Innovation of Talent Quality Evaluation Based on VR Big Data

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Abstract. With the advent of the era of big data, it brings new development to the talent quality evaluation most closely related to data in human resource management. Compared with the real world, the immersive experience brought by virtual reality technology makes the evaluation means more perfect, and effectively avoids the subjective social expectation effect and human error brought by individual and test tools. The combination of big data and virtual reality fuzzy sets and other algorithms in big data mining are used solves the problem of inaccurate traditional evaluation tools and single data dimension, has a huge impact on the traditional talent evaluation concept, makes the evaluation data dimension more comprehensive, the results break through the time limit, and predict the future development behavior of talents in a dynamic and continuous way.

Keywords: VR · big data · Talent quality assessment · fuzzy sets

1 Introduction

Virtual Reality (VR) is a computer simulation system that enables users to perform a three-dimensional stereoscopic virtual environment experience with specific devices [1]. And immersive virtual reality can integrate the virtual world to interact with various sensory stimuli such as vision, touch, and hearing provided in the real environment [2]. The 2019 World VR Industry Conference was held in Nanchang, the theme of "VR makes the world better——VR + 5G to open perception new era", many VR experts in the field and many enterprises, indicating the world attention to VR intelligent industry, VR as an emerging technology, from medical and health care, industrial manufacturing, landscape design, education and teaching industries, people's interactive experience in simulated virtual reality environment is not the visual impact of technology blockbuster [3]. VR technology is characterized by human-computer interaction, immersive experience and promoting cognitive development, where visual simulation is its important interaction intermediary, and through 3D scene simulation helps learners in immersive experience and learning, allowing learners to produce a strong perceptual usefulness. The interaction of virtual reality is based on the real world, making the virtual world connected to the real world, arouse understanding and thinking through the feedback of learners in the
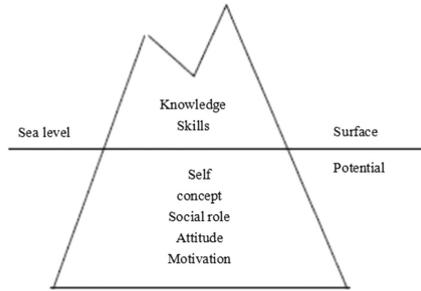
Fig. 1. The iceberg model

virtual world, through the virtual reality technology, build immersive scenes, improve the degree of interaction and deepen the depth of learning [4].

"Under the industrial society, who will master big data, a 'free' energy, will take the initiative." This is proposed by General Secretary Xi Jinping, so what is big data? How is it different from traditional data? From the literal point of view, big data is a large scale of data, in the academic circle, big data is known as huge data refers to a technology and service state, it for large data, distribution, diversified form identification, collection, storage and analysis, to extract the internal connection, new value and new performance, is the traditional data processing software cannot handle the large and complex data set. In other words, the traditional search is to search for data in the existing data, and then cross integrate the data in the database or search the data consistent with keywords, and the mining of big data is the collection of data required for collision from the existing data, from various kinds of data trends, text mining and deep learning, so as to obtain new data and future trends. In fact, as early as 1980, Alvin Toffler elaborated big data, but until the nearly 20 years, the concept of "big data" has been widely concerned [6]. Since 2018, as many as 300 policies issued in the big data industry, the big data management center, which shows that big data related industry is attracting wide attention from the government, and since 2019, with the development of 5G concept, the continuous innovation of the Internet of Things technology, big data technology mature, the big data industry also continues to grow rapidly [7].

With the rapid development of big data technology, the field related to data also began to gradually use this complex and sophisticated tool. Application in the field of professional quality evaluation comes from multi-source heterogeneous data acquisition called big data because it has to meet five V characteristics: Volume, Variety, Veracity, Value and Velocity. In other words, there is a large number of low value density and high processing speed. The emergence of virtual reality provides a strong support for the convenient and effective access to the evaluation of big data Figs. 1, 2, and 3.

Talent quality evaluation as a kind of psychology, management, computer science, education and organizational behavior as the basic comprehensive method system [8], its "quality" has two layers of interpretation, in the narrow sense, we want to explain from physiology and psychology, it refers to have certain characteristics, it is the innate condition of individual development, is through genetics, which determines human quality in nature [9], and in a broad sense, it is a comprehensive concept, it from physiological

and psychological attributes to social attributes, including human thoughts and cultural literacy, is a relatively comprehensive definition [10]. In talent quality evaluation "quality" usually refers to the psychological quality, we can see from the iceberg model, the quality including explicit and hidden two parts, above the sea level is relatively easy to investigate and measure knowledge and skills, and under the sea level is not easy to observe and extract implicit quality, including character, values, motivation, personnel quality evaluation is for a specific object, comprehensive use of a variety of measurement methods and means, for its ability, skills, more comprehensive evaluation of personnel quality [11, 12].

VR technology itself has natural advantages for big data acquisition. In the modern evaluation of VR big data technology, it is mainly based on the characteristics of VR immersion, multiple perception and interaction, integrating virtual elements, game thinking and virtual reality mechanism into the traditional evaluation technology, and combined with the big data 5V attribute, which constitutes the main channel of VR big data collection. Compared with the traditional evaluation, in a high-immersive environment, the experiencer can get infinite proximity to the experience in the real environment, so some subconscious actions and reactions can reflect the real attributes of the experiencer.

Big data talent evaluation based on VR refers to the integration of engineering psychology, behavioral science, VR technology, and large data, using sensitivity analysis, statistical analysis, fuzzy set method, decision tree method extracted from large, incomplete, noisy, fuzzy and neural network data. For example, applying the feed-forward data mining algorithm of neural network to evaluate big data and evaluation results can effectively improve the accuracy of the evaluation prediction results.

2   Problems Existing in the Traditional Evaluation Methods

Traditional talent evaluation method usually includes resume analysis, paper and pen examination, psychological test, scenario simulation, evaluation center technology, it takes the continuity of human behavior as the premise, to people's past behavior and predict the future, and with the arrival of the era of big data, the development of emerging technology, the disadvantages of traditional evaluation methods has constantly emerged.

2.1   Backwardness of Evaluation Concept

In the era of people-oriented, talent evaluation is to certain technical means and methods, to explore human ability and characteristics, based on the past, static behavior, the use of fixed stimulation to obtain single, fixed and structured information, the purpose is in the pursuit of precision and correlation, rather than from the overall perspective, the overall investigation of individual behavior data. From the perspective of sampling data junction points, the traditional evaluation is based on the past that has occurred, only the specific investigation points, and the data obtained is also isolated. In the rapidly developing modern society, in fact, we pay more attention to the "predictive" brought by the evaluation. We should comprehensively investigate the comprehensive interaction behavior of individuals from the overall perspective of view, so the traditional talent evaluation concept can no longer meet the needs of modern talent evaluation.

2.2 Inaccuracy of the Evaluation Tool

Traditional talent evaluation by giving the individual a stimulation, the stimulus is usually shown by the paper-pen questionnaire or problems in the situation, these stimuli are experts after repeated selection and design, through the individual response to the stimulus, examine the correlation between the individual evaluation results and the occurrence conditions, which makes the shortcomings of the traditional evaluation tools obvious [13]. First, the information obtained by these stimuli must be structured, and the expert evaluation of this unstructured evaluation has a strong subjective initiative, easy to appear the first cause effect, to greatly reduce the reliability and effectiveness of the evaluation. Second, the traditional evaluation tools are obviously homogenized, the stimulation is fixed, the lack of innovation, the recognition of the human response is limited, and it cannot form enough attraction to the outstanding talents. Third, the extensive use and diffusion of traditional evaluation technology, increased its exposure, lead to the exposure effect, make stimulation more easy to be identified, the individual evaluation tools more and more familiar, master level is higher and higher, so the authenticity of the reaction is questionable, the individual is likely to use skills to camouflage, unable to distinguish the individual ability and level, the evaluation of reliability and validity brings huge impact. Fourth, more and more people criticize the gradual examination of traditional evaluation, which is easy to cause individual examination anxiety. Such examination anxiety affects its memory, attention and cognitive performance, thus affecting the results. Many questionnaires are hundreds of questions, which will make individuals feel tired, and the reliability of the results cannot be guaranteed [14].

2.3 Single Dimension of the Evaluation Data

Traditional evaluation usually with random sample and fixed stimulus, examine the current state of the individual, random sample generally provides small sample data, through fixed stimulus collection fragmented data, the way collected data is relatively rough, established quality model is fuzzy, general, with single-dimensional evaluation means to evaluate multi-dimensional individuals, is obviously very difficult. In the era of paying attention to quality-oriented education, we pay more attention to the comprehensive investigation of individuals. Traditional evaluation, due to the uniqueness of data collection, cannot conduct a comprehensive investigation of people's behavior, character, ability and other aspects [15]. The individual is the internal and external unity, the internal hidden quality will be shown through explicit behavior, the traditional evaluation of the individual into a verifiable index, so that the individual and the evaluation standard relative to evaluate the quality of people [16]. Although the traditional way is able to collect relevant data through a specific stimulus, this data is not complete and the results of the evaluation are not enough objective, accurate and impartial.

3 Innovation Brought by VR Big Data to Talent Assessment

3.1 Advanced Nature of Technical Means

The talent quality evaluation based on VR big data is based on the traditional evaluation, and the combination of big data technology achieves the needs of multi-dimensional

configuration and big data interaction. The VR device combines individual and virtual scenarios to give individuals a highly immersive experience in a gamified way. In the process of interaction, individuals can communicate effectively with the virtual world through human natural ways such as actions, behavior, gestures, and language. In the virtual world, the individual behavior is fragmented data collected in reality, such as individual action trajectory, solution selection, number of tests, selection of items and interactive game order, massive fragmented data, using dynamic long-term collection, although there are error problems, but the data has little impact on the results, combining the principle of behavioral science, psychology and management, we can obtain effective information about individual values, and thinking logic. In the virtual situation, it is difficult to distinguish whether it is in the virtual environment or real environment, make its behavior closer to the daily behavior, to avoid the subjective social expectation effect and human error, the environment of the test will affect the accuracy of the evaluation results, the environment here includes both the individual psychological environment and includes the individual's physical environment. The gamification experience brought by VR takes the link in the game as a stimulus to the individual, obtains the performance behavior of the individuals in the stimulation scene, and then evaluates the implicit qualities such as the individual's ability, character, values and achievement motivation. The talent evaluation under VR big data effectively avoids the shortcomings of insufficient credit validity and obvious homogenization brought by the traditional evaluation, and collects unstructured data in diversified ways, so as to give more real, effective and comprehensive information.

3.2 Prediction of the Evaluation Results

Big data is not a simple superposition of the data, It promotes shifts in individual cognition and ways of thinking, Talent evaluation under the background of VR big data focuses on all the data, With the continuous maturity of data mining, storage and application technology, The behavioral data collected by VR is even more comprehensive and objective, it transforms the talent quality assessment from a static profile to a dynamic integration, continuity behavior data of individuals collected through VR, let the evaluations exist not just at a point in time, But on a continuous timeline, Let's evaluate individuals from a historical perspective, And this evaluation is at the essence through the surface, From the knowledge and skills directly shown by the individual behavior, to see the motivation, values and character hidden in the body. The evaluation results from the perspective of big data are no longer simply pursue relevance, but pay more attention to predictivity. The traditional evaluation is to evaluate the past standing at the current time node, and the evaluation based on big data is the behavior to predict the future development of talents [17], more forward-looking, it breaks through time constraints to understand and explain the changing trends in individual behavior and quality under the influence of time and environment.

3.3 Multidimension of the Evaluation Data

For multidimensional data mining processing generally at measurement points are divided into beginning, determine the purpose of data mining and according to the

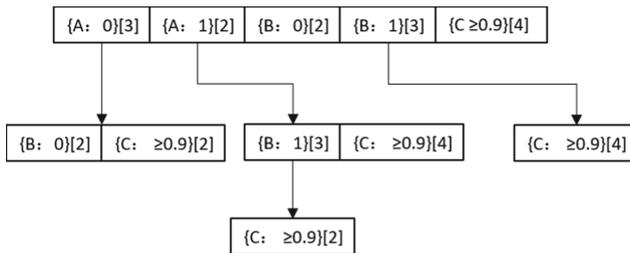| Set	Itemsets	Candinality
L[k]	{items}[support]	# L[k]
L[1]	{A: 0}[3] {A : 1}[2] {B: 0}[2] {B : 1}[3] {C: ≥0.9}[4]	5
L[1]	{A: 0, B: 0}[3] {A : 0, C: ≥0.9}[2] {A: 1, B: 1}[3] {A : 1, C: ≥0.9}[2] {B: 1, C: ≥0.9}[4]	5
L[3]	{A: 1, B: 1, C ≥0.9}[3]	1

Fig. 2. Fuzzy set conversion

Fig. 3. Data mining process

characteristics of the data types and data function choose corresponding algorithm, after purification and transformation of data sets in data mining, and to explain and evaluate the results of data mining, converted into will eventually be evaluation experts agree the knowledge logic. Taking fuzzy association rules of fuzzy set method as an example, the association between attributes becomes the association in the fuzzy sense after the transformation of the attribute values in the evaluation large data source in the fuzzy concept, and the association rules formed are fuzzy association rules.

Different from the small sample data analysis of traditional evaluation, VR big data evaluation through the situational and gaming way, let individuals invest wholeheartedly in multi-dimensional scenes, so as to evaluate the real quality, gamification scene enables individuals to avoid exposure effect and examination anxiety, Emphasizing the efficiency of obtaining individual quality information, Easier to stimulate the individual's real behavior in the social environment [18]. In the evaluation process, stimulation, as an external influence factor to obtain data, applies different stimulation behaviors to the individual, which will accept partial stimulation and produce heterogeneous avoidance or approaching behavior response, from which the evaluation subject can infer the behavior elements and quality characteristics of the evaluation individual. Using the game or game elements provided by VR as the stimulation applied to the individual, can obtain consciousness and unconscious level of information in the stimulation process,

the information is inadvertently displayed diversified, unstructured, multi-dimensional information, including individual behavior trajectory, voice tone, posture, logical selection and other content, the combination with traditional theory can more clearly show the individual character, interest, attitude, motivation and other qualities, let us evaluate the individual in a more comprehensive way.

4   Conclusion

In conclusion, the sum of human capital as individual abilities, skills, experience, and knowledge in the context of informatization [19]. Is an important component of social and economic development [20]. For the overall development of the society, the construction of the current era needs innovative and technical talents. For enterprises, human capital is the core competitiveness on which enterprises survive. The development of contemporary Internet technology provides favorable means for the high-quality and efficient development of human capital, so that technical means and human capital can achieve coordinated development. Talent evaluation as the field of human resources and the part of the most closely data, big data to talent evaluation is not only the means, way and tools is also the innovation of thinking mode, thinking logic and ethical norms, computer, mathematics and talent quality evaluation, the scientific innovation and development of talent evaluation technology, the combination of VR and big data let the traditional talent evaluation towards the direction of dynamic, comprehensive, accurate and intelligent development.

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