GAME-BASED ASSESSMENT – THE NEW REVOLUTION OF CANDIDATES' ASSESSMENT

Dan STĂNESCU
National University of Political Science and Public Administration
30A Expozitiei Blvd.., 012104 Bucharest, Romania
dan.stanescu@comunicare.ro

Adrian TOŞCA
Structural Management Solutions
1 Nicolae Titulescu Blvd., bl. A7, sc.4, ap.115, 011131 Bucharest, Romania
adi.tosca@structuralmanagement.ro

Cătălin Gabriel IONIȚĂ
Structural Management Solutions
1 Nicolae Titulescu Blvd., bl. A7, sc.4, ap.115, 011131 Bucharest, Romania
catalin.ionita@structuralmanagement.ro

Abstract. *Within the framework of staff assessment, especially in the selection area, game-based assessments (GBA) have become one of the most discussed developments in recent years. Game-based assessment has received a lot of media attention and managed to capture the interests of many organizations (e.g. Unilever, AXA Group, Deloitte, etc.). What are actually game-based assessments? These are games that allow you to measure the knowledge, abilities, values, personality, motivation, or skills of the rated person. They fall into the broader category of "serious games", i.e. games designed for purposes beyond entertainment. The introduction of GBA into selection programs contributed, among other factors, to increasing the volume of applications and decreased dropout rates compared to other tests, such as traditional numerical and verbal. Game-based assessments can also help maintain a high commitment during the evaluation and also increases the amount of time that data can be collected. Previous studies highlight that those applying for a job are eager to use game-based assessment for self-evaluation, especially when these games are available for free. Also, in game-based assessment, it is likely to be less obvious to a candidate what behavioral / response elements are measured. Game-based assessment is more likely to generate genuine responses from candidates because they are immersed in gaming experience, thereby reducing the likelihood of falsification and distortion responses. Previous studies have shown that gamified evaluation reduces testing anxiety and that this type of games has been well received by candidates in real selection settings. The assessment is also reinforced by the fact that not only the final data (final result) is recorded, but also process data such as reaction time, time spent on each item, or intermediate steps taken to reach the final result. This new information can add value to the conclusions drawn on the knowledge, skills or traits of the candidates. The potential of games as evaluation tools can only be achieved if data evaluation methods can be developed in psychometrically feasible ways. Many of the traditional methods developed to evaluate the fidelity and validity of (classic) tests do not match game-based assessment. Currently, the game-based assessment marketplace is dominated by alternatives that are not very clear in comparison to traditional psychometry.*

Keywords: game-based assessment; recruitment; psychometrics.

Introduction

The application of game mechanics and game design – often called gamification – in non-gaming contexts such as in business, education, and social projects has emerged as a major trend in recent years. Gamification is the use of game-play mechanics for non-game applications (Deterding et al., 2011). Within the framework of staff assessment, especially in the selection area, game-based assessments (GBA) have become one of the most discussed developments in recent years. Game-based ratings have received a lot of media attention and managed to capture the interests of many organizations (e.g. Unilever, AXA Group, Deloitte etc.). In a recent study of human resources practitioners, 75% of participants indicated that they would consider using gamification as part of their own recruitment and selection strategy in the near future (Cut-e Group, 2017).

Gamification guru, Yu-kai Chou defines gamification as "the craft of deriving all the fun and addicting elements found in games and applying them to real-world or productive activities" (Huang & Soman, 2013, p.6). Gamification "represents a management practice similar to other managerial initiatives designed to make the experience of work more positive" (Mollick & Rothbard, 2014, p.16). Gamification can be used for numerous purposes and in various fields. For instance, gamification has a particularly special place in the HR community. Jacobs (2012), stated that "we can gamify many areas of HR, from talent sourcing through to performance management" (p.14). Modern day HR divisions take an increasingly data-driven approach to people management, i.e., the people analytics approach. Games are a powerful instrument for studying human behavior. In a game, rather than asking someone what they did, you can directly observe their behavior. Games also foster increased participation and motivation, which leads to increased quantity and quality of data. By coupling the data advantage provided by gamification with sophisticated analytic techniques, meaning can be extracted. These data-driven approaches are better at dealing with complex data sets, capturing nonlinear relationships, and predicting future outcomes. As a result, they are better suited to modeling real-life complex problems.

Game-based assessment in recruitment

Technological development and increasing globalization force companies to look for new solutions. Candidates for the job have also been subjected to the change characteristic of the present day. The people from the Generation Z (born after 1990) and Generation Y (born after 1980, the so-called Millennials) approach potential jobs with a different attitude than their predecessors (McCrindle Research, 2006). Daily use of the IT sector, greater confidence and commitment to their own hobby means that they require from an employer mobility in obligations and make full use of available technology solutions (Ng, Schweitzer, & Lyons, 2010). Recruitment via Skype, or submitting an application for a post in the company on the other side of the globe is not a challenge, but daily life for Ys and Zs. So, in searching for new forms of employee selection, it is necessary also to take this aspect into account.

Recruitment refers to "any practice or activity carried on by the organization with the primary purpose of identifying and attracting potential employees" (Noe et al., 2012, p.202), so it comprehends all the techniques to make the organization suitable and appealing for skilled workers. As Hinojosa (2015, p. 2617), stated, "recruitment

activities are important for attracting top talent and are a source of competitive advantage for an organization"

Recruiting activities have undergone a series of changes through time, starting from the traditional recruitment to e-recruitment, to finally come up until the gamified recruitment, which is considered to be the most innovative way developing today. But, the advent of a new way of recruiting does not mean the end of the other techniques. In fact, no one is abandoning the old way, but all the research suggests that incorporating tests and games in the process delivers a higher predictor of success (Starner, 2014).

E-recruitment (www.hrzone.com) means using electronic resources, typically the internet but also HR software, to guide or assist the hiring process in order to reduce the administrative and financial burden of recruitment and gain access to a wider pool of talent. This kind of recruiting can be realized by agencies that through the Internet are able to collect bigger numbers of resumes and to send these CVs to companies. However, organizations can do it by themselves through apposite brand websites that enable potential employees to know about them. In this case, the process is easily structured and the advantage is that candidate can add his/her data and can send them in real-time to the organization. Organizations want "to motivate job applicants to explore their recruitment websites to learn more about the organization's history, values and vision before finally applying" for a vacant position (Reiners & Wood, 2015, p.554). Secondly, organizations want to make their job offers more enticing also once applicants are received.

A second advantage is that organizations can check increasing numbers of resumes and it enlarges the potential of achieving good employees. Another clear advantage is that e-recruitment reduces the costs compared with the traditional ways of looking for new employees, like agencies or newspapers. Furthermore, e-recruitment does not eliminate the job interview, so it means that once organizations select potential candidate from the huge amount of resumes received, they have to interview these people because information contained within CVs are not sufficient to understand their capabilities. From the point of view of employees, it enables them to reduce the time spent looking for a job and it allows them to find new opportunities rapidly, increasing their possibilities of changing company.

Even if it is not so easy to understand the perfect candidate, social network sites represent a good way to attract people, sharing advertising to know the brand and to say when there are vacant job positions available. It has been revealed that 68% of online adults use social networking sites such as Facebook, Twitter, Instagram and so on (www.pewinternet.org). To better understand what social networks are, the definition provided by Boyd and Ellison (2008), was used: "we define social network sites as web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system" (Boyd & Ellison, 2008, p.211).

The use of social networks is evidently a successful route and the new ways in which recruiters are interacting with candidates is allowing for more enjoyable experiences. Brands that are choosing to use gamification are obtaining higher levels of retention and building bigger online communities (http://theundercoverrecruiter.com). At the same

time, people like to show themselves on the social media. This can help organizations exploit these tools and the information they share to understand candidate profiles, personalities and characteristics. Therefore, social network sites like Facebook, LinkedIn, blogs on websites and YouTube became the best ways to reach the desired people.

This type of recruitment is usually defined as social recruitment. Social recruitment it "is concerned with sourcing candidates for jobs via social media channels and social media networks" (www.hrzone.com) For instance, LinkedIn was born for business because it came to life for the working world. It enables people to exhibit the personal career with the places they worked in, the studies they attended to and so forth. It provides the recruiters the chance to identify top talents immediately. It also enables the establishment of a personal network of colleagues and organizations, increasing the possibility of being selected for a job interview. Furthermore, well-prepared people rapidly change their position. While in the past, young men started working in a company and more or less spent their entire life working there, now, people have no limits, can travel easily and can change job and country without any problems. Another changing dynamic is that graduate people are less skilled and have low experience, so there is a sort of war to attract the best talents from the universities. Now, the goal is that companies show the vacant positions in a way that help possible candidate to apply for that job.

As stated by Kim and colleagues (2012, p.1612), "many firms now realize the importance of actively attracting and retaining highly skilled, quality employees as a necessary component of their competitive advantage". It is well accepted that, the basis of the success of any company is due to the human capital, which is the combination of people's capabilities and skills. Therefore, the fundamental job of any recruiter is sourcing talent and engaging employees in the organization. For this, they have to ensure that the candidate's skills match well with the organization's requirement and culture. When Gamification is applied to the recruitment process, it brings several benefits. Candidate elimination is done at a much faster pace as it allows firms to test specific skills like time management, creative and innovative thinking etc. It helps the candidate to understand the information about the firm and policies while having fun. Gamification's tool has the potential to bring out the on-the-job performance of the candidate by giving him or her a simulated platform of the job. Apart from that, it also helps in revealing actual behavior and capabilities of the candidate. Gamification is attractive and came as an innovative platform for the companies. It thus helps in establishing the brand as a leader in its field, especially among youth (Han & Collins, 2002). The use of gamified recruitment increases the positive image of the organization and at the same time the employment brand. Employment brand refers to the group of tangible and intangible elements that identify and make a company unique for job seekers, showing which are the characteristics of the working experience within the organization itself (Lievens et al., 2007). The employment brand can be defined "as outcomes of applicants' decision opportunities attributable to job seekers' beliefs about the company as an employer"; therefore, it is the perception about the company from the point of view of potential candidates (Han & Collins, 2002). In fact, if potential applicants see that the company is so innovative even from the recruiting point of view, it could mean that it is innovative also in the production processes and it can be highly attractive for talents, even if working for other competitors. Furthermore, candidates do not perceive the lack of overlapping of content between the test and the workplace as deterioration in validity, and the increased

satisfaction and perceived robustness of the game-based assessment have a positive effect on the overall perception of the fairness of the selection. Actually, gamified solutions for recruitment make hiring processes more meritocratic from candidate point of view, and for this reason, they can instill more confidence and trust.

Although the evidence is still insufficient, there are a number of intuitive arguments for the benefits of game-based assessment. Overall, employers can use game-based assessment to present an innovative image of the organization and increase their attractiveness to potential candidates without compromising their professionalism. The use of (serious) games as an evaluation tool can extend and even strengthen the field of assessment as this type of games has the potential to reveal both the knowledge and the skills and traits that are more difficult to detect when evaluated through traditional evaluation methods, (De Klerk, Eggen & Veldkamp, 2014; Mislevy et al., 2014). Following the methodological approach already used in educational environment (Al-Azawi et al., 2016), two approaches to building and using GBA in the organizational environment can be distinguished: gamified assessment – by gamifying (already existing) psychometric test; psychometric play - use of a game to gather evaluation data.

In a study by Montefiori in 2016, it was noted that from the perspective of the candidate, the presence of the assessment based on games in the selection process are a motivating factor for more than half of the surveyed participants (Montefiori, 2016). In an organizational context, game-based assessment is not limited to selecting applicants. It can also be a very useful tool that can be used to attract potential candidates. Previous studies (Laumer et al., 2012) highlighted that those applying for a job are eager to use game-based assessment for self-evaluation, especially when these games are available for free. Game-based assessments can also help maintain a high commitment during the evaluation, which reduces the likelihood of some candidates dropping out in the process and also increases the amount of time that data can be collected (Iseli, Koeig, Lee, & Wainess, 2010; Levy, 2013).

Also, in the GBA, it is likely to be less obvious to a candidate what behavioral / response elements are measured. This aspect was highlighted by Csikszentmihalyi (1990), who asserts that game-based assessment is more likely to generate genuine responses from candidates because they are immersed in gaming experience, thereby reducing the likelihood of falsification and distortion responses (Csikszentmihalyi, 1990). Previous studies (Kato & de Klerk, 2017) have also shown that game-based assessment reduces testing anxiety and that this type of games has been well received by candidates in real selection settings. The use of (serious) games as an evaluation tool can extend and even strengthen the field of assessment as this type of games has the potential to reveal both the knowledge and the skills and traits that are more difficult to detect when evaluated through traditional evaluation methods, (De Klerk, Veldkamp & Eggen, 2015; Mislevy et al., 2014).

Instead of inviting applicants to job interviews right away, organizations give them games that simulate the work environment and test their aptitude" (Herger, 2014, p.16). Therefore, gamification can allow recruiters to test candidate's skill, motivate them to complete certain tasks, and generally engage with the recruitment process (http://recruitloop.com). As Roebuck (2012, p.42) stated, "by applying the same principles that inspire people to play games, such as achievements, status and rewards, businesses can drive deeper engagement and use this to attract [...] employees, as well

as improve staff and business performance". Game, mixed with fun, can increase people's motivation improving their interest toward a particular job position, a company or a brand. From the point of view of applicants, the motivation is high for many reasons. Firstly, they are applying for a position in an innovative company, which is exploiting the best and recent techniques to hire the more talented people and it is stimulating by itself. Secondly, they are playing, so they can take the experience more positively, and with sportsmanship, compared with a common interview.

One of the key advantages of using gamification in recruitment relies on the fact that not only will candidates be coming back regularly to interact with the company brand, but they will be acting as advocates for the brand (http://theundercoverrecruiter.com). Another advantage is that organizations can attract a more diverse group of applicants (http://www.executiveboard.com).

Gamification can help recruitment to understand people's behaviors, state of mind, abilities, attitudes and potentialities while fulfilling their mansions. "Understanding a person's job skills from how well they play is passed on an extensive body of psychometric research about how behavior links to actual job performance" (www.revelian.com). Gamification inherently immerses test takers in the game world, allowing them to respond naturally to challenges. These natural responses can unveil a lot about a potential employee's cognitive skills, such as their decision-making, leadership, efficiency and organization (Aldridge, 2015). While people are playing they "generate several megabytes of data, exponentially more than what's collected by the SAT or a personality test. They measure how long you hesitate before taking every action, the sequence of actions you take, how you solve problems – all of these factors are logged as you play, and then are used to analyze your creativity, your persistence, your capacity to learn quickly from mistakes, your ability to prioritize, and even your social intelligence and personality" (Peck, 2013).

In one of the biggest advantages of game-based assessment also lays the greatest challenge. What to do with and how to interpret the enormous quantities of data that can be produced by performing a game-based assessment (Levy, 2013). In contrast to a standardized test, which only produces product data, a serious game also provides process data. Process data are the actual log files of data collected that can, in great detail, when analyzed, show how students have reached their product data. Process data are mouse clicks, keystrokes, navigational behavior, time stamps etc. (Rupp et al., 2012). Performance in a serious game can produce many pages of log file data in just a short period of time. The challenge is to find meaningful relationships between the data presented in the log files and their relationships to the constructs to be measured in real life.

Even if this effective tool is developing with success especially among big corporations, we need to underline some of its pitfalls. First of all, we need to make some considerations about the costs faced to sustain this new solution. Organizations can create their own games to attract new talents, but designing the right one with the specific elements and characteristics appropriate to understand the candidate is not easy. For this type of approach, any organization will need to be supported by experts of gamification and psychologists specialized in psychometrics. It has been estimated that 80% of gamified apps will fail to meet business objectives, primarily due to poor design (http://theundercoverrecruiter.com). In fact, first it is important to understand what

the organization is looking for in terms of soft skills, and second, it is essential to translate these needs and requests in the right forms of gamified solutions.

Another disadvantage is that probably these tools are young-people-directed. Moreover, one of the risks candidates could face is to underestimate the importance and the validity of the test. While game-based testing works very well in educational environment, many test takers are skeptical of its applications in formal assessment. Some test takers fear that if an assessment is gamified, this promotes the idea that the exam is less formal, or that the answers don't hold as much importance. The risk here is that people will take the tests less seriously, and thus performs worse than they would have on a traditional test (Aldridge, 2015). In fact, according to a survey of 600 HR professionals by SHL in 2015, "only 44 percent of human resources pros said their organizations use objective data on employees' competencies and skills to make workforce decisions" (www.insurancejournal.com). In particular, we would like to underline that "it will take time before researchers determine how well these new assessments predict job performance" (Meinert, 2015, p.92).

While people are playing, the algorithms behind games are able to track the personal skills and abilities. It is not clear how these algorithms work, but as those from knack.it stated, "the company team has expertise in behavioral and cognitive neuroscience, big data and data science, computer science and software engineering, game design, and user-experience design" who help them analyze data efficiently and with scientific rules (www.knack.it).

Although Game-Based Assessment (GBA) has become increasingly popular in workplace assessment, especially, in the context of large international companies' graduate and apprenticeship schemes, yet little is known about this psychological assessment approach. Scientific research describing this psychological assessment approach is virtually non-existing, and there is often confusion about the nature of this method and the place it occupies in the wider gamification arena. Cause and effect at the data analysis stage of elaborately designed games becomes difficult, if not impossible. The greater the number of design elements, the higher the risk of result of contamination, and the harder it is to interpret behavior, to the point that it is impossible to directly link a behavior to a specific measure (Narayanan et al., 2016). The real challenge is to identify and select the best evidence linking game performance with the assessment of participants' abilities.

Many of these games are based on scenarios or contexts which, at best, seem irrelevant and, at worst, misinform the job-role requirements of potential candidates (De Klerk & Kato, 2017). Some game design elements may not be necessary or even interfere with selection (e.g., feedback, Yigal & Mairav, 2015). Nevertheless, with the psychometric models improving (Mislevy et al., 2014), we might also see game-based assessment being used for a summative or credentialing purpose in the future. Future research should therefore focus on investigating the extent to which serious games can be used in high-stakes assessment.

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