Talent Identification in the Digital World:

New Talent Signals and the Future of HR Assessment

By Dave Winsborough and Tomas Chamorro-Premuzic

Since McKinsey & Company introduced the notion of a war for talent nearly 20 years ago, there has been unprecedented interest in the development, validation, and application of tools for quantifying human potential. Like other forms of warfare, the talent war has spurred a great deal of innovation and competition. In line, a significant amount of venture capital has been fuelling HR technology startups dedicated to the identification of new talent signals. Here we will address key advances in this area, highlighting the dialectic between the old and new worlds.

If It Ain't Broke, Don't Fix It

There are really just two key questions in talent identification: What should be assessed and how? The "what" ques-

tion concerns the definition of talent and its elementary components. This question is important. If you don't know what to measure, there is no point in measuring it well. The "how" question concerns the methods used to quantify those components, for example, the weapons used by consultants, recruiters, and coaches to help organizations win the war for talent. The effectiveness of these tools is gauged by how well they predict future performance and improve organizations' ability to understand people.

Although definitions of talent vary, there are four basic heuristics to distinguish between more and less talented employees. The first is the 80/20 rule based on Vilfredo Pareto's observation that a disproportionate amount of the collective output of any group can be attributed to a minority of individuals, such

that 20 percent of people account for 80 percent of productivity, and vice versa. Talented individuals constitute the vital few (20 percent if not less) delivering most of the output. The second heuristic concerns the principle of maximal performance, which equates talent to the best a person can do. Accordingly, people are as talented as their best possible performance.

The third heuristic equates talent to effortless performance, emphasizing its relation to innate ability or potential. Since performance is typically seen as a combination of talent and effort, then talent can be defined as performance minus effort. In line, when two individuals are equally motivated the more talented person will outperform the other. The fourth heuristic equates talent to personality in the right place: when someone's skills, dispositions, and abilities are matched to the task, people should perform to a higher level. Thus the major goal of any talent acquisition venture is to maximize fit between employees' qualities and the role and organization they are placed in.

With these heuristics in mind, it is possible to identify who the talented individuals are. The next step is to figure out what qualities or characteristics they display. The most generic or universal qualities of talent can be represented with the RAW acronym. First, talented people are more *rewarding to deal with* (R). Interpersonal and intrapersonal competencies, such as EQ, emotional stability, and extraversion, capture this element of talent well. Second, talented people are more *able* (A), meaning they are better learners and have better judgment and domain-related expertise. Third, talented individuals are more *willing to work hard* (W), so they display more initiative and drive. These talent universals comprise stable individual differences which have been studied extensively.

As for the "how" question, it is noteworthy that the most established methods for talent identification remain alive and well. Over 100-years of Industrial Organizational (I/O) Psychology provide conclusive evidence, including several meta-analyses, on the validity of job interviews, assessment centers, cognitive ability tests, personality inventories, biodata, situational judgment tests, 360-degree feedback ratings, resumes, letters of recommendations, and supervisors' ratings of performance. These traditional talent identification tools also provide a solid organizing framework for classifying novel tools, not least because most novel tools are merely technologically-enhanced versions of what traditional methods. It is also important to note that there is as yet relatively little academic research validating the new tools, but that hasn't prevented HR practitioners from embracing these shiny new objects with enthusiasm. A cautionary lesson can be learned from the $2 million fine levied on Lumosity, a brain-training app, for being unable to substantiate its claims that playing its games enhances brainpower and cognitive abilities. Sadly, in the real world of HR assessments, the face and social validity of tools is rarely a reflection of their psychometric validity.

New Kids on the Blog: Talent in the Digital World

Traditionally, talent identification tools required candidates to go through a range of fairly structured situations, for example, taking a test, a personality assessment, going through an interview or assessment center, and so forth. Since much of our lives now occurs online, vast amounts of data on human behavior have generated a wealth of digital records about individuals' preferences, values, and reputation. These behavioral traces can become signals to infer talent or job-related potential. For example, by examining phone

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metadata (for instance, call frequency, duration, location.) M.I.T. researchers can produce a fairly accurate description of users' personalities. Similarly, users of the Foursquare or Swarm apps reveal their personalities through the types and locations of businesses they interact with.

This suggests that in the near future, profiling tools will become invisible to individuals and require no deliberate attention from job applicants or incumbents. Most people will be profiled already, and if they aren't, assessment will operate in the form of covert or subtle algorithms embedded in other activities, including fun and interactive, game-like experiences. On the other hand, these methods will require less human intervention, either for interpretation or decision-making.

While big data has turbo-charged analytics in fields as diverse as insurance, medicine, and marketing, HR has generally lagged behind. For all the talk of an HR big data revolution, and the rebranding of the field as "people analytics," novel talent identification tools remain in their infancy. With the notable exception of professional social networking sites, such as LinkedIn, user-adoption of new tools is relatively low. And, though its potential is undeniable, LinkedIn is still little more than the modern version of a resume, phone directory, and recommendation letter, combined. Like other novel tools, LinkedIn still requires human inferences and decisions are largely holistic, intuitive, and focused on hard skills rather than core talent qualities.

In our view, four other emerging areas have the biggest potential for advancing—perhaps even disrupting—the talent identification industry. These are
- Digital interviewing and voice profiling
- Social media analytics, web scraping, and text analytics
- Internal big data and talent analytics
- Gamification

As shown in Table 1, each of these areas corresponds to a well-established talent identification methodology. These new tools are discussed briefly below.

Digital Interviewing and Voice Profiling

Although the average job interview is less valid than other assessment tools, interviews are *the* ubiquitous selection tool. To improve their reliability and validity, some companies ask candidates to respond via webcam to pre-recorded, structured questions. Managers can watch the recordings at their convenience, saving time during the hiring process, and standardization is increased.

Voice-profiling software uses machine-learning algorithms to predict the emotion that the voice will generate on listeners. Attractive voices pass to the next round, where they are judged by humans, while undesirable voices are eliminated from the contest. More recent developments include video-mediated scenario-based questions, images, video, and work samples (see, for example, Hirevue.com), and automated reading of micro-emotions during the interview.

Old methods	New tools	Dimension assessed
Interviews	Digital interviews Voice profiling	Expertise, social skills, motivation, intelligence
Biodata Supervisory ratings	Big data (internal)	Past performance Current performance
IQ SJT Self-reports	Gamification	Intelligence, job-related knowledge, big five personality traits or minor traits
Self-reports	Social media analytics	Big five personality traits and values (identity claims)
Resumes References	Professional social networks (LinkedIn)	Experience, past performance, technical skills and qualifications
360s	Crowdsourced reputation / peer-ratings	Any personality trait, competencies, reputation

Social Media Analytics and Web Scraping

Humans are inherently social and our drive to connect and engage with each other has fuelled Facebook's stratospheric growth: over 25 percent of all the people in the world, and 80 percent of adult online users, have a Facebook account. Michal Kosinski and his Cambridge colleagues have shown that the Facebook *likes* can predict key talent signals like personality and IQ. For example, people with higher IQ tend to like science, *The Godfather*, and Mozart. Surprisingly, one of the key markers of high IQ was liking curly fries, but media coverage of this finding led to a systematic increase in the liking of curly fries on Facebook, even by people who do not have a high IQ. However, machine-learning algorithms can auto-correct to replace deficient signals with stronger indicators—as soon as too many unintelligent people like curly fries, curly fries stop being a signal of intelligence.

Firms like TalentBin and Entelo have employed similar approaches to scrape hundreds of thousands of profiles to identify passive job seekers who might fit a particular role. To the degree that their methods are accurate, they could save recruiters and job seekers a great deal of time by closing the gap between supply and demand and making the job market more efficient—not to mention potential improvements in improved worker satisfaction and firm productivity.

A promising methodology for inferring talent from social media and other web activity is the use of linguistic software extraction applied to unstructured or free-form text. For example, certain words are used more frequently (online and offline) by neurotic individuals: e.g., "awful", "horrible", and "depressing." Likewise extraverts mention "bars." "drinks," and "Miami" significantly more often than introverts do. And as commonsense would dictated, less intelligent people mangle grammar and make more frequent spelling errors.

There are already free tools available for translating open text into personality (IBM's Watson does it for you here: http://bit.ly/1OjlkuR). Tools are emerging that analyze email communication and even provide coaching on how to write back to the sender, based on the personality profiles inferred by these tools—see for instance Crystal Knows here: http://bit.ly/1lkv5gB.

Big Data and Workplace Analytics

In-house big data is another rich source of talent information. So much work is now digital in nature, and increasingly transmitted via the internet-of-things, that vast amounts of work-related behavioral data exist. The mining of these data to identify markers or signals of talent is based on a very solid I/O psychology principle, namely that past behavior is a good predictor of future behavior. Much like Amazon's filtering algorithms, which recommend products based on previous purchases, organizations can predict improvements in sales or customer service based on specific behavioral data. Algorithms can be developed and tested retrospectively and prospectively to create predictive models connecting human capital to organizational effectiveness: for example, linking employee personality to business-unit performance or customer satisfaction.

In-house big data can also be used to identify critical organizational networks, and map the behavioral dynamics that characterize group activity at work. Alex (Sandy) Pentland and his MIT colleagues used tracking devices— sociometric badges—to monitor a wide range of employee behaviors pertaining to social interactions at work. This technique predicted to whom people go for advice (or gossip), and how ideas and information spread within an organization and beyond. Without paying attention to the content of their conversations, Pentland and colleagues still provided a

clear measure of the hidden forces that govern organizational life. This methodology is the physical equivalent of web scraping techniques, but instead of mining a person's digital footprint, physical activity at work is analyzed.

Another important innovation within the space of in-house big data is the case of peer evaluations or open source ratings. Glassdoor, a sort of TripAdvisor for workplaces, is a good example. Glassdoor enables employees to rate their jobs and work experience, and has manager ratings for nearly 50,000 companies. Much like ratemyprofessor.com yelp.com, anybody can leave and retrieve a rating. This open-source methodology enables employers to see how employees perceive the company culture and how individual managers impact on their subordinates and their workplaces. These data enable organizations to crowdsource evaluations of leadership, looking at the link between employees' ratings of satisfaction and company performance.

Gamification

There are now more Americans playing videogames than not, and half of all gamers are under the age of 35. Furthermore, most parents, at least in the U.S., think that video games have a positive influence on their children. It therefore seems obvious to look for talent signals embedded in games. In the context of profiling tools, gamification attempts to enhance the user experience by incorporating features from videogames, or at least shortening or spicing up traditional assessments. Pymetrics (pymetrics.com) requires test takers to play 12 different games that measure a total of 50 cognitive and emotional traits to provide personalized career advice.

Visual DNA uses image-based personality quizzes to segment consumers on the basis of the big five personality traits, and links these data with web browsing data obtained via cookies. Gamification has quickly become mobile. Another company, Knack, claims to extract a large number of talents ("knacks") from playing a variety of puzzle solving games on mobile phones. What is interesting about Knack is that it has taken on the gamified persona completely, awarding players badges that they can display and share with friends. It remains to be seen whether sharing this information with others will prove attractive or not.

The Future Is Already Here

The digital revolution is transforming HR assessments. In a hyper-connected world where everyday behaviors are recorded, unprecedented quantities of data are available to quantify human potential. The datification of talent is upon us, and new technologies are an exciting prospect. But we must not get carried away. To date, new tools have not yet demonstrated comparable accuracy to old school methods, and they tend to disregard theory and pay little attention to the constructs being assessed. Predicting behavior is clearly a key priority in talent identification, but understanding behavior is equally important. Until peer-reviewed evidence emerges of the incremental validity of new methods over and above the old, the former will remain shiny new objects in the brave new world of HR.

Moreover, three additional concerns may constrain the implementation of new assessment tools in actual talent identification processes. First, privacy and anonymity concerns limit access to individual data. Second, in order to match or surpass the levels of accuracy attained by estab-

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lished tools, the cost of building new tools may be prohibitive. For instance, developing a valid and comprehensive gamified assessment of personality costs much more than a traditional self-report or situational judgment test. These two points may contribute to our final concern, that these tools may identify individual's ethnicity, gender or sexual orientation as well as talent signals. Certainly in the US, EEOC guidelines around adverse impact must be considered; even a fundamentally solid assessment tool will come under additional scrutiny and challenged if it is viewed to contribute to adverse impact. All the more reason for evidence based review of new tools.

In short, people are living their lives online. By doing so they make public their behavior, and that behavior leaves more or less perpetual traces—often inadvertently. The ability to look through the noise of all this information and identify robust talent signals is improving, but merging today's fragmented services with scientifically-proven methods will be necessary to create the most accurate and in-depth profiles yet. ⊞

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