



# How to Hire a Gen Z Through Gaming

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*Given over 3.2 billion people game, including multiple generations of digital natives, we present the opportunity to use advancements in cognitive and perception-based metrology to transform any game into a recruiting tool for Gen Zs.*

The use of video games as recruitment tools has evolved significantly since the U.S. Army's launch of America's Army in 2002, which pioneered the concept of using a video game to attract potential military recruits. Today, as gaming has become a global phenomenon with more than 3.2 billion players, the opportunity to leverage games beyond entertainment for talent acquisition and skill development has grown. However, fully harnessing gaming as a tool to assess cognitive and perceptual abilities remains untapped (Figure 1).

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The Gamer Doctors (TGD), an application developed in part by Dr. Khizer Khaderi and his team at the Stanford Human Perception Lab, represents a transformative step in this direction. TGD allows for the passive capture of both cognitive and perception-based metrologies—the latter being particularly challenging to assess—during gameplay. This innovation provides a

more nuanced and scalable way to assess digital natives, such as Gen Z and Gen Alpha, who have developed distinctive cognitive and perceptual skills through their immersive interactions with technology.

TGD's approach involves creating gamer archetypes, which categorize players based on their cognitive and perceptual profiles, offering insights into their strengths. The original purpose of the gamer archetypes was to personalize game recommendations based on a player's intrinsic skill sets versus traditional methods of measuring a player's gameplay skill sets. During the development of gamer archetypes, we realized the identification of innate skill sets could be applied to job recommendations (Figure 2).

Although inspired by *America's Army*, technology development was not limited to a specific game/genre, but rather focused on development of application programming interfaces (APIs) allowing any video game the ca-

**America's Army: How the Army used a first-person shooter to change how we recruit people for jobs**

The goal of the *America's Army* project was to build an online 3D PC game that

Americans who knew nothing about the Army. The project was pretty important as the Army had failed to meet its recruiting goals in 1999—the *America's Army* Project became the point of the spear for recruiting for the U.S. Army once the game was released.<sup>1,2</sup>

The idea for the game came out of an observation the Army made of its recruits. New recruits to the Army typically had an Army toy, a GI Joe, or a model tank, in their kit in the barracks. When the Army asked about the origin of the toys, they found that someone in their family had given it to them sometime during their ages of 11–14. The Army discovered that young Americans with such toys were twice as likely to consider a career in the Army than those without.

The Army wondered if an online game could serve the same recruiting function and decided to fund the development of that game.

As part of that game's development, the Army additionally studied the issue of whether the Armed Services Vocational Aptitude Battery (ASVAB)

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pability to capture cognitive and perceptual psychometrics. This strategy democratizes access to psychometric assessments across any game genre but also opens new possibilities for recruitment and workforce development in industries that rely heavily on these skills. By seamlessly integrating assessment tools into any gaming experience, TGD presents an opportunity to transform gaming into a powerful medium for identifying and developing talent in the digital age.

provided the experience of a potential career in the Army. The idea was to make the game as Army-accurate as possible, a game that would educate and engage those young Americans thinking about a potential career in the U.S. Army. The Army was looking for young Americans ages 11 to 14 to play this game. The Army knew if a young American played this game between those ages, then when they turned 18 they would be twice as likely to consider a career in the Army as young

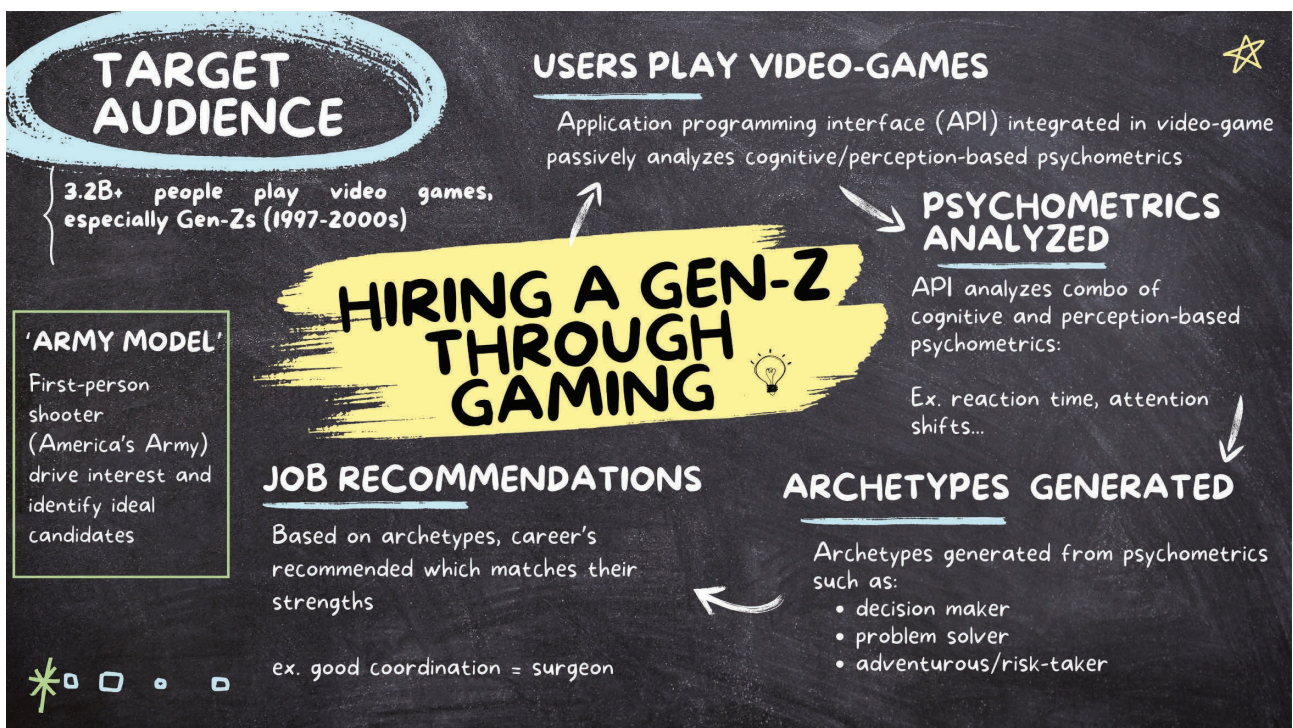


FIGURE 1. How to hire a Gen Z through gaming.



score could be computed from game play. The ASVAB score project revealed that it could be computed from properly designed game play. The Army decided not to ship the ASVAB score part of the *America's Army* game due to privacy concerns.

The ASVAB score is used by the Army to determine potential career paths for its recruits. The score is used to bucketize recruits into potential careers in which they will do well. The Army, like all employers, wants everyone it hires to succeed, and one of the best ways is to channel new recruits into appropriate career paths.

The *America's Army* game turned out to be the most successful recruiting tool ever developed by the Army and it ran online from July 2002 to February 2022. Following the closure of the online game, the Army began, once again, missing its recruiting goals, and general officers began once again asking if the game could be restarted.

## EVOLVING GAME-BASED RECRUITING FOR DIGITAL NATIVES

The recruitment of digital natives—those born in an age defined by ubiquitous digital technology—has proven to be a unique challenge for traditional recruitment models. *America's Army* was

visual processing speeds, due to their exposure to fast-paced digital environments like video games.<sup>4</sup> Leveraging gaming platforms to passively capture these abilities is where technology such as TGD becomes critical. TGD assesses both cognitive and perceptual skills—providing insights into candidates'

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among the first initiatives to blend gaming with recruitment, using a military simulation game to attract and engage potential recruits.<sup>1</sup> However, broader adoption of games as recruitment tools across industries has lagged behind.

Digital natives, including Gen Z and Gen Alpha, exhibit distinct cognitive characteristics, such as enhanced multitasking abilities and increased

problem-solving abilities, attention, and reaction times without the need for traditional testing environments.<sup>5</sup>

## PERCEPTION AND COGNITIVE MODELS FROM GAMEPLAY

Recent advances in cognitive and perceptual sciences have emphasized the role of perception in game-based

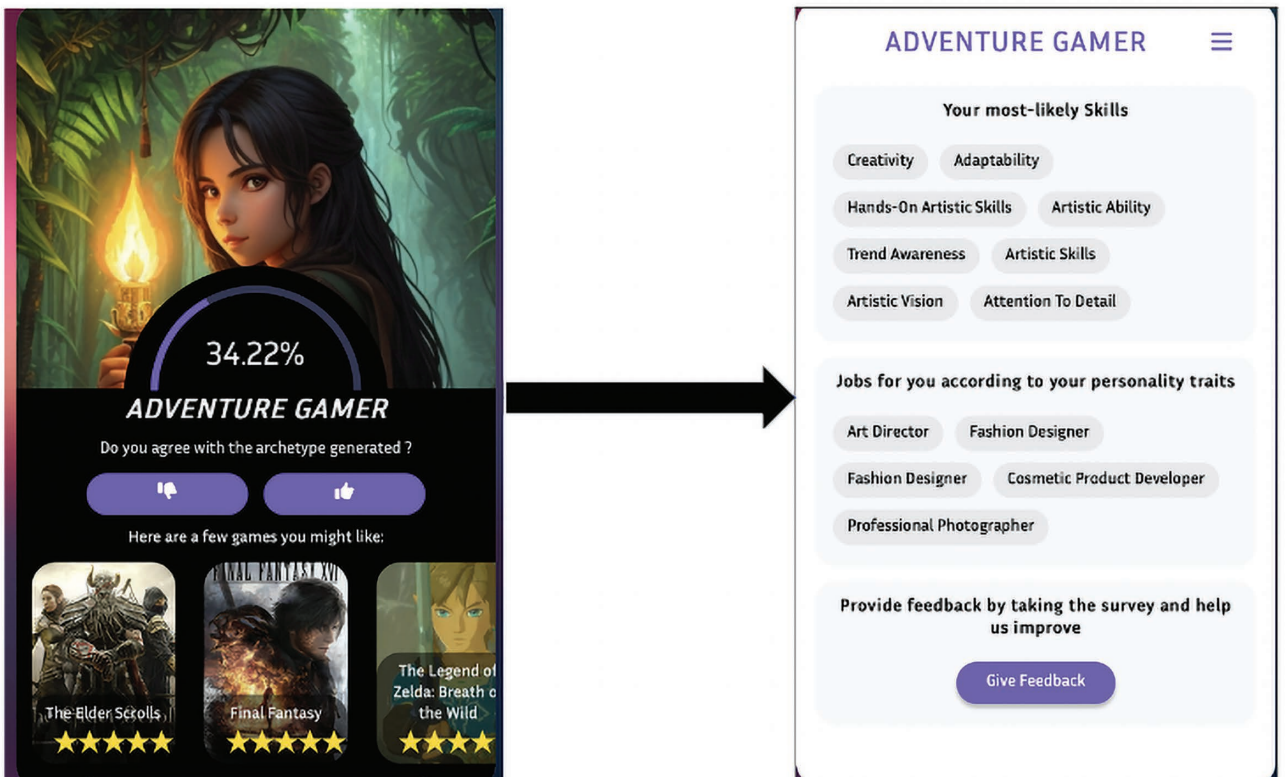


FIGURE 2. Gamer archetype identifying skills and recommendations for games and jobs.

environments. Studies show that perceptual abilities, such as depth perception, reaction time, and spatial awareness, can be measured and improved

success.<sup>10,11</sup> By analyzing in-game behaviors, such as reaction times or attention shifts, the system provides a passive methodology to comprehen-

Studies show that perceptual abilities, such as depth perception, reaction time, and spatial awareness, can be measured and improved through gameplay.

through gameplay.<sup>4,5,6,7,8</sup> These abilities are critical in professions requiring quick, accurate decisions, such as health care, aviation, and cybersecurity.

TGD uses cognitive and perceptual models, derived from psychometric metrology, to capture how players behave in digital environments. These models identify key abilities, such as decision-making and spatial reasoning, which are indicative of job

sive understanding of the player's cognitive and perceptual profile.

This approach aligns with research showing that gaming environments provide valid simulations of real-world cognitive tasks, including problem-solving and multitasking.<sup>12</sup> Studies also show that perceptual skills developed during gameplay are transferable to tasks that require high levels of spatial awareness and visual acuity, such as surgery or piloting.<sup>13</sup>

Prior to developing the TGD application, Dr. Khaderi's work in perception-based psychometrics included developing the vision performance index (VPI) to measure key cognitive and perceptual functions through interactive media.<sup>9</sup> This tool uses games to capture fields such as visual attention, field of view, multitasking, and endurance (Figure 3).

In constructing the VPI, attention was turned to creating simple game experiences, with retro-style designed games, as noted in Figure 4. As a player goes through the game experience, real time passive capture of raw psychometric signals are occurring. The player receives both an in-game score, as well as a VPI score, with the breakdown of the VPI score in five dimensions noted in Figure 5.

The Stanford Human Perception Lab (HPL) conducted studies of sport

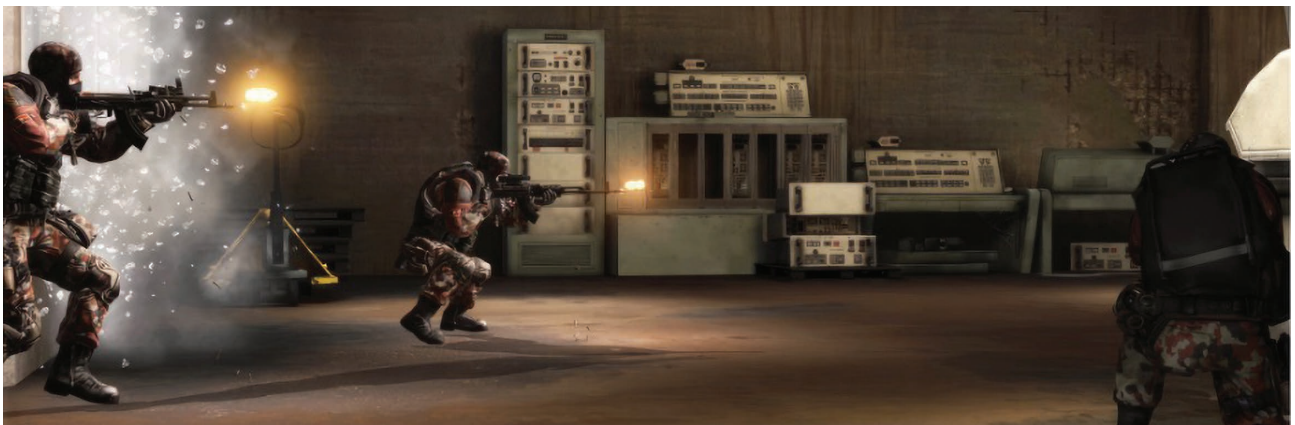


FIGURE 3. Visual function, digital behavior, and the vision performance index.

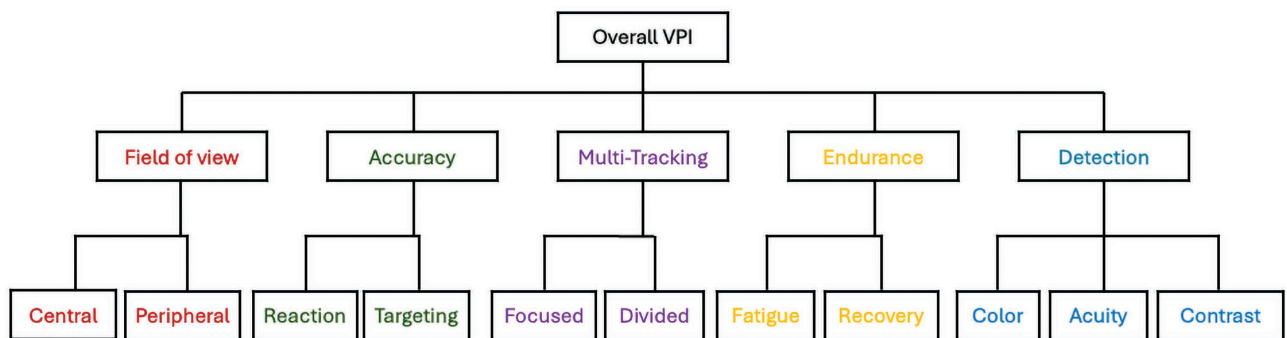


FIGURE 4. America's Army, the Pentagon's video game.<sup>3</sup>

professionals across different genres of games utilizing the VPI. Given the demanding nature of training of esports professionals, identifying methods of optimizing performance, while balancing a healthy lifestyle was an important objective of this study. The study revealed the VPI of players who worked out at least 2 h a week and trained in intervals of 2–5 h of screen time were able to maintain high levels of success in competition (Figure 6).

By tracking in-game actions and reactions, VPI offers a noninvasive way to assess abilities critical for decision-making and task execution in high-performance environments.<sup>7</sup> Khaderi's work on VPI has been utilized in the field of sports and esports to measure player performance, most recently endorsed by the International Olympic Committee.<sup>16</sup>

Khaderi's research demonstrates that perception-based assessments are effective at identifying changes in cognitive and visual perception performance, as well as laying the groundwork for applying this metrology in other contexts, such as recruitment to predict an individual's performance in complex, high-pressure jobs.<sup>7</sup> TGD's platform integrates these cognitive and perceptual sciences by capturing how players interact with digital environments, transforming these interactions into measurable outputs.

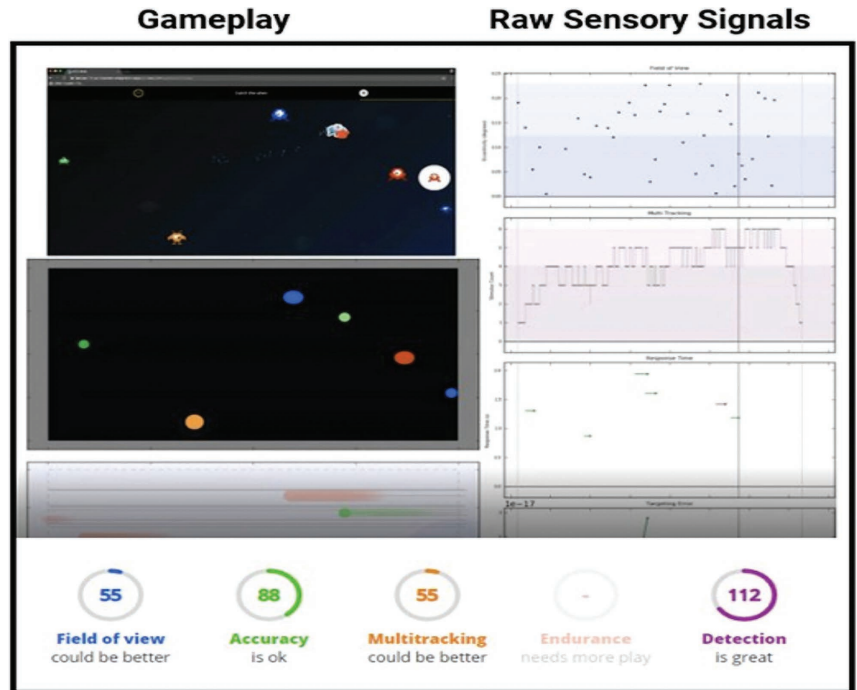


FIGURE 5. Passive capture of psychometrics through games and the vision performance index.

### Gaming as the future of Human Resources

The science behind TGD's platform is grounded in cognitive psychology and psychometrics, which have long been used to predict job performance based on task engagement.<sup>7,8,9,10,11,12</sup> Video games provide rich datasets, allowing researchers to capture how players make decisions, react to stimuli, and manage tasks, all of which are important indicators of professional potential.<sup>11,12,13,14,15</sup>

The system's models are informed by decades of research in perception science and psychophysics, such as Khaderi's VPI studies, which demonstrated that gameplay could reveal key cognitive and visual perception functions in healthy and vision-impaired populations.<sup>7</sup>

Building on the work of Dr. Khaderi and team, the TGD application was designed with Gen Z in mind. Given the majority of digital natives play games for



FIGURE 6. Lifestyle factor effects on esports professional performance.

entertainment, the skills they have passively developed in simulated environments have demonstrated the potential to be translatable in the real world.<sup>4,5,6</sup>

Game-based environments allow for the recognition of skills often overlooked in traditional HR assessments. For example, skills like hand-eye coordination, reaction speed, and spatial memory can be objectively measured through gameplay, providing a reliable assessment of a candidate's capabilities.<sup>14</sup> TGD captures these skills and offers a detailed

profile of the player's strengths and weaknesses, supported by research showing that gaming assessments can predict job performance in fields such as logistics and engineering.<sup>15</sup>

Similar to the methodology used in measuring player performance with the VPI, TGD captures cognitive and perception-based psychometrics passively as shown in the infinite runner game displayed in Figure 7. Real-time passive measurement of player multi-tasking skill is noted in the workflow

in Figure 7, as well as in more detail in Figure 8. The resulting recommendation involves modeling of the psychometrics into a gamer archetype as noted in Figure 9.

TGD's API allows for seamless integration with any game, regardless of genre or platform. This flexibility ensures that game developers and recruiters alike can leverage TGD's psychometric assessments to evaluate players' abilities. The API can capture data from a wide range of

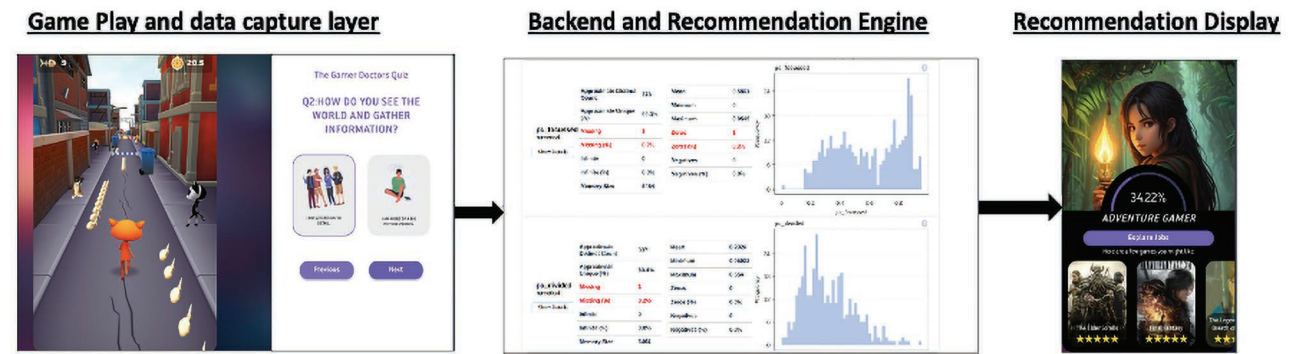


FIGURE 7. TGD workflow.

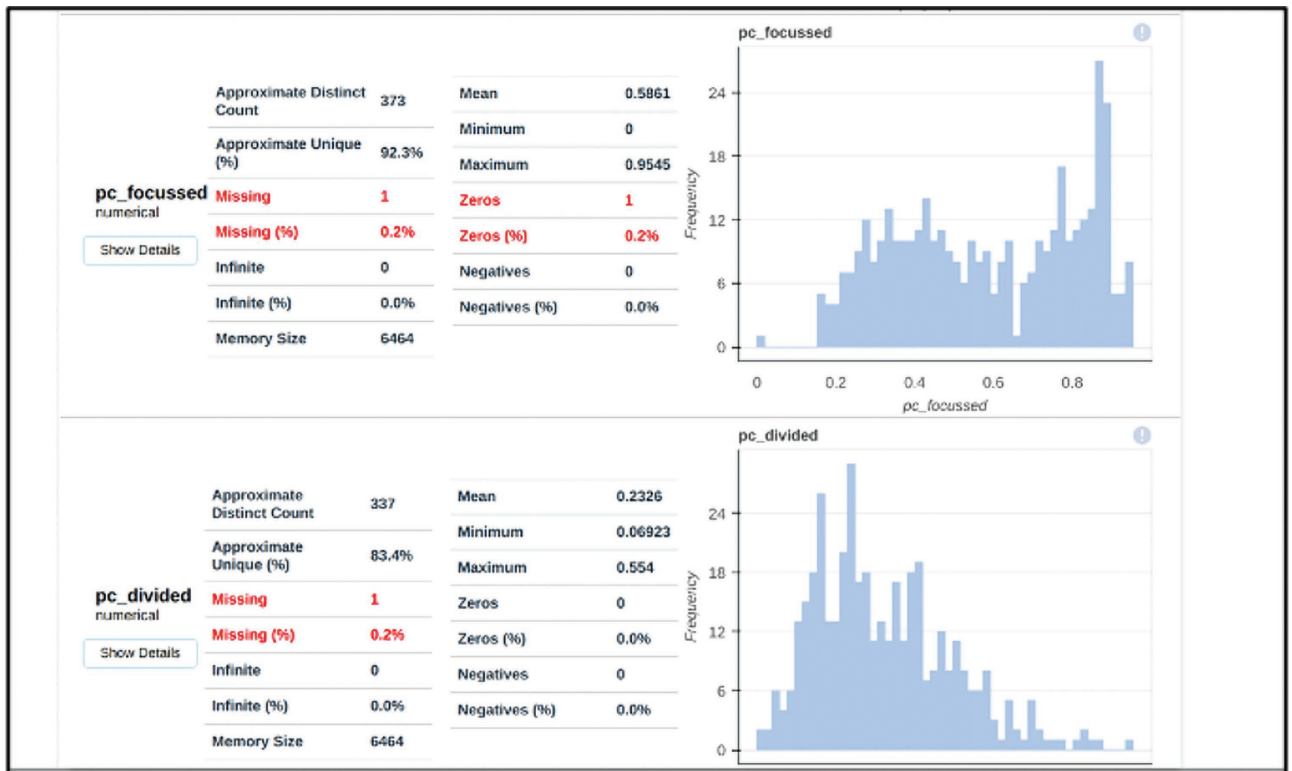


FIGURE 8. TGD real-time passive capture of player multi-tasking capabilities.





FIGURE 9. Game skills to job site mapping.

## COMMENTS?

If you have comments about this article, or topics or references I should have cited or you want to rant back to me on why what I say is nonsense, I want to hear. Every time we finish one of these columns, and it goes to print, what I'm going to do is get it up online and maybe point to it at my Facebook (mikezyda) and my LinkedIn (mikezyda) pages so that I can receive comments from you. Maybe we'll react to some of those comments in future columns or online to enlighten you in real time! This is the "Games" column. You have a wonderful day.

games, offering valuable insights into cognitive and perceptual skills across diverse contexts and simulated environments.<sup>7,8,9</sup>

Once player archetypes are generated, TGD suggests career paths based

on their innate and game play skills. Research shows that individuals' performance in tasks like gaming correlates with their ability to succeed in professional domains requiring similar competencies.<sup>11,12,13,14,15</sup> For example, players excelling in puzzle-solving games may have strong analytical capabilities suited for careers in data science or software development, while those who excel in coordination-heavy games may be more suited for hands-on, precision-based professions.<sup>11,12,13,14,15</sup>

Game-based psychometric assessments represent a significant advancement and opportunity for human resources. By providing a more nuanced understanding of candidates' abilities, TGD's platform allows human resource (HR) professionals to move beyond traditional assessments and gain insights into a candidate's cognitive and perceptual capabilities, aligning recruitment strategies with the digital habits of Gen Z and Gen Alpha.<sup>10,13</sup> These developments reflect broader trends in HR, where AI and machine learning are increasingly used to optimize talent acquisition and development.

## INITIAL RESULTS AND POTENTIAL FUTURES

TGD's initial results have shown that its system effectively identifies players' strengths and suggests appropriate career paths. However, challenges remain, such as addressing cultural differences in gameplay styles, which can impact how psychometric data are interpreted across populations. Furthermore, the reliance on gaming as an assessment tool may introduce bias against those unfamiliar with specific game genres, limiting the system's applicability to nongaming populations.

Looking forward, future iterations of TGD could integrate more comprehensive assessments, including emotional and social intelligence, to provide a holistic understanding of a candidate's capabilities. As game-based recruitment tools evolve, they could become key components of a data-driven, personalized recruitment ecosystem.

The evolution of game-based recruitment has made a significant leap from *America's Army*, which pioneered the use of a single,

purpose-built video game for military recruitment. While *America's Army* successfully demonstrated the potential of gaming to attract and engage talent, platforms like TGD represent a major advancement by enabling the passive capture of cognitive and perceptual data from any video game. This flexibility is revolutionary, expanding the scope of game-based recruitment beyond a single environment to reach millions of gamers across genres and platforms.

TGD's ability to integrate seamlessly with any game allows recruitment to assess a far wider range of skills, capturing diverse cognitive and perceptual abilities across various gameplay scenarios. Whether players are solving complex puzzles, making rapid strategic decisions, or demonstrating precision in action-based tasks, TGD identifies key traits and matches them to relevant career paths. This shift democratizes the recruitment process, making it applicable not just to the military but to industries across the board that seek to leverage the talent of digital natives like Gen Z and Gen Alpha.

By unlocking the potential of any video game as a recruitment platform, TGD heralds the future of recruitment—one that is inclusive, scalable, and tailored to the unique skills of digital natives. As gaming becomes a dominant part of everyday life for younger generations, these tools will transform how we identify and nurture talent, mirroring the foundational success of *America's Army* but vastly expanding its impact and applicability across diverse sectors. Through game-based assessments, we stand on the cusp of revolutionizing talent acquisition, fostering a more personalized and data-driven approach to developing the workforce of tomorrow. 

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#### REFERENCES

1. R. Nichols, *America's Army and the Recruitment and Marketing of Games*. Durham, NC, USA: U.S. Army Research Office, 2010.
2. M. Zyda, "Weapons of mass distraction - the America's Army Game at 20," *Computer*, vol. 55, no. 7, pp. 112–122, Jul. 2022, doi: [10.1109/MC.2022.3169388](https://doi.org/10.1109/MC.2022.3169388).
3. Steam Powered. "America's army: Proving grounds." Steam. Accessed: Nov. 8, 2024. [Online]. Available: [https://store.steampowered.com/app/203290/Americas\\_Army\\_Proving\\_Grounds/](https://store.steampowered.com/app/203290/Americas_Army_Proving_Grounds/)
4. L. M. Carrier, N. A. Cheever, L. D. Rosen, S. Benitez, and J. Chang, "Multitasking across generations: Multitasking choices and difficulty ratings in three generations of Americans," *Comput. Hum. Behav.*, vol. 25, no. 2, pp. 483–489, 2009, doi: [10.1016/j.chb.2008.10.012](https://doi.org/10.1016/j.chb.2008.10.012).
5. V. J. Shute and M. Ventura, "The power of play: Designing video games that foster learning," in *Trends and Issues in Instructional Design and Technology*, New York, NY, USA: Routledge, 2013.
6. C. S. Green and D. Bavelier, "Action video game modifies visual selective attention," *Nature*, vol. 423, no. 6939, pp. 534–537, 2003, doi: [10.1038/nature01647](https://doi.org/10.1038/nature01647).
7. D. Bavelier, C. S. Green, D. H. Han, P. F. Renshaw, M. M. Merzenich, and D. A. Gentile, "Brains on video games," *Nature Rev. Neurosci.*, vol. 12, no. 12, pp. 763–768, 2011, doi: [10.1038/nrn3135](https://doi.org/10.1038/nrn3135).
8. I. Spence and J. Feng, "Video games and spatial cognition," *Rev. Gen. Psychol.*, vol. 14, no. 2, pp. 92–104, 2010, doi: [10.1037/a0019491](https://doi.org/10.1037/a0019491).
9. Y. Ahmed et al., "Democratizing healthcare in the Metaverse: How video games can monitor eye conditions using the vision performance index: A pilot study," *Ophthalmol. Sci.*, vol. 4, no. 1, 2023, Art no. 100349, doi: [10.1016/j.xops.2023.100349](https://doi.org/10.1016/j.xops.2023.100349).
10. R. E. Mayer, *The Cambridge Handbook of Multimedia Learning*. Cambridge, U.K.: Cambridge Univ. Press, 2019.
11. J. P. Gee, *What Video Games Have to Teach Us About Learning and Literacy*. New York, NY, USA: Palgrave Macmillan, 2007.
12. E. Adams, *Fundamentals of Game Design*. Berkeley, CA, USA: New Riders, 2010.
13. I. Granic, A. Lobel, and R. C. M. E. Engels, "The benefits of playing video games," *Amer. Psychologist*, vol. 69, no. 1, pp. 66–78, 2014, doi: [10.1037/a0034857](https://doi.org/10.1037/a0034857).
14. J. P. Gee, "Learning by design: Games as learning machines," *Interactive Educ. Multimedia*, vol. 2, no. 1, pp. 15–23, 2005, doi: [10.2304/elea.2005.2.1.5](https://doi.org/10.2304/elea.2005.2.1.5).
15. J. Gackenbach, *Video Game Play and Consciousness*. Commack, NY, USA: Nova (Science Publishers), 2012.
16. M. C. Moe et al., "International Olympic Committee (IOC) consensus paper on sports-related ophthalmology issues in elite sports," *BMJ Open Sport Exercise Med.*, vol. 9, no. 3, 2023, Art no. e001644, doi: [10.1136/bmjsem-2023-001644](https://doi.org/10.1136/bmjsem-2023-001644).

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