Blockchain Technology to Support Employee Recruitment and Selection in Industrial Revolution 4.0

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Abstract Blockchain will come to pervade the business environment, bringing huge implications for HR and the workforce. There was also a sense that technology has eroded trust in recent years, especially with the growth of cyber risks, blockchain presents a way to use technology to win back that lost trust. HR functions need to start to include blockchain alongside other emerging technologies in formulating their digital strategy. Assessing the potential blockchain to enhance efficiency and effectiveness should be considered alongside the broader implications for the future of work. Having identified and unpacked the problem to be solved, a good next step is to start to create prototypes that can develop into proofs of concept (POCs) that will target the most valuable case usage. This article develops the concept of blockchain technology application in the field of human resource management, especially in the employee recruitment and selection process. The benefit from HR blockchain is targeting productivity gains. The enhanced ability to match people's skills and performance to jobs would provide an uplift to productivity. Small and medium-sized enterprises (SMEs) may benefit particularly. The burden of finding and recruiting the right talent is especially difficult for smaller businesses, and anything that can help them do this more effectively and efficiently will boost their productivity. Hence, blockchain will simplify the process of employee selection and recruitment by helping to identify skills, knowledge, and experiences of potential candidates that are validated accurately. In the e-HRM context, the implementation of the blockchain system has the potential to improve the process of human resource management (HRM), specifically in the selection and recruitment process through screening of best candidates.

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1 Introduction

The entry of the Industrial Revolution 4.0 era, where the digital era continues to develop, is no exception in the system of employee recruitment at companies. The old manual recruitment method has begun to be abandoned, replaced with a database-based digital system. It is not impossible in the next few years, the limited manual recruitment method has begun to be abandoned and shifted to a more efficient digital-based recruitment trend, and everything will change into an integrated system called blockchain. Blockchain is a distributed ledger (open ledger) that is open and can record transactions between two parties efficiently and in a way that can be verified and is permanent. As quoted from the book Blockchain Revolution [1], blockchain is a digital ledger of uninterrupted financial transactions that can be programmed to record not only financial transactions but also everything of value. Blockchain is a technological breakthrough that creates trust through consensus by ensuring that all parties authorized to access the blockchain agree with any additions they make so that the data is guaranteed to be valid.

In the digital or e-HRM context, there is potential to improve the process of human resource management (HRM) using the blockchain for job screening, credentials and verification of education, contracts, and worker payments [2, 3]. That is, individual data such as education and work history can be stored and interact safely in digital ledgers in real time. This is an innovation that can raise high expectations for HRM so that every organization successfully adopts and applies it in the Industrial Revolution 4.0.

Interestingly, in the blockchain technology system, every slightest change must be verified in advance by the network. This means that all data entered is trusted and passes the authentication process. If there is one change, then the change will be updated to everyone who has access to the database. Conversely, old data storage systems tend to be centralized on one computer and run the risk of being lost or damaged. Databases stored in blockchain are error-free, transparent, and safe because every data is verified. That means, companies can get comprehensive detailed information.

During this time, one of the most popular blockchain technologies is bitcoin where the application of this technology is in the financial aspects of payment and recording. But actually, this blockchain technology has begun to develop and researchers have begun to explore the possibility of this technology being applied to the human resource function. This article focuses on the implementation or application of blockchain technology in its function in the field of human resource management, especially in the process of recruitment and selection of employees in the company. One way in which blockchain technology can simplify the selection and

recruitment process is by helping to identify the experience and skills of potential candidates who are validated accurately.

2 Blockchain for Recruitment Tool

Recruitment and selection are one of the most important things in a company because this process involves the selection and placement of the most appropriate employees among the best for the continuity of the company's activities in creating company value. Recruitment is the process of attracting a group of candidates to a certain position, followed by a selection phase [4]. Recruitment involves actions and activities taken by an organization to identify and attract individuals who have the ability to help the organization realize its strategic goals. Such activities must produce the desired set of candidates, increase their interest and be interested in the organization as employers, and increase the likelihood that they will receive job offers.

The recruitment and manual selection process still have many shortcomings because the results of the process obtained are still not in accordance with reality and require a long time in the data verification process. Stages of recruitment that are too long also make the assessment process and decisions taken take a long time. In the manual recruitment process generally, it still requires a third party in making decisions and that too will also add to the company's costs. Employee data that has entered the company system is usually the previous data, and the latest data is only stored in the software. But the resilience of stored data is less effective because the software contains a lot of data which will result in software overload and data can be lost.

There are cases that some job applicants send fake applications with fake training and diplomas, references, awards, promotions, and so on to intentionally exaggerate their qualifications and abilities. For example, Amazon pays an employee $5000 bonus to cancel a work contract (Amazon 2014). As a result, organizations end up paying large amounts of fees just to get rid of bad recruitment. Another survey revealed that 74% of employers had the wrong recruitment. It also identified that the skills of 45% of workers did not match their claims and 33% had lied about their qualifications [5].

The emergence of blockchain technology in the digital era can minimize the disadvantages of using manual recruitment in order to produce quality prospective employees. Unlike the old recruitment system that relies on manual records, in the blockchain everything is digitally connected. No more decision making that takes too long because the information is more organized. Thus, companies can conclude more quickly or compile shortlist of candidates who meet the criteria.

The cost during the recruitment process is also much cheaper and efficient. For example, there are prospective employees who register and 5 years previously had worked in the same company. Through the manual method, it could be that the data has been lost. But with blockchain, everything can be traced easily. The data verification process is guaranteed, considering the authenticity of the prospective

employee's profile is one of the most important things. The long process that has been done manually can be replaced with digital verification.

The phases or digital database-based recruitment processes will then become more concise, efficient, and effective. The data collection and verification process and the decision-making process are also expected to be faster and more precise.

Recruitment and selection stages using blockchain technology are as follows.

2.1 The Registration of Prospective Employees

In the first stage, prospective employees must register themselves by registering a curriculum vitae (CV) into the company's blockchain. Prospective employees are directed to fill in the registration form and input their data and CV on the company's blockchain Web site. After submitting, the prospective employee will automatically get a code from the system. Blockchain will check the validity of the inputted data by matching the code, and if a discrepancy is found between the data codes with one another, the blockchain will automatically declare that the data is invalid. Therefore, the data inputted by employees must be in accordance with the reality of the prospective employee's identity. This of course reduces the risk of data fraud and increases the time efficiency of data validation.

Furthermore, when the data has been submitted, prospective employees cannot replace the data unless there is a consensus between the prospective employee and the company. Illustration: A prospective employee applies for a job at company A and submits data and CVs on the company's blockchain Web site. Prospective employees no longer need to come to the company office and bring a hard copy of their data files. He only needs to submit data on the company's blockchain system to be further validated automatically by the system. When a prospective employee applies for a job at company A and submits data and CVs on the company's blockchain Web site, the data and CV he inputs state that he is a graduate of a well-known university and has participated in a certified apprenticeship program at a large company B. However, the company's blockchain system has detected invalid data which states that the university code mentioned is correct but the code for experience in a certified apprenticeship at company B is flawed or invalid. This means that the prospective employee is indeed registered with the university but he has never participated in a certified apprenticeship program organized by company B. Then this indicates an indication of data fraud committed by the prospective employee.

2.2 Administrative Selection of Prospective Employees

According to the HireRight employment screening benchmark report in 2018, 84% of applicants falsified data on their resumes. Blockchain-based credential verification systems can help reduce the time spent doing background checks, reduce fraud, and

build more trust in the recruitment ecosystem. File or data of prospective employees who enter the system will be validated using blockchain technology between companies and agencies that issue files or certificates. The certificate issuer can verify it automatically without the company asking for it, for example, validation of prospective employee's college data, work experience, educational history, self-identity, etc., using the blockchain. Blockchain directly gets data that is very real time and accurate because in this system data cannot be replaced or falsified without the knowledge and agreement of the blockchain users involved. This means that the blockchain can minimize fraud or falsification of data by prospective employees even though they have collaborated with agencies, governments, and so on.

When a prospective employee includes data stating that he is a fresh graduate of university A who graduated at the end of the year, the blockchain can detect the recorded data code which means there is a mismatch between the data code inputted by the prospective employee and the data code that is in the university blockchain system A. Furthermore, the blockchain found that the prospective employee was still a student and was scheduled to graduate at the beginning of the following year. Although the prospective employee cooperates with the university, the code on the blockchain is confidential and cannot be known and changed without any consensus between all elements of the blockchain. Moreover, any changes made are also recorded in the system automatically and are permanent.

In the blockchain system, the quality of recruitment and HRM activities is ensured by machine. This system can handle, store, validate, and rank information with complete transparency and security. The security of a blockchain system cannot be easily violated by hacking or system managers. Because the blockchain system is protected by multiple layered keys and hash encryption where the risk of information leakage and data changes is very low. Because this system is distributed, so changes in information can be easily tracked and original data can be retrieved.

2.3 Faster Decision Making

Blockchain technology simplifies and accelerates the decision-making process in the selection and recruitment process. In the process of finding the truth of the prospective employee's data already, it uses sophisticated technology and does not need to use a third party to search for data to go to agencies, companies, and governments to find the truth. Blockchain can store employment contract information such as applicants' electronic signatures, payroll details, security access codes, performance reports, and even psychometrics. Blockchain technology automatically verifies the correctness of its data through blockchain agencies, companies, and governments. Blockchain working time in data search takes approximately seven seconds to find out the truth. In theory, a candidate can be hired immediately and even can get a contract and their payroll number is set at a glance. Thus, the company can immediately see the results of real-time data obtained and can immediately make decisions as to who is determined as an employee who passes.

The application of blockchain technology enables companies and prospective employees to obtain and find out the results of the selection and recruitment process faster. With a short data input and validation stage, the company can quickly abort prospective employees who have data defects. Furthermore, companies can use the blockchain system to make decisions directly. With the validity of personal data and the competencies of prospective employees who have been confirmed, the system can directly communicate to the prospective employee whether he is accepted or rejected.

2.4 Placing Employees in the Right Position and Field

Reporting from a Career survey conducted in 2014, nearly 60% of job seekers misrepresent themselves on their resumes. This fact is certainly surprising to the company, but with blockchain technology, it allows the recruitment team to have instant, accurate, and complete access to all the potential and work history of employees. The truth of prospective employee data obtained from blockchain technology can be used as a reference for placing employees in their fields. For example, with the data of prospective employee A who is a graduate of a well-known university with a GPA of 3.90 and gets good grades in accounting courses, then prospective employee A can be employed or placed in corporate finance. Companies can trust data obtained by the blockchain system which can also be used as a reference for decision making and employee placement in accordance with their fields.

3 Conclusion

HR must begin to adopt this technology in line with the development of technologies in formulating their digital strategies. Assessing the potential of the blockchain in increasing efficiency and effectiveness must be considered along with the wider implications of future work. Eventually, employers will have a stronger and more trusted talent pool to recruit, and candidates will know that they do not waste time on reckless job searches. Through the blockchain, the HR department can introduce trust and transparency back to a broken system and meet the upcoming global talent shortages [6].

In the blockchain era, recruiters will be challenged to create more value than before. But they will also have better tools to help make it happen. The next right step is to start making prototypes that can develop into proof of concepts (POCs) and which will target high-value cases. It can be concluded that blockchain is a technology that has developed in the HR field. If the goal is a more complete and more cost-effective recruitment process, then it is time to use the blockchain. The race to seize competitive advantage through the blockchain has begun, and the HR function must participate in the race or the risk may be left behind.

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