The Datafication of Talent: How Technology is Advancing the Science of Human Potential at Work

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Abstract

This article reviews three innovations that not only have the potential to revolutionize the way organizations identify, develop and engage talent, but are also emerging as tools used by practitioners and firms. Specifically, we discuss (a) machine-learning algorithms that can evaluate digital footprints, (b) social sensing technology that can automatically decode verbal and nonverbal behavior to infer personality and emotional states, and (c) gamified assessment tools that focus on enhancing the user-experience in personnel selection. The strengths and limitations of each of these approaches are discussed, and practical and theoretical implications are considered.

Talent management, the division of Human Resources (HR) focused on identifying, developing, and engaging employees to increase organizational effectiveness, is the key human capital challenge of the 21st century [1]. Psychological assessments are a core foundation of effective talent management practices: if you cannot predict and understand human behavior, you will not be able to manage it [2]. Although assessments have been used in employment settings for over a century [3], recent technological advancements have provided a range of novel tools for evaluating employee behavior [4], and their growing adoption suggests that they have the potential to make talent management practices less intuitive, and more evidence-based [5]. This trend is just beginning, is inevitable, and will supplant existing methods. However, most of these emerging methods have yet to be rigorously scrutinized by scientific research [6]. As a recent review indicated, the overarching field of *talent analytics* is still in its infancy, with only 16% of organizations using HR technologies to link the people side of business to critical organizational outputs, and perhaps even fewer making data-driven decisions based on those analytics. As the reviewers concluded: "despite being a very 'hot topic' among HR professionals, a search for peer-reviewed research in listed scholarly journals reveals a strikingly small amount of scholarly scientific research [on talent analytics]" (p.23) [7*].

These conclusions highlight several issues facing HR leaders and academics. First, HR professionals need training so that they can use existing psychological assessments correctly. Second, academics must explore the validity of emerging technologies and practices regarding big data, technology and human potential. Last, in the absence of compelling scientific evidence organizational leaders must resist the hype surrounding big data and the associated, but unsubstantiated claims promising increased effectiveness and performance. Solving these issues

is beyond the scope of this article, however we review three promising innovations within the "datafiction of talent" field to raise awareness regarding their utility, effectiveness and current limitations. It is hoped that by doing so organizations will increase the use of, and benefit from, a data-driven and evidence based approach to identifying and developing talent.

One of the most promising innovations for evaluating work-related talent is the deployment of machine-learning algorithms for translating a person's digital records, such as their social media footprint, into a psychological profile (e.g., personality, cognitive ability and values) [8]. Although ethical and legal constraints have limited the application of this methodology to employee selection and screening [9], there is compelling academic evidence for the validity of digital records as signals of broad individual differences, and decades of research have linked those same individual differences to job performance, leadership potential, and counterproductive work behaviors [10]. For example, meta-analytic studies have shown that the Big Five personality traits account for as much as 50% of the variability in leadership emergence and effectiveness [11], and cognitive ability (which is largely orthogonal to the Big Five) up to 27% [12]. In turn, around half of the measurable variability in traditional measures of the Big Five and cognitive ability have been shown to be accounted for by digital records, such as the virtual groups "liked" by Facebook users [13*]. Facebook data has also been used to infer dark side personality traits, such as psychopathy (manifested in eccentric and negative user content), and narcissism (manifested in self-referential content) [14]. In conjunction with digital identity claims (i.e. Facebook "likes"), individual differences in online language use [15], such as the type and frequency of words used on email, Twitter, or Facebook, are indicative of people's Big

Five personality scores [16], as well as their core values [17], both of which predict elevated levels of person-job fit and employee engagement [18].

For digital records to complement traditional psychometric assessments in the prediction of work-related outcomes, their incremental validity would have to be demonstrated. Nonetheless, it would be mistaken to assume that the utility of digital records depends on this. First, digital records provide more accurate information on people's personality than human observers do [19], and recruiters and hiring managers habitually use social media to "snoop" on candidates' profiles and make inferences about their potential [20]. One study found that nearly 70% of respondents agreed that employers have the right to check their social networking profile when evaluating them [21]. Second, digital records offer a scale advantage that represents a faster and cheaper alternative to traditional selection methods. This is for two reasons: first they do not require candidates to complete an assessment, saving time; second, even if digital tools are no more predictive of work-related outcomes than traditional tools are, assessing more candidates can compensate for less predictive power. Consider an organization that needs to hire 20 people. Let us further consider that the organization uses traditional recruitments methods, such as job board postings, and gets 100 applicants. Further, the organization uses traditional selection methods (e.g., resumes, personality assessments, references, and interviews), with a combined predictive validity of $r = .40$. Now consider a second organization that also needs to hire 20 people. This organization "recruits" applicants via public social media profiles (e.g., LinkedIn) yielding a pool of 100,000 applicants. This organization uses modern selection methods (e.g., data mining) that have a predictive validity of only $r = .20$. Despite the lower predictive validity, the second organization will actually end up hiring a set of employees who are .20 SDs *more*

productive or effective than the first[1]. Many organizations do select people at this scale; Amazon intends to hire 100,000 full time staff in 2017 [22]. In order to address ethical and legal constrains, as well as anonymity concerns [23], firms intending to use digital tools will need to allow candidates to opt-in and have control over their data, grant algorithms permission to assess them, and decide whether or not to share their psychological profiles with potential employers or recruiters [6].

The second innovative method for evaluating talent is the digital interview, whereby 'computer vision' is used to translate interviewees' vocal and nonverbal behaviors into a psychological profile or an estimate of their potential fit for a role (based on the prediction of their future job performance or employee engagement level) [5]. The promise of such technologies is the standardization of the interview process, making it more objective and cost efficient while reducing the impact of interviewer biases [24]. The digital interview was born out of the field of 'social sensing', the automatic capture and analysis of interpersonal behavior using consumer grade audio-visual equipment [25]. Research within this field has found verbal and nonverbal channels of communication (i.e. vocal characteristics, facial expressions & body movements) to be valid predictors of personality traits, often explaining up to 30% of variance [26, 27, 28]. Augmenting human hiring decisions through automated multimodal feature extraction (i.e. visual & voice parameters) from online interviews seems possible and is being trialed in the lab. For instance, a study led by Laurent Son Nguyen found that social sensing technology could explain 29% of the variance in hiring decisions, over and above survey measures of the Big Five and cognitive ability [29*]. Although this study does not question the wealth of validity data surrounding psychometric personality and ability measures, it does demonstrate the potential

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[1] An R simulation demonstrating this can be found at: http://www.rynesherman.com/Selection%20Simulation.R

social sensing technology has for identifying critical interpersonal behaviors that may go otherwise undetected by traditional recruitment tools.

A final innovation in the field of talent identification is gamification, which concerns efforts to make assessments tool more game-like (e.g., engaging, competitive, visually-appealing, etc.) [30]. Although interactive simulations have been used as assessment and selection methods for decades [31], the digital revolution has fueled a proliferation of game-based assessments. There are many reasons why HR practitioners and organizational psychologists should be interested in game-based assessments. First, significant similarities exist between playing online role-playing games and the situations in the workplace. For instance, managing and coordinating virtual "clans" in World of Warcraft requires the ability to cooperate, build teams, lead others, and make effective decisions [32]. Second, given that Self-Determination theory (i.e. the need for autonomy, mastery & relatedness) is predictive of video game preferences [33], game-based assessments may improve person-job fit by increasing the likelihood of employees being placed in jobs that are intrinsically motivating and engaging [34]. Third, test takers prefer playing games. Last, there is considerable overlap between the mental processes needed to win at video games and those that define cognitive ability [35, 36*, 37] suggesting video game-based assessments may offer new ways to measure psychological attributes critical to employee talent, such as fluid intelligence [38], integrity [39] and curiosity [40]. That said, the validity and value of game-based assessments is still hypothetical, has many empirical unknowns and requires scrutiny when used for selection and development. Academics and practitioners should conduct research so the utility of these tools can be compellingly demonstrated.

Although we advocate for the benefits accruing from the datafication of talent, it is also important to consider some limitations and negative consequences of these novel approaches to talent identification. As new tools are developed and begin to be deployed in the workplace, there are three issues pertaining to the employee-employer relationship that must be resolved: a) clear boundaries around data ownership and sharing must be established; b) data privacy and access must be consensual and transparent; and c) data should be used ethically and in a non-discriminatory manner. Although regulatory bodies have already established best practices regarding these issues for the use of traditional psychological assessments, much work remains to be done in order to update these guidelines beyond HR and organization psychology, considering the intersectional nature of data, machine learning & human behavior [41].

To conclude, recent technological developments have provided new alternatives for evaluating workplace talent and potential. Although the relative accuracy of these innovations vis-à-vis traditional selection tools remains to be evaluated, there is no question that they represent a more data-driven and evidence-based approach than human intuition.

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Highlights

1. This article reviews nascent technologies that have the potential to revolutionize HR analytics and the identification of employee talent.

2. We discuss the efficacy of machine learning algorithms, social sensing technology, and gamification, as alternative ways to measure individual differences.

3. We highlight critical opportunities for those who are interested in the advancing the research and practice of this field.