People analytics—A scoping review of conceptual boundaries and value propositions

Aizhan Tursunbayeva[a,b,*], Stefano Di Lauro[c], Claudia Pagliari[a]

[a] eHealth Research Group, Usher Institute of Population Health Sciences and Informatics, The University of Edinburgh, Teviot Place, Edinburgh, EH8 9AG, UK
[b] University of Molise, Via Francesco De Sanctis, 1, 86100, Campobasso, Italy
[c] University of Naples Federico II, Corso Umberto I, 40, 80138, Naples, Italy

ABSTRACT

This mixed-method 'scoping review' mapped the emergence of the term People Analytics (PA), the value propositions offered by vendors of PA tools and services and the PA skillsets being sought by professionals. Analysis of academic research and online search traffic since 2002 revealed changes in the relative trajectory of PA and conceptually related terms over the past fifteen years, indicating both the re-branding of similar innovations and a differentiation of priorities and communities of practice. The market in commercial PA tools and services is diverse, offering numerous functional and strategic benefits, although published evidence of these outcomes remains sparse. Companies marketing PA systems and services emphasise benefits to employers more than to personnel. Across the sources examined, including specialised online courses, PA was largely aligned with HRM, however its development reflects the shifting focus of HR departments from supporting functional to strategic organisational requirements. Consideration of ethical issues was largely absent.

1. Introduction

In an increasingly digitised society, interest in the use of so called big (and small) data has never been greater. Data analytic techniques, of varying sophistication, are being used to understand social phenomena, evaluate policies, tailor consumer marketing, predict voting behaviour, enable precision medicine and a host of other real-world applications (Raguseo, 2018). Understanding and optimising the workforce is a key part of this trend (Edwards & Edwards, 2016; Sullivan, 2013). In many ways, this echoes nineteenth century notions of organisations as machines, to be fine-tuned to maximise outputs and minimise waste, with employees seen as components to be stratified, incentivised, deployed and shed for maximum effectiveness. Although most organisational theorists and leaders now recognise organisations as complex adaptive socio-technical systems (Schneider & Somers, 2006) interest in using data analytics and visualisation tools to render this complexity into a more comprehensible and actionable forms is growing (Gandomi & Haider, 2015).

Within this context, the term 'People Analytics' (PA) has been appearing with greater frequency in executive leadership and Human Resources Management (HRM) circles (Deloitte, 2017). PA promises to help organisations understand their workforce as a whole, as departments or work groups, and as individuals, by making data about employee attributes, behaviour and performance more accessible, interpretable and actionable (Pape, 2016). This includes the use of information systems, visualisation tools and predictive analytics, underpinned by employee profiling and performance data.

The association of PA with HRM is obvious, given the emphasis on optimising recruitment, retention, assessment, promotion, remuneration, turnover and other aspects of human capital management. The Information Technology (IT) and cyber-security professions are also stakeholders, since data analytics are essential for red-flagging corporate threats, such as the misuse of organisational information, intellectual property theft or fraud (Guenole, Ferrar, & Feinzig, 2017). While these issues are important for all organisations, the potential value of automated techniques is magnified in those which are large and distributed, since traditional information needs and oversight mechanisms may exceed conventional HRM capabilities. Despite this potential, PA is still not well understood in the business or academic communities (Marler & Boudreau, 2017) beyond HR innovators, or in high-risk sectors such as defence and financial services, where such practices are often shrouded in commercial secrecy.

This scoping review aimed, through an analysis of online sources and academic literature, to better understand the nature, usage and potential of PA, as well as issues arising in the field. The specific objectives were to examine 1) the emergence of the PA concept over time

---

and its relationship with other HR-related concepts 2) the contexts in which PA is being used; 3) the value propositions advanced by providers of PA products and services; and 4) training courses currently aimed at PA practitioners. The review was prompted by findings of a recent systematic literature review on HR Information Systems (HRIS) in healthcare, which highlighted the importance of HR data for effective management and organisational efficiency (Tursunbayeva, Bunduchi, Franco, & Pagliari, 2016). It complements a recent review of the academic research literature on HR Analytics (Marler & Boudreau, 2017) by extending the analysis to a wider set of knowledge types. It also addresses calls from within the industry for "independent scientific research" on PA (e.g. Julia Howes, quoted in Levenson & Pillans, 2017).

2. Methods

We undertook a quasi-systematic scoping review, adopting an approach originally proposed by Arksey and O'Malley (2005). Unlike systematic reviews aimed at synthesising evidence from evaluative studies (e.g. Tursunbayeva, Franco, & Pagliari, 2017), scoping reviews are often used to examine emerging topics that are poorly understood, where research is at an early stage, or where pertinent knowledge is being generated outside academia. Scoping reviews thus address broad rather than narrow research questions and seek to profile the literature and understand it holistically, rather than to critically appraise the methodological quality of individual studies (Holeman, Cookson, & Pagliari, 2016).

Since PA is an emergent topic it was appropriate to use this broad approach rather than concentrating on a narrow and likely unrepresentative academic research literature and specific and narrow research questions.

Data collection took place in four main phases, which are summarised below, noting the research objectives addressed by each one.

2.1. Mapping the use of PA-related terms online (Addresses objectives 1 and 2)

To inform our literature searches, we first created a draft set of ten keywords *[HR, Human Resource, People, Workforce, Employee, Human Capital, Manpower, Staff, Personnel, Talent],* drawing on the results of the recent systematic evidence review on HRIS in the context of healthcare (Tursunbayeva et al., 2016) and adding the word *"Analytics"* to each of these.

We analysed the prevalence of each of these keyword combinations in online searches, using Google Trends (searched on 10/06/2017), following previous research that uses this free tool to obtain insights on users' Internet search behaviour (e.g. Nuti et al., 2014).

We used additional Google Trends analytics to chart the *countries* in which each search term has been the most popular, as well as to examine the *related terms* used alongside PA in online searches in which PA keywords are included. Open coding (Glaser & Strauss, 1967) was applied to the latter to iteratively sort the results into thematic categories.

2.2. Scoping relevant academic research (Addresses objectives 1 and 2)

Using a subset of 7 core keywords refined after Phase 1 ("HR analytics" OR "Human Capital analytics" OR "Human Resource analytics" OR "People analytics" OR "Talent analytics" OR "Workforce analytics" OR "Employee analytics"), we undertook preliminary searches of the academic literature using the Scopus database (30/07/2017).

To check the *inclusivity* of our search results, the titles of articles judged to be relevant were cross-referenced with those appearing in two benchmark literature sources: Firstly, a recent review of academic research on HR Analytics by Marler and Boudreau (2017) which used similar search terms and shortlisted 14 relevant papers dating from 2004. Secondly, a list of relevant articles informally maintained by the

Human Capital Analytics Group (HCA Group, 2017) of the Copenhagen Business School, encompassing 28 articles dating from 2002 (as of 30/07/2017).

The *disciplinary affiliation* of journals publishing PA research was assessed with reference to their classification in the Scimago Journal Ranking Portal (2017), except for the Scopus articles for which this information was available in the database. Where articles specified *keywords* these were cross-referenced with our seven search terms to identify those most frequently used. Finally, we analysed the *concepts* appearing in article titles and abstracts with reference to a framework by Isson and Harriott (2016) which organizes PA into 7 "pillars" according to its potential impact on: 1. Workforce planning; 2. Sourcing; 3. Acquisition/hiring; 4. Onboarding, culture fit, and engagement; 5. Performance assessment and development and employee lifetime value; 6. Churn and retention; and 7. Wellness, health, and safety.

2.3. Scoping commercial PA tools and services (Addresses objectives 2 and 3)

To identify venders of PA tools and services, we searched for each of our 7 core PA keywords in Google and analysed the first page of results for each one, based on previous studies showing that 91% of searchers check only this page (Van Deursen & van Dijk, 2009). For our analysis we included only the organic results (Ratliff & Rubinfeld, 2014), and omitted paid advertisements. The search was conducted on 30/07/2017.

Vendors identified from this search were first classified according to the *nature of their business*, using a taxonomy, developed by Libert, Beck, and Wind (2016), as Asset Builders; Service Providers; Technology Creators; Network Orchestrators. We then reviewed the narrative in vendors' online promotional material, to identify the specified or implied benefits offered to prospective purchasers (*value proposition*). These were iteratively coded before settling on a refined list of benefit categories.

2.4. Scoping online training courses (Addresses objective 4)

Again, using the 7 keywords refined through Phase 1, we searched the Wikipedia list of massive online open courses (MOOC) by "Notable providers" (Wikipedia, 2017) (Search conducted on 30/07/2017). After examining the openly accessible information describing each course, we extracted those most closely related to PA and attempted to assess their *learning objectives*, insofar as this was possible without enrolling. These were cross-referenced with the "Profile of a Perfect Data Analyst" developed by the Nesta global innovation foundation (2014), which includes: Core skills (Analytical or Technical); Domain and Business Knowledge (Knowledge of the sector, Awareness of business goals and processes); Soft skills (Storytelling and Team-working) and Competencies (Analytics Mindset, Creativity and Curiosity). Available course content was also classified according to Isson and Harriot's 7 PA pillars framework, as described above. Finally, we emailed course developers and asked for the course creation date and attendance statistics.

3. Findings and analysis

3.1. People analytics in online search trends

None of the terms *Manpower Analytics, Personnel Analytics* or *Staff Analytics* were found in Google trends since records began in 2004. Although these terms appear in earlier articles included in a recent systematic review of HRIS (Tursunbayeva et al., 2016), their absence post-2004 suggests that they are no longer in common usage and we therefore decided to exclude them from further analysis. Indeed, these were also not found amongst the search terms or results in Marler and Boudreau's (2017) related review. The relative popularity of online searches for the remaining seven terms is shown in Fig. 1.