds University Business School

Human Resource Management Journal, Vol 26, no 1, 2016, pages 1–11

The HR world is abuzz with talk of big data and the transformative potential of HR analytics. This article takes issue with optimistic accounts, which hail HR analytics as a 'must have' capability that will ensure HR's future as a strategic management function while transforming organisational performance for the better. It argues that unless the HR profession wises up to both the potential and drawbacks of this emerging field and engages operationally and strategically to develop better methods and approaches, it is unlikely that existing practices of HR analytics will deliver transformational change. Indeed, it is possible that current trends will seal the exclusion of HR from strategic, board-level influence while doing little to benefit organisations and actively damaging the interests of employees.

Contact: Professor Andy Charlwood, School of Business and Economics, Loughborough University, Loughborough LE11 3TU, UK. Email: a.charlwood@lboro.ac.uk

Keywords: HR analytics; big data; human resource information systems

INTRODUCTION

Analytics is the discipline, which has developed at the intersection of engineering, computer science, decision-making and quantitative methods to organise, analyse and make sense of the increasing amounts of data being generated by contemporary societies (Mortensen *et al.*, 2015). Analytics has been described as a 'must have' capability for the HR profession, a tool for creating value from people and a pathway to broadening the strategic influence of the HR function (CIPD, 2013). The central argument of this article is that the development of HR analytics is being hampered by a lack of understanding of analytical thinking by the HR profession. This problem is compounded by the HR analytics industry, which is largely based around products and services, which too often fail to provide the tools for HR to create and capture the strategic value of HR data. Unless the HR profession wises up to both the potential and pitfalls of analytics, we contend that HR analytics is likely to have a number of negative consequences for the HR profession itself, for workers and for organisations. Specifically, there is a risk that analytics will further embed finance and engineering perspectives on people management at boardroom level in ways that will restrict the strategic influence of the HR profession. It may also damage the quality of working life and employee well-being, without delivering sustainable competitive advantage to the organisations that adopt it. This argument is a deliberately provocative one. It is based on a careful reading of the literature combined with what we have learnt from engagement with HR and analytics professionals rather than on a carefully constructed programme of academic research. When we discuss analytics with HR professionals with an interest in the subject, we hear many of the themes and concerns that this article raises being echoed

back at us. We hope that by being provocative, we can stimulate research that will point to a better way forward.

The rest of the article is organised as follows. Recent interest in HR analytics reflects growing interest in 'big data'. We therefore begin by defining what is meant by data analytics and big data as they relate to HR. Second, we offer an overview of academic thinking on HR analytics and sketch its potential contribution. Third, we argue that these ideas are not being adopted because of failings on the part of the HR profession combined with limitations in human resources information systems (HRIS) and significant problems with the analytics industry as it is currently constituted. Taken together, these problems and failings are likely to prevent the promise of HR analytics being realised and will lead to a number of negative consequences. Finally, we set out alternatives and argue that industry/university collaborations offer a productive way forward.

DEFINING BIG DATA AND HR ANALYTICS

According to one heavily cited industry report, big data is anything too large for typical database tools to be able to capture, store, manage and analyse – a necessarily subjective and flexible definition, which ranges from 'a few dozen terabytes to multiple petabytes' (Manyika, *et al.* 2011: 1).¹ A recent academic positioning piece has attempted to move the definition away from the size of the data to its 'smartness', *i.e.* the extent to which it is able to provide the material to conduct fine-grained analysis that successfully explains and predicts behaviour and outcomes (George *et al.*, 2014). The latter definition would encompass data held on existing HRIS: small by the standards of large unstructured data, but big by the standards of the quantitative data sets used in academic social science and able to generate 'smart' insights by virtue of the longitudinal nature of the data (Smeyers, 2015). By contrast, the former definition would focus exclusively on unstructured data, including email content, communication through social networks, web searches, digital images and video footage, and location data from smartphones and other electronic devices. Therefore, in practical terms, analytics involves both traditional relational database and spreadsheet-based analysis, new forms of database software that allow very large quantities of data to be stored and organised more efficiently and new techniques for representing and understanding data through visualisation.

More specifically, data held in HRIS typically composed of information on the workers who are hired (employment history, skills and competencies, formal educational qualifications and demographic information) and on those applicants that were not hired.² Once a worker is employed by a firm, data on hours worked and pay are collected and stored routinely. Depending on the job role, there may also be information on the performance of workers (sales made, hours billed to clients, measures of individual output, etc.). Additionally, there are a variety of 'soft' performance data that might be collected from appraisal and performance management systems, along with information on training and development that the worker has experienced, information on grievances, capability and disciplinary cases, dispute resolution, internal communications, participation schemes and staff attitudes surveys. Historically, such data have been held in separate pieces of software designed to carry out different HR processes (Parry, 2011), but increasingly, they are being gathered together and held in cloud-based data warehouses as organisations invest in upgrading HRIS.

Conceivably, these data could be combined with 'bigger' data on what a worker does (location data from mobile phones, Internet browsing histories, electronic calendars and other handheld electronic devices used in production or service delivery), who they communicate with (email and phone records and online collaborative tools) and what they communicate

about (the content of email, instant messenger conversations and SMS messages, and recordings of interactions with clients). Scattered blog posts provide hints of what might be possible with big data analysis using these types of data: extracting information on mood and morale from large bodies of email messages, mapping social networks and ties within organisations based on electronic records of communications, using geo-location data from mobile devices to gain a better understanding of what employees do and how they interact with one another (Haak, 2014). However, the technical means to integrate, organise and analyse data held in conventional HRIS with data from these larger unstructured sources are as yet not well established. There are also significant issues of privacy, consent and ethics to address when storing and analysing HR data.

Nevertheless, while the technology to more fully exploit big data as it relates to HR develops, there is still much that can be achieved with existing relational data held on HRIS. Indeed, making better use of this data to create and capture value is a necessary prerequisite to the more advanced forms of big data analysis that are in development. Rasmussen and Ulrich (2015) cite two examples of sophisticated HR analytics projects, in an offshore drilling company, which have provided a significant boost to business performance. Firstly, HR analytics was used to establish a relationship between leadership quality and lower turnover levels, which resulted in higher levels of operator competence, which in turn fed through to fewer accidents, less maintenance time and higher customer satisfaction. Secondly, analytics was used to demonstrate the significant benefits the business derived from the company's graduate training programme; the programme was doubled in size as a result. Sparrow *et al.* (2015) cite the example of how Tesco applied the analytics tools developed to understand its customers to better understand its workforce and how McDonalds was able to identify how staff demographics, management behaviours and employee attitudes interacted to optimise restaurant performance. The key questions are how can analytics be used to create, capture, leverage and protect value from HR data and how can existing, essentially descriptive HR analytics programmes evolve to focus on measuring and modelling the strategic impact of human capital inputs so creating better management decision tools (Boudreau and Lawler, 2015a, 2015b)?

THEORISING HR ANALYTICS

The development of academic theory and research into HR analytics over the last 15 years suggests a number of key themes and lessons, which HR professionals should heed. The four points that follow represent a necessarily brief distillation of a large and growing literature on this subject (a representative slice of this literature would include Fitz Enz, 2000, 2009, 2010; Boudreau and Ramstad, 2005, 2006, 2007; Davenport *et al.*, 2010; Boudreau and Jesuthasan, 2011; and Cascio and Boudreau, 2011). First, HR professionals need to develop a strategic understanding of how people (human capital) contribute to the success of their organisation. If a strategy is to create, capture, leverage and protect value (Sparrow *et al.*, 2015), then it needs to be something that is unique to the organisation rather than a generic strategy (Boudreau and Ramstad, 2007). This level of strategic insight is essential if senior HR leaders are to persuade an organisations leadership team to develop HR analytics capabilities.

Second, analytics need to be rooted in a keen understanding of data and the context in which it is collected if it is to generate meaningful insight (what Boudreau and Jesuthasan (2011) call logic-driven analytics). This then allows for the generation of meaningful metrics, which allow the costs and benefits of different HR strategies and methods to be measured and modelled. Cascio and Boudreau (2011) suggest a number of specific techniques, drawing on accounting and operational management tools to analyse and make sense of the metrics.

Third, these metrics and tools allow key 'talent segments', those groups of employees whose performance makes the most strategic difference to the business and its performance, to be identified (Boudreau and Jesuthasan, 2011). Fourth and closely related to the third point, data-driven decision-making then follows from careful empirical analysis using advanced statistical and econometric techniques that move beyond the analysis of correlation between variables to use experiments and quasi-experiments to identify how human capital inputs affect the performance of the organisation. Changes follow when analytics show that a particular policy or approach brings about improvements in performance, and that there is a significant return on improved performance. Analytics capabilities can thereby be focused on optimising the performance of key talent segments and ensuring that the organisation can adequately resource the talent it needs in the future (*e.g.* Boudreau and Jesuthasan, 2011; Cascio and Boudreau, 2011).

If there is a criticism to be levelled at this literature, it is that it has focused on the normative question of what should be done rather than the interpretive and analytical questions of how it can be done, with what results in what contexts? Even when it is evident that academics are engaging in praxis in partnership with organisations developing HR analytics programmes, the details of this praxis remain hidden, presumably for reasons of commercial confidentiality. As a result, our experience suggests that HR practitioners who have engaged with this literature are enthused by its ideas, but feel no better informed about how to put them into practice than they were before they read it. This contributes to a situation where, despite the promise, successful strategic HR analytics projects appear to be few and far between. Although many organisations have begun to engage with HR data and analytics, most have not progressed beyond operational reporting. There is little evidence of the strategic use of HR analytics (Parry and Tyson, 2011; CAHRS 2014a, 2014b; Rasmussen and Ulrich, 2015). In the next section, we ask why this is.

WHAT ARE THE BARRIERS TO SUCCESSFUL HR ANALYTICS ADOPTION?

The central problem is that in the main, the ideas about HR data and analytics set out in the previous section have not penetrated the thinking of much of the HR profession. Many HR professionals are sceptical because they question whether people can be reduced to metrics. Where these ideas have penetrated HR thinking, there remains the problem of praxis, the solution to which is not well understood in HR circles. According to the Chartered Institute for Personnel and Development, the HR function lacks the skills, knowledge and insight to ask the right questions of the HR data they have at their disposal (CIPD, 2013; see also Rasmussen and Ulrich, 2015). Even when HR does have good ideas about how to develop analytics, the relatively peripheral position of HR within the organisational hierarchy may prevent the project from being able to mobilise the support to go forward, or to get the results of analysis acted upon (Smeyers, 2015). In relation to this, there may be insufficient data to ask the right questions. Silo mentalities within organisations prevent HR-related data being combined with data on other determinants of productivity and performance, so it is often hard to build analytical models that examine the role of HR-related factors while controlling for other relevant factors. These weaknesses in the HR profession are compounded by the analytics industry itself. The way in which HRIS are promoted and sold contributes to the fog and confusion around HR analytics. To understand why this is, it is necessary to examine this industry and the products it offers.

The 'integrated talent management suite' is the latest development in HRIS. The global market for this sort of product was estimated to be \$6 bn in 2014 (Bersin, 2014). The product

market is dominated by a handful of key players: Oracle, with the Taleo talent management suite, IBM, which has the Kenexa HR software brand and SAP with SuccessFactors, and Workday. All offer specialist talent management/HRIS software, which brings together data from a range of existing HR-related databases, originally developed for automating separate HR processes, into a single cloud-based data warehouse. These software packages also have user-friendly, employee-facing graphical user interfaces, which are designed to assist career planning, performance management, learning enrolments and knowledge sharing. Such software typically integrates with other enterprise resource planning software modules covering areas like finance, accounting, supply chains and logistics, customer relationship management and manufacturing management. The primary purpose of this type of HRIS is to improve HR processes and operations by making it easier and quicker to access and understand key HR and people data. However, all the major integrated talent management suites also include analytics modules, which are marketed as a key benefit in comparison with older HRIS systems.

The major management consultancies have all developed lines of business that sell organisations the skills and know-how to implement integrated talent management suites. Usually, a firm's HRIS use is benchmarked against that of previous clients of the consultancy (*i.e.* its competitors), and on this basis, a new IT strategy is developed and proposed. The consultancy recommends the software and hardware products, which would best meet the strategic aims. It then oversees the installation and provides training in how to use the product. This will usually involve the customisation of the software to what the consultancy thinks the needs of the firm are, through the creation of database queries and dashboards (*e.g.* Oracle, 2011; Grubb and Marson, 2015). Developing queries and dashboards, which match the functionality of previous 'legacy' HRIS systems based on different software and hardware products, can add considerably to the costs and time taken to implement new HRIS. This makes migration time consuming and expensive (CAHRS, 2014a, 2014b).

What, from a strategic HR perspective, is the problem with this type of software? Rather than providing strategic and predictive analytics that allow organisations to ask and answer big questions about how value can be created, captured and leveraged, HRIS typically provide answers to a more limited set of questions focused on operational reporting. These questions are not without value. Reporting on training and competencies can ensure legal compliance when firms operate in complex regulatory environments. There is evidence that in organisational contexts where individual performance can be measured and rewarded through performance-related pay, standard dashboards reporting key performance indicators can result in impressive performance improvements. However, outside of these contexts, there is little to suggest that this form of analytics improves performance (Aral *et al.*, 2012). The consultancy-driven approach to implementation may also be problematic, given that consultancy activity is often directed towards selling products rather than solving client problems (Sturdy, 2011). The procurement processes through which organisations engage consultants' services typically result in the transfer of a generic 'best practice' approach rather than deep engagement with the organisation and its needs (O'Mahoney *et al.*, 2013).

In short, the theories of HR analytics described in the previous section stress that much of the value of HR data is realised by using it to answer strategic questions about how people create value for the organisation, so that value can be captured and leveraged. However, the analytics modules of HRIS software packages as they are typically sold and implemented do not have the capacity to perform this sort of analysis, which typically requires multivariate longitudinal modelling. Whether they could have the capacity for this sort of analysis is moot, the way in which analytics knowledge is commoditised and sold means that the value that

could be realised from bringing data and software together is missed (Sparrow *et al.*, 2015). The net result of these problems is that even large multinational organisations that have made significant investments in HR analytics, and considerable progress in embedding analytics in other areas of businesses report that their HR analytics programmes have not progressed beyond the reporting of historical information. Consequently, many firms have been frustrated in their attempts to develop forward-looking strategic analysis, while having little idea about how to incorporate big data into their HR analytics programmes (CAHRS, 2014a, 2014b).

Despite these limitations, there is also a growing literature aimed at HR practitioners, which highlights the potential for this software to revolutionise the HR function, and in doing so the performance of organisations (e.g. Fink, 2010; Oracle, 2011; Douthit and Mondore, 2014; HBR, 2014; Bersin, 2015a, 2015b). These accounts typically share two key properties. First, they are written (mainly) by authors trying to sell analytics capabilities. Second, although they claim that the introduction of new HRIS with analytics capabilities will bring big benefits to organisations, the evidence they provide in support of this claim is at best vague (Rasmussen and Ulrich, 2015). There is a strong element of faddishness to this literature. For example, in a recent blog post, Josh Bersin, the man behind Deloitte's HR research/consultancy arm argues that existing talent management software is already out of date because it was developed to tackle the problems of the last decade, the 'war for talent' and not the current issues facing large corporations, 'engagement, empowerment and environment'. This change in the nature of the challenge facing business has led to an 'epic shift' from 'talent to people', part of the solution which Bersin offers being the procurement of more software to undertake tasks like 'real-time employee engagement monitoring' (Bersin, 2015b).

To turn a critical lens on this type of argument, the process at work seems to be that some firms in specific industries experience a real HR-related problem (US tech firms struggle to hire and retain suitably qualified engineers). This specific problem is re-imagined as a general problem facing all large corporations. An expensive piece of software is developed, which is held up as the solution to the problem. The solution does not work in its own terms because it does not have the capabilities to solve the problem that it was purportedly developed to deal with; rather, it was an engineering-led project to build something big and impressive sounding without sufficient thought being given to what it was being built for. Nevertheless, mimetic isomorphism (DiMaggio and Powell, 1983) driven by aggressive sales campaigns from the large IT companies and consultancies leads to widespread adoption. Disappointment with the results is blamed not on the weaknesses of the product but on the shifting corporate environment, and new products supposedly to address these new environmental challenges are developed and sold. As the new products are built on the shaky foundations of the previous products, and suffer from similar limitations, the results are similarly disappointing. Further, the generic nature of the products being sold and the use of strategies and practices based on industry benchmarks must following the logic of resource-based theory (which highlights the importance of unique and inimitable capabilities), prevent such HRIS becoming a source of inimitable competitive advantage (Marler, 2009). This literature just adds to the fog of confusion through which many in the HR profession approach the subject of HR analytics and contributes to an environment in which organisations are failing to make investments in developing HR analytics capabilities.

WHAT IS TO BE DONE?

In the context of HR and data analytics, one answer to Lenin's famous question could simply be 'nothing'. So what if large corporations want to waste their shareholders' money on expensive

proprietary analytics packages which do not deliver on what they promise to do? So what if most corporate HR functions lack the skills and inclination to engage with the analytics agenda? Eventually, through a process of trial and error, some organisations will succeed in developing effective HR analytics programmes. If HR analytics really is a source of competitive advantage, these organisations will do better than their competitors, who will eventually work out how to imitate their success. Consultants will then commodify and sell this knowledge until its use becomes commonplace. Even if the HR function does not engage with this process, or engages in ways which are ultimately unsuccessful, it does not matter so the argument goes, because smart people in corporate analytics functions will work out for themselves the importance of including HR-related variables in their modelling. In the end, HR analytics will be incorporated into end-to-end business analytics through an 'outside-in' process (Rasmussen and Ulrich, 2015).

This is the wrong answer to the question. If HR is not fully involved in the modelling process, there is significantly greater scope for models to be constructed in a way which fundamentally misunderstands the nature of human capital inputs into the processes of production and service delivery. Instead of recognising the flexibility of labour; that productivity and performance change with skills, motivation and the design of people-process interactions, labour is modelled as a fixed cost that needs to be controlled. Unless analytics is embedded in a full and comprehensive analytical model, the more limited information available in dashboard formats may be misinterpreted by operational and financial managers with a limited patience for or understanding of HR. Further, this process of modelling and creating dashboards and traffic lights is not value neutral but depends on dominant paradigms and perspectives within accounting and operations management, which themselves reflect ideology, politics and power (Cooper and Hopper, 2010).

This is not just a hypothetical problem. There are already plenty of examples of how modelling and algorithm-based approaches to people management are driving down job quality and damaging performance. One of the better documented examples comes from the retail sector. All large retailers use workforce planning software to plan optimum staffing levels in their stores. Such software typically assumes labour is a cost to be minimised (Ton, 2009). Widespread adoption of this software has typically led retailers to reduce staffing levels, as stores with higher labour costs are portrayed by the modelling as damaging profitability. However, the assumption that labour was a cost to be controlled fails to take into account that the quality of labour input has a bearing on performance outcomes. Reducing staffing costs by employing fewer people can also drive down the quality of labour input as workers are spread more thinly, thus do not have the time to ensure that displays are organised attractively, stock is kept moving onto shelves or that customers received help when requested. This process is also bad for workers, who lose their jobs or see cuts in their income as hours are cut back. In the US, the consequences for workers can be particularly severe, because the approach can be used to ensure that workers are kept under the hours thresholds that would allow them to qualify for expensive employee benefits like health insurance. In some cases, the experience of work becomes increasingly dystopian as worker behaviour and interactions are controlled in real time by algorithms that require maximum effort and remove worker autonomy and control (Haque, 2015).

In contrast to the accepted way of doing things, Ton's research found that increasing staffing levels actually increased profitability because the boost to sales from higher quality labour inputs was greater than the additional labour costs (Ton, 2009). It is precisely this sort of experimentation that HR analytics should facilitate and encourage (for example, Cascio and Boudreau (2011) who call for the use of experiments and quasi-experiments to identify the

causes and returns on performance improvement). However, the use of proprietary analytics software appears to have the opposite effect. HR and line managers who lack the skills and knowledge to challenge the assumptions underpinning the dashboards and reports unthinkingly implement the 'optimal solution' provided by the analytics software, while the developers of the models underpinning the analytics software do not understand enough about labour in the context of the organisations they are working with to realise that the assumptions of their models are flawed. Strategic input from HR is then unnecessary if staffing strategy is dictated by an analytics dashboard flashing red, prescribing cuts in the headcount and associated HR policies. Instead of HR influence running from the outside of the organisation to its centre through the adoption of end-to-end analytics programmes (dubbed 'outside-in' by Rasmussen and Ulrich, 2015), HR is simply left outside.

Imagining alternatives

If the HR profession want to gain insight into what effective HR analytics looks like, the existing literature provides insight into the intuition behind logic-driven HR analytics and provide accounts of the successful deployment of it. However, with the partial exceptions of Cascio and Boudreau (2011) and Rasmussen and Ulrich (2015), this literature is rather light on the praxis of HR analytics. This matters, because HR analytics involves complex multistage projects requiring question formulation, research design, data organisation, and statistical and econometric modelling of differing levels of complexity and rigour. This complex process then needs to be translated back into a simple story that decision makers within the organisation can understand, so that it becomes a guide to future management actions. Without a focus on praxis, the fog and confusion around analytics is a block to action.

Can academics do more to burn through this fog and assist the HR profession to upskill to a new world of strategic analytics-driven HR? Opinion is divided on this question. In a recent article, Bersin (2015a) reported evidence of companies drawing on the expertise of PhDs in occupational psychology, engineering and statistics in order to take their analytics activity to the next level. Boudreau and Jesuthasan (2011), Cascio and Boudreau (2011) and Sparrow *et al.* (2015) all reported on academic involvement in corporate analytics projects. By contrast, Rasmussen and Ulrich (2015) are rather dismissive of the idea that corporate analytics teams should draw on academic expertise, because they do not think academics have a deep enough understanding of the business to ask the right questions, and will waste time and resources developing over-specified models in answer to largely academic questions with little practical application.

We believe that academics do have an important role to play. What is missing from current analytics software is the capability to build longitudinal, multivariate econometric models of the sort needed to conduct 'end-to-end' analytics. Our own conversations with HR analytics professionals in organisations that have made significant progress in bridging the analytics/HR gap suggests that even these organisations do not possess skills or expertise in more advanced statistical and econometric techniques. This type of analysis is necessary to disentangle correlation from causality through analysis of experiments and quasi-experiments (Cascio and Boudreau, 2011). Standard HRIS analytics packages do not have the flexibility or power to conduct this sort of multivariate longitudinal analysis, which requires specialist statistical or econometric software like R or Stata (Douthit and Mondore, 2014). Academic expertise can contribute here, both because academics can supply missing expertise and because they understand both quantitative analytics and HR, so are well placed to help bridge gaps in understanding between HR professionals and organisation-based data scientists.

However, the impact of academic engagement will be limited if academic researchers do not do a better job of elucidating the praxis of HR analytics. Greater engagement with public and third-sector organisations may facilitate this, because scope to disseminate research findings will not be limited by the requirements of confidentiality that commercial organisations may insist on.

Academic researchers also need to confront ontological and methodological issues if such collaborations are to prove fruitful. The hyper-positivist ontological framework that has come to dominate much of industrial psychology and labour economics may be a barrier to effective academic/practitioner collaborations. This approach is directed at prediction and control in supposedly closed systems rather than developing causal understanding of real-world open systems. The theoretically derived measures included in hyper-positivist models are often over-abstracted from the social context of the organisation so that meaning is obscured, while researchers pay insufficient attention to context in explaining results (Godard, 2014). The approach of critical realism (*e.g.* Downward, 2000) or realist evaluation, asking the questions of what works for whom in what circumstances (Pawson and Tilley, 1997), is more likely to yield results and insights of value. Indeed, the approach of realist evaluation closely mirrors the approach to HR analytics advocated by Rasmussen and Ulrich (2015) and Boudreau and Jesuthasan's (2011) 'logic-driven analytics'.

The engagement of HR and related academics with HR analytics and big data through research and teaching also offers possibilities for advancing academic understanding of the relationship between HR and organisational performance. Recent reviews of this research agenda have stressed the need for longitudinal quantitative analysis (Guest, 2011) conducted on large-scale, expensive and ambitious sample surveys (Wall and Wood, 2005). Engagement with organisations' own data on HR and performance may allow for more fine-grained and convincing causal analysis without the need for such expensive data collection. Such data both challenges the traditional jurisdiction of academic social science and offers an opportunity for social science methods and knowledge to advance in fruitful directions (Savage and Burrows, 2007). In an era of declining research funding and a declining willingness on the part of research subjects to participate in sample surveys, it may be the only way of advancing understanding of the HR–performance relationship.

CONCLUSIONS

The HR function is lagging behind other functional areas of management in the adoption of analytics technology and in the analysis of big data. Contrary to optimistic accounts from industry sources, we can see little evidence that HR analytics is developing into a 'must have capability', which will ensure HR's future as a strategic management function. Many in the HR profession do not understand analytics or big data, while analytics teams do not understand HR. As a result, the costly analytics capabilities provided by the latest forms of HRIS are failing to deliver strategic HR analytics capabilities. A different approach to HR analytics is needed, which starts with the question of how HR data can be used to create, capture, leverage and protect value, then seeks to develop answers to these questions through more advanced forms of longitudinal multivariate modelling. The results of this may then be used to inform HR practice and to develop meaningful day-to-day metrics, measures and dashboards within conventional HRIS analytics packages. Academics could play a constructive role in these developments, but could also do more to elucidate the praxis of strategic HR analytics. However, unless HR professionals upgrade their skills and knowledge to become champions of this new approach, the existing forms of HR analytics are likely to seal the exclusion of

HR from strategic, board-level influence while doing little to benefit organisations and actively damaging the interests of employees.

Notes

1. A note on the terminology of data storage. A single binary digit (0 or 1) is a bit. A byte is made up of 8 bits. A gigabyte is made up of 1,073,741,824 bytes or 8,589,934,592 bits. An entry level iPhone has a hard drive capable of storing 16 gigabytes of data. A terabyte is 1024 gigabytes (or the storage capacity of 64 entry level iPhones). A petabyte is 1024 terabytes (or the storage capacity of 65,536 entry level iPhones).
2. Laws on data protection may in practice limit the extent of data that are stored, and the duration for which they are stored. Care is needed to ensure that HR analytics programmes comply with privacy and data protection laws.

REFERENCES

- Aral, S., Brynjolfsson, E. and Wu, L. (2012). 'Three-way complementarities: performance pay, human resource analytics, and information technology'. *Management Science*, 58: 5, 913–931.
- Bersin (2014). *Talent Management for the Global Workforce: The Market for Talent Management Systems 2014*, Oakland, CA: Bersin by Deloitte.
- Bersin, J. (2015a). 'The geeks arrive in HR: people analytics is here.' *Forbes Magazine*. Available at <http://www.forbes.com/sites/joshbersin/2015/02/01/geeks-arrive-in-hr-people-analytics-is-here/> (accessed 13 February 2015).
- Bersin, J. (2015b). 'Why people management is replacing talent management.' *Joshbersin.com*. Available at http://joshbersin.com/2015/01/why-people-management-is-replacing-talent-management/#disqus_thread (accessed 13 February 2015).
- Boudreau, J. and Jesuthasan, R. (2011). *Transformative HR: How Great Companies Use Evidence Based Change for Sustainable Competitive Advantage*, San Francisco, CA: Jossey Bass.
- Boudreau, J. and Lawler, E. (2015a). 'Making talent analytics and reporting into a decision science', Working paper, Centre for Effective Organisations, University of Southern California.
- Boudreau, J. and Lawler, E. (2015b). Talent analytics measurement and reporting: building a decision science or merely tracking activity? Working paper, Centre for Effective Organisations, University of Southern California.
- Boudreau, J. and Ramstad, P. (2005). 'Talentship and the evolution of human resource management: from professional practices to strategic decision science'. *Human Resource Planning*, 28: 2, 17–26.
- Boudreau, J. and Ramstad, P. (2006). 'Talentship and HR measurement and analysis: from ROI to strategic human resource planning'. *Human Resource Planning*, 29: 1, 25–33.
- Boudreau, J. and Ramstad, P. (2007). *Beyond HR: The New Science of Human Capital*, Boston, MA: HBR Press.
- CAHRS (2014a). CAHRS Working Group on HR analytics summary report part 1. Ithaca NY: Cornell University Centre for Advances Human Resources. Available at <http://cahrs.ilr.cornell.edu/CentersofExcellence/data.aspx?n=HR%20Analytics/Metrics#Research> (accessed 31 October 2014).
- CAHRS (2014b). CAHRS Working Group on HR analytics summary report part 2. Ithaca NY: Cornell University Centre for Advances Human Resources. Available at <http://cahrs.ilr.cornell.edu/CentersofExcellence/data.aspx?n=HR%20Analytics/Metrics#Research> (accessed 31 October 2014).
- Cascio, W. and Boudreau, J. (2011). *Investing in People: The Financial Impact of Human Resources Initiatives*, 2nd edn, Upper Saddle NJ: Pearson.
- CIPD (2013). *Talent Analytics and Big Data – The Challenge for HR*, London: Chartered Institute for Personnel and Development.
- Cooper, D. and Hopper, T. (2010). *Debating Coal Closures: Economic Calculation in the Coal Dispute 1984–1985*, Cambridge: Cambridge University Press.
- Davenport, T., Harris, J. and Shapiro, J. (2010). 'Competing on talent analytics'. *Harvard Business Review*, 88: 10, 52–58.

- DiMaggio, D. and Powell, W. (1983). 'The iron cage revisited: institutional isomorphism and collective rationality in organizational fields'. *American Sociological Review*, 48: 1, 147–160.
- Douthit, S. and Mondore, S. (2014). 'Creating a business-focused HR function with analytics and integrated talent management'. *People and Strategy*, 36: 4, 16–21.
- Downward, P. (2000). 'A realistic evaluation of post-Keynesian pricing theory'. *Cambridge Journal of Economics*, 24: 2, 211–224.
- Fink, A. (2010). 'New trends in human capital research and analytics'. *People and Strategy*, 33: 2, 15–21.
- Fitz Enz, J. (2000). *The Return on Investment in Human Capital: Measuring the Economic Value of Employee Performance*, New York: American Management Association.
- Fitz Enz, J. (2009). *The ROI of Human Capital*, New York: AMACOM.
- Fitz Enz, J. (2010). *The New HR Analytics*, New York: AMACOM.
- George, G., Haas, M. and Pentland, A. (2014). 'Big data and management'. *Academy of Management Journal*, 57: 2, 321–326.
- Godard, J. (2014). 'The psychologisation of employment relations?'. *Human Resource Management Journal*, 24: 1, 1–18.
- Grubb, A. and Marson, L. (2015). *SuccessFactors™ with SAP ERP HCM*, Bonn: Galileo Press.
- Guest, D. (2011). 'Human resource management and performance: still searching for some answers'. *Human Resource Management Journal*, 21: 1, 3–13.
- Haak, T. (2014). 'Escaped from the HR analytics lab', blog post. Available at <http://hrtrendinstitute.com/2014/10/21/escaped-from-the-hr-analytics-lab/> (accessed 27 November 2014).
- Haque, U. (2015). 'The Asshole Factory'. Available at <https://medium.com/bad-words/the-asshole-factory-71ff808d887c> (accessed 17 November 2015).
- HBR (2014). HR joins the analytics revolution. Harvard Business Review Reports. Available at https://hbr.org/resources/pdfs/comm/visier/18765_HBR_Visier_Report_July2014.pdf (accessed 27 February 2015).
- Manyika, J., Chui, M., Brown, B., Bughin, J., Dobbs, R., Roxburgh, C. and Byers, A. (2011). *Big data: the next frontier for innovation, competition and productivity*, McKinsey & Company.
- Marler, J. (2009). 'Making human resources strategic by going to the Net: reality or myth?'. *The International Journal of Human Resource Management*, 20: 3, 515–527.
- Mortensen, M., Doherty, N. and Robinson, S. (2015). 'Operational research from taylorism to terabytes: a research agenda for the analytics age'. *European Journal of Operational Research*, 241: 3, 583–595.
- O'Mahoney, J., Heusinkveld, S. and Wright, C. (2013). 'Commodifying the commodifiers: the impact of procurement on management knowledge'. *Journal of Management Studies*, 50: 2, 204–235.
- Oracle (2011). HR Analytics: Driving Return on Human Capital Investment. Available at <http://www.oracle.com/us/solutions/ent-performance-bi/045039.pdf> (accessed on 20 February 2015).
- Parry, E. (2011). 'An examination of e-HRM as a means to increase the value of the HR function'. *The International Journal of Human Resource Management*, 22: 5, 1146–1162.
- Parry, E. and Tyson, S. (2011). 'Desired goals and actual outcomes of e-HRM'. *Human Resource Management Journal*, 21: 3, 335–354.
- Pawson, R. and Tilley, N. (1997). *Realistic Evaluation*, London: Sage.
- Rasmussen, T. and Ulrich, D. (2015). 'Learning from practice: how HR analytics avoids becoming a fad'. *Organizational Dynamics*, 44: 3, 236–242.
- Savage, M. and Burrows, R. (2007). 'The coming crisis of empirical sociology'. *Sociology*, 41: 5, 885–889.
- Smeyers, L. (2015). *What We Learned about HR Analytics in 2014 – part 2*. Available at <http://www.inostix.com/blog/en/what-we-learned-about-hr-analytics-in-2014-part-2/> (accessed 14 May 2015).
- Sparrow, P., Hird, M. and Cooper, C. (2015). *Do We Need HR? Repositioning People Management for Success*, Basingstoke: Palgrave Macmillan.
- Sturdy, A. (2011). 'Consultancy's consequences? A critical assessment of management consultancy's impact on management'. *British Journal of Management*, 22: 3, 517–530.
- Ton, Z. (2009). 'The effect of labor on profitability: the role of quality', Harvard Business School Working Paper 09-040, Boston, MA: Harvard Business School.
- Wall, T. and Wood, S. (2005). 'The romance of human resource management and business performance, and the case for big science'. *Human Relations*, 58: 4, 429–462.