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Role of blockchain in HR's response to new-normal

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Abstract

Purpose – This study aims to broaden the understanding of the blockchain for human resource (HR) managers through use cases. The study presents a plausible solution for HR professionals to effectively manage some of the core processes to focus on more strategic work and be a true HR business partner for the organization.

Design/methodology/approach – The study adopted a case research strategy. The case research strategy is well-suited to capture the practitioner's knowledge, mainly when focusing on contemporary events (such as COVID-19). Data collected from 12 tech organizations through telephonic conversations and the interviews were recorded and transcribed using NoNotes call recording.

Findings – This study identifies five use cases to streamline the critical processes, helping HR professionals such as certificates verification, skill mapping, payroll processing, data protection and performance management. These early use cases offer a plausibly superior alternative in managing critical HR functions and associated business processes with blockchain technology.

Research limitations/implications – Despite the growing number of blockchain applications, its usage in HR activities is limited. By extensive qualitative case study and data triangulation, the study integrates a resource-based view and unified theory of acceptance by explaining how blockchain adoption helps organizations use their internal resources and capabilities to gain a competitive advantage. The study presents five use cases and propositions that can act as building blocks for the HR department in adopting blockchain applications. Lack of empirical validation (quantitative rigor) of the propositions is the limitation and can be a future research scope.

Practical implications – Adopting new technologies is not new for HR managers. However, most of the technologies are disjointed applications, and therefore, the need for an all-pervasive solution assumes significance. Several of the blockchain concepts are still in the nascent stage. Thus, the study highlights the need for HR leaders to work alongside technical architects to create blockchain applications. Unlike other HR applications, blockchain can integrate all the employees, clients, vendors and businesses seamlessly. This study proposes research propositions that provide research directions for future research.

Originality/value – Academic literature on connecting blockchain technology with HR functions and applications is notably absent. This research can be considered one of the first academic articles connecting blockchain and HR processes.

Keywords Blockchain, Data protection, HR processes, Payroll management, Skill mapping, Performance management, Validation

Paper type Research paper

1. Introduction

COVID-19 has taken the world by surprise with a great deal of uncertainty and concern for people. It is an unprecedented shock to many working professionals worldwide (Papadopoulos *et al.*, 2020), impacting countries, governments, organizations and people.

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People are critical to every organization, and therefore organizations need to respond to employee's needs during pandemic and post-pandemic (new-normal) situations. As the world copes with uncertainty, the human resource (HR) professionals have been working to formulate their response to the crisis, ensuring the health, safety, employee well-being and client commitments. Unprecedented shocks such as COVID-19 not only throws challenges but also provide opportunities. While the organization leaders are pivoting on reopening and restoring the workplace, in this paper, we address how the HR professionals can be better equipped with technology to effectively manage some of the core processes to spend time on other strategic activities that require human intervention.

There is increased pressure on organizations to integrate technology into all business areas to deliver value to their clients (Papadopoulos *et al.*, 2020). Over the last two decades, organizations have embraced technologies mainly because of flexibility, security, efficiency, real-time processing, scalability and, more importantly, cost savings (Snell *et al.*, 2002; Shrivastava and Shaw, 2003). In the recent past, organizations have witnessed new technologies – robotic process automation, three-dimenisonal printing, internet of things and blockchain. Out of these, blockchain-based applications are considered one of the most significant breakthroughs in recent times due to their process efficiencies and security (PwC, 2017a). Blockchain is considered the most trending technology that significantly impacts businesses (Gartner, 2020a). On the contrary, blockchain is also a less widely understood technology due to widespread misconceptions about the blockchain (Leon *et al.*, 2017; Upadhyay, 2020).

In a world economic forum survey, 57.9% of the respondents predicted that 10% of the global gross domestic product would be on blockchain technology by 2025 (World Economic Forum, 2015). Gartner (2020b) predicts that blockchain will value $3.1tn by 2030. With blockchain gaining traction, there are new and emerging opportunities for organizations to deliver compelling solutions for their customers and employees. The department within the organization, which can benefit from blockchain technology, is the HR department. This paper aims to help business and talent leaders understand the blockchain's application and its advantages in the human resource management (HRM) domain.

2. Literature review

2.1 Blockchain applications and characteristics

Blockchain has become an industry buzzword that draws attention across industries, academia and practitioners (Zalan, 2018). Blockchain is a shared, decentralized, distributed ledger, tamper-resistant that facilitates recording transactions and tracking assets in a business network (PwC 2017a; Gupta, 2017; Hsiao *et al.*, 2018) that avoids double-spending (Nakamoto, 2008). The growing list of records is secured, linked and identified by a cryptographic hash are defined as blocks that are time-stamped. These blocks are connected chronologically through the nodes containing the hash of the previous block to create a blockchain (Crosby *et al.*, 2016). The developments in blockchain technology continue to appeal to leaders cutting across industries with data security and data integrity features (Dunham, 2017). Table 1 summarizes the application of blockchain across the industries.

Blockchain technology has the potential to disrupt the industries and improve communication and efficiencies within and outside the organizations by connecting all the parties involved in a single platform (Schatsky and Muraskin, 2015). Table 2 provides a summary of the key characteristics and advantages of blockchain.

Co-founder of Ethereum introduces the term "scalability trilemma," which indicates the difficulty of combining decentralization, scalability and security. Blockchain systems could

Application area	Description	References
Supply chain	Effective traceability and ability to check the entire journey of goods across the supply chain and thereby fraud prevention and fake across the supply chain	Perboli *et al.* (2018) Kshetri (2018) Biswas *et al.* (2017)
Real estate	Improvising the trust and preventing fraud in the real estate economy with disruption and blockchain	Veuger (2018)
Open manufacturing	Cross-enterprises framework leveraging the decentralized (distributed) framework based on blockchain to achieve a higher level of sharing of knowledge and services in manufacturing ecosystems	Li *et al.* (2018)
Enterprises and entrepreneurship	Enterprises to improve management models and operational capabilities; new business opportunities – driving innovation with open-source blockchain protocols	Pan *et al.* (2019)
Healthcare and clinical trails	Leveraging the consent workflow based on blockchain to achieve transparency for patients and traceability for stakeholders in health care	Benchoufi *et al.* (2017)
Digital rights management	Possible paths for the adoption of blockchain technology within the music industry and business models that support digital rights more effectively	O'Dair and Owen (2019) Elder (2017)
Energy sector	Enabling the prosumers to sell any excess reserves of energy (solar) back to the market using blockchain-powered apps	Hughes *et al.* (2019)

Table 1. Applications of blockchain across the industry

have at most two of these three properties. The scalability is identified as a challenge, especially for public blockchain, limiting 7 and 15 transactions per second. However, enterprise blockchains such as Hyperledger Fabric claim 3,500 transactions per second (Perboli *et al.*, 2018; Conti *et al.*, 2019). The scalability limitation is majorly applicable for financial transactions and not in the HRM domain and hence not focused in detail.

2.2 Technology in human resource management practices

Stone *et al.* (2015) highlight the need for technology in HR practices, indicating that the future of HRM depends on technology. Sivathanu and Pillai (2019) have recently studied the impact of technology and talent analytics on talent management and found that technology usage for talent management helps develop a high-performing talent pool, contributing to organizational performance. This indicates a need to leverage the technology effectively, although the usage of technology and software applications by the HR department is not a new phenomenon (Ball, 2001; Shrivastava and Shaw, 2003; Hendrickson, 2003; Townsend and Bennett, 2003; Poba-Nzaou *et al.*, 2018). These applications are primarily for internal purposes such as talent acquisition, talent development and talent retention (Sivathanu and Pillai, 2019).

There is a growing debate about the digital transformation at work and its ability to help HR managers in strategic decision making (Gainey and Klaas, 2008; Boudreau and Lawler, 2009; Marler and Parry, 2016). The extant literature indicates that HR technology, tools and software help significantly in reducing administrative work (Reddick, 2009; Florkowski, 2019), thereby enabling HR leaders to focus on strategic work to be a trusted advisor for the organization (Hussain *et al.*, 2006; Haines and Lafleur, 2008; Marler and Parry, 2016). However, other researchers (Bell *et al.*, 2006; Bissola and Imperatori, 2013; Strohmeier and Parry, 2014) argue that HR roles may become less appealing with the increasing emphasis

Blockchain characteristics	Description	Advantages (adoption drivers)
Open distributed ledger	This feature avoids centralized authority and multiple ledgers (makes the single ledger available for multiple parties)	Single source of truth
Decentralized networks	Avoids large central servers to store and maintain data and the parties that wish to take part in the transaction need not know each other	Transparency
Few intermediatory third parties	Private and public keys (accessibility to anyone who validates) make it possible to avoid third parties and helps in execution at a limited cost	Limited cost
Real-time updates	The feature of updating all the copies in realtime makes it useful in networks involving multiple organizations	Effective cooperation/ collaboration
Transition validity	Transactions histories will never be lost and the records will be retained by major nodes	Traceability
Consensus algorithms	Participants validate transactions independently, this consensus mechanism helps to avoid the fraudulent actions	Fraud prevention
Immutability of data	Hash algorithms, cryptographic digital signatures help in data integrity and avoid manipulation of the blocks	Enhanced security
Automation through smart contracts	Automatically executable scripts by participants when predetermined terms and conditions are met helps in increasing operational efficiency	Faster settlements
Time-stamped and chronological blocks	Blockchain is composed of chronologically-linked blocks. They let a user create analytics based on dynamic data	Analytics support

Source: Hughes *et al.* (2019), Pan *et al.* (2019), Perboli *et al.* (2018) and Treiblmaier (2018)

Table 2.
The key advantages of blockchain technology

on HR technology. The literature indicates that HR technology or HR self-service applications might decrease HR's importance. More importantly, the lack of control over the data might reduce perceptions of organizational importance (Shrivastava and Shaw, 2003).

COVID-19 has forced organizations to reinvent their business strategies, and therefore, aligning people's practices with digital technology assumes significance. To align HR priorities with the organizations' overall business objectives, the HR department must integrate, rethink the functional structures and enable a shift in focus to more strategic activities. It is a standard expectation from people to expect a similar line of experience in other areas and compare them with the HR function. Hence, it is essential to rethink and transform the HR function (PWC, 2017b; Gartner, 2020a). Thus, there is a need for significant adoption of new tools and solutions to follow the suit of the digital age with ERP, SAS and cloud platforms.

While there are many technologies to address HR needs, these applications are disjointed. Blockchain technology characteristics (Table 2) can be of significant value to the HRM domain. Though some of the functions of HRM are handled by enterprise systems (CRM/ERP), adding new features is expensive and enterprise systems have to go through massive amounts of customization – limiting their usage. Moreover, the interoperability issues among the enterprise systems are a major roadblock for data sharing. Another issue is the limited visibility, i.e. one step to their left or right in a typical supply chain set-up. More importantly, the company's "trust boundary" is limited to its own systems.

The blockchain technology solutions can integrate into existing ERP software. The suggested approach is every company can maintain its internal ERP system while joining one rule-enforced blockchain network. The availability of the data and business rules migrating to one trusted blockchain network will facilitate a win-win scenario. Overcoming the interoperability issues, an extension of the trusted boundary with greater visibility (transparency) are the major advantages of blockchain technology. The leading cloud CRM provider Salesforce launched a blockchain platform based on Hyperledger Sawtooth to facilitate building a blockchain network and apps integrated with CRM (Anthony, 2019; Mearian, 2019; O'Connell, 2019). Salesforce customers will even be able to create and share a blockchain object using the same process as they already do for any CRM data object in Salesforce without the need for writing code.

2.3 Research questions

We attempt to answer the following few pertaining questions related to blockchain in HR:

- *Q1.* Can blockchain offer protection against data tampering/data falsification?
- *Q2.* Can blockchain help in determining the accuracy of a candidate's work and education?
- *Q3.* Does blockchain automate and secure payments to contractors and vendors?
- *Q4.* Can blockchain seamlessly connect all the stakeholders such as employees, employers, vendors and clients?

Several organizations are working on the proof of concepts as they believe blockchain can play a pivotal role in accelerating the digital transformation initiatives across the organization (Gartner, 2020b). A key challenge for HR professionals is the ability to understand blockchain and its functionality. Academic literature connecting HRM processes with blockchain technology is notably absent in recent studies (Casino *et al.*, 2019; Upadhyay, 2020). Identifying and developing use cases for the technology seems a challenging task due to the perceived immaturity of the blockchain technology (Avital, 2018), lack of understanding of technology by HR professionals and the unavailability of skilled resources to develop and manage blockchain solutions (Daniel and Zhu, 2018). The current study aims to provide the HR community the finest discussion elements better to understand the firms' blockchain advantages and adoption motivation.

3. Research methodology

3.1 Approach

The study adopts the case research strategy. A case research strategy is a method mainly used in studies of information systems in which research and theory are at formative stages, in which the experience of actors and context of the action is essential (Benbasat *et al.*, 1987). Research in information systems is learned by studying the practitioners' innovations rather than providing the initial ideas. The case research strategy method captures the practitioners' knowledge and the knowledge accumulated through the trial and error process (Christenson, 1976). A case study is more suitable than other conventional methods used by information system research. The case study is justified more when the researchers have less a priori knowledge of the variables of interest and how they will be measured. Also, the case study is appropriate when the focus is on contemporary events. COVID-19 is a new experience where people have not experienced earlier and blockchain in its early implementation stages.

3.2 Unit of analysis

For the current study, the unit of analysis is groups. Accordingly, the research questions were framed to elicit information from the respondents. One of the essential criteria for the unit of analysis is the site selection. The research topic, characteristics of the firms such as organizational structure, geographic coverage and public or private, are to be considered for the site selection. Twelve technology companies were identified based on their industry publications and sought appointments with the various heads of HR functions. Organizations were chosen based on two criteria. First, these are tech organizations working on several proofs-of-concept. Second, these are also large organizations with more than 100,000 employees with global locations. The need to monitor, coordinate, and provide similar HR experience across the areas also becomes critical for these organizations. The study involved 12 focused group discussions, with a group size of 5–8 participants. Guest *et al.* (2006) suggest that 12 interviews of a homogenous group are adequate to reach saturation, and therefore the sample of 12 focused groups in the study is justified.

3.3 Data collection and data analysis

Interviews were recorded and transcribed using the NoNotes call recording and transcription platform. The questions included both-open ended and focused questions linking blockchain and HR processes. Case research suggests being meticulous in record-keeping so that the researcher collects every detail of the conversation. A critical component of the data analysis is the case writing based on the information collected covering the research objectives, questions, assumptions, results and conclusions.

Further, we extensively triangulated our data by corroborating findings from interview data with observations from secondary sources such as industry reports and trade and academic journals. The study has done a systematic scan of the published reports by several organizations and academic journals. Prokofieva and Miah (2019), in their paper blockchain in healthcare, conducted a systematic study of blockchain literature leveraging 14 journal databases. The current study extended the duration until June 2020; however, this study focuses on identifying potential blockchain applications for HR processes. The study identified 281 papers covering both the journal databases and industry reports. Papers were thoroughly verified to determine the linkages to HR processes. Although the search produced several linkages related to payment and payroll, academic papers linking to HR processes are notably absent. This study could be the first of such academic research connecting HR and blockchain. The study sourced 18 industry publications and several white papers and blogs connecting HR with blockchain. Keywords such as blockchain in HR, blockchain HR, blockchain and HR, blockchain and talent, blockchain and recruitment, blockchain and payroll and blockchain HR systems are used to search in databases, journals, blogs and other web sources. Such data triangulation strengthens the validity of the emergent theory.

The current study looked at the pre-employment phase, which includes validating certificates, skills and experience, placing the right candidate in the right place, and the post-employment period, including payroll processing, records management, data security and performance management. Out of the several jobs that HR as a department delivers, these activities are critical and core to the HR function, and hence, the study adopted these use cases. Figure 1 illustrates the five identified use cases/processes where HR can immensely benefit from blockchain technology.

Figure 1.
HRM use cases

4. Discussion

The recent developments in HR processes are predominantly technology-driven, calling HR managers tech-savvy (Lengnick-Hall and Lengnick-Hall, 2018). The present study examined the understanding of the blockchain by HR heads and its application in HR-related processes. Based on the respondents' information, five use cases have been identified and further vetted with the latest advancements.

4.1 Validation of certificates and employment history

Candidates in pursuit of the job often misrepresent, quote or falsify the data to improve their employment chances. A recent survey by CareerBuilder found that 75% of the candidates modify their resumes based on the specific job they apply for (CareerBuilder, 2017). As a result, HR professionals spend too many hours verifying the data submitted by candidates, such as education, skills, training and employment history. It has also become a challenge for organizations to verify educational details as educational institutions grow every year. One of the participants responded, saying:

> Candidates keep changing organizations, and every time they change jobs, their educational background, job details must be verified. It is time for the companies to develop a platform/blockchain that is difficult to have tampered with. Organizations can save both money and time during the recruitment process. As a result, the process can be completed quickly. There were several instances where candidates have falsified information in their CV's, and we only come to know after their joining. Till now, we have been relying on a CV, which the applicants modify as per the job requirement.

Due to a large number of applicants, large organizations employ third-party verification services, while small organizations spend a considerable amount of time verifying the details. These verifications happen after the employee joins, and the fees charged by third-party also differ based on the candidate's profile. One of the HR managers told:

> Currently, we employ a third-party agency to perform background checks. Most often than not, these background checks happen after the employee joined an organization. In case the background checks turn to be negative, the reporting managers do not want their team members to be removed as the member is already assigned a project, and hiring another employee is a time-consuming process.

Blockchain can help HR professionals through its secure data-sharing feature to verify the potential employee's credentials. Employers can view and check the candidate's data such

as education details, certifications and previous employer details. Upon successfully verifying the data, organizations can quickly release the offer letter, thereby saving significant time, effort and cost in the recruitment process. Concurrently, individuals can enhance their employability by voluntarily sharing their data with the recruiters as it improves employment opportunities and creates a culture of trust between the employee and the employers (PwC, 2017b). Candidates releasing a blockchain entry cross-signed by the university with the potential employers eliminates the need for background verifications saving considerable time. Another participant said:

> There are many organizations, be it small or large. While some organizations are bankrupted and lose their existence, others get merged or acquired. Besides, several shell companies would provide experience/services certificates for money. It becomes incredibly challenging to identify which company is genuine and which is not. If these certificates can be made digital on a blockchain, where both the credentials and the organizations are verified, they will solve many problems. Through blockchain, individuals can turn their documents, education into real value in the market, and this would immensely help the HR professionals to identify the right employee.

Further, the networking sites upon which candidates spend time updating their details also become obsolete, as blockchain transactions can store all the employment history. Massachusetts Institute of Technology (MIT) is piloting a project *Digital Academic Credentials,* that have a set of tools, software, and strategies to store and manage digital credentials (MIT media lab, 2018) that can be accessed by users with a specific key (Zielinski, 2018). In 2019, 111 graduates from MIT were given certificates as digital certificates. The University of Nicosia provides an open-source platform to issue and verify digital certificates without any dependencies on the issuing institution (University of Nicosia, 2020). In India, the government is planning to implement *IndiaChain* starting with 2020 graduates. Indian Institute of Bombay (IIT-B) and Delhi University explored the possibility of issuing digital certificates using the blockchain solution (Factor Daily, 2018). IIT-B established a center of excellence in blockchain Research. Several other institutes are still in the proof of concept stage, and the successful implementation of these institutions will pave the way for the other educational institutions to follow suit as the blockchain technology eliminates the intermediaries, vendors and recruiting agencies involved in the recruitment process, as the employer can independently verify the transactions. With the understanding of blockchain features and in light of the above qualitative evidence and observations, we posit:

P1. Distributed ledger (single source of truth) and transition validity features of the blockchain will positively influence the adoption by HR professionals for "validation of certificates and employment history."

4.2 Skill mapping

Skill mapping has been the core job for most HR professionals that is not a one-off exercise but a continuous activity. Mapping and positioning the right talent for the right job is arguably the most critical task in today's scenario due to the varied skills that the individual possesses. With many new technologies entering the workplace, it becomes more difficult to map these individuals to the right job. The pressure to withstand competition and stand out makes many candidates less than honest while documenting their resumes. In a survey conducted by Harris Poll, three out of the four HR managers caught a lie in candidates' resumes about their skills, education and employment history (CareerBuilder, 2017). This number has been on the rise with the *2018 Employment Screening Benchmark Report*

indicating that 85% of the employers caught candidates falsifying their skills and the job role in the current organizations (HireRight, 2018). Besides, employees invest significant numbers of hours in training outside the office, which often goes unnoticed. Participants commented:

> Employees take up several trainings and courses during the course of employment. Conducting training, consolidating reports and certifications is a hectic task for L&D professionals. While there are several in-house trainings conducted, employees also take up certifications outside organizations, which go unnoticed mostly, as there is no mechanism to capture these. We believe the L&D department can leverage blockchain to initiate, supervise, and conduct the training seamlessly. The moment an individual completes the training, their progress will be registered on the blockchain. HR can verify the data and maintain a decentralized digital record that can be handy while making decisions about an employee.

Fancy titles across different organization levels have also become challenging for HR professionals to align with the current organization's appropriate level. For instance, the highest level in an organization is managing director, while other organizations have senior/executive vice presidents at the top management. It is equally problematic for the candidates when another organization acquires their employer. Blockchain has the potential to record all these transactions, as no record can be deleted (Scott, 2016) but only can be modified and thus, even if the names of the employer gets changed, a blockchain solution can still map it to the preceding organization, thus helping the HR professionals to take quick action. Another growing concern among the business and HR leaders is the shortage of skills and ensuring that the organization has adequate resources to meet future demand. Another participant said:

> One area we are expecting blockchain to help us is credentialing the skills and archiving the information. This will help the organizations in decision making and mapping the right candidate for the right job. There are so many skills acquired by the employees in due course of employment that we are not aware of. Whenever we require new skills, we start looking outside rather than looking within the organization. We are hopeful that blockchain can bridge this gap.

The implementation of blockchain technology allows HR leaders to understand their employees' skills and strengths and access their learning records. It also helps them view the skills of all the potential candidates who have shared their details, thus enabling the HR leaders to be prepared for the future (PwC, 2015). Another participant recalled:

> One of the core jobs of HR professionals is to understand the current skillset and plan L&D strategies that will help to provide the skills required for the organization. Mapping real-time employees' skill set is a challenge. Blockchain can help us prepare for the future, ensuring that we have the right skills to take up new engagements.

With the understanding of blockchain features and in light of the above qualitative evidence and observations, we posit.

P2. Transition validity (retention of the records by major nodes) feature of the blockchain will positively influence HR professionals' adoption for effective skill mapping.

4.3 Payroll processing

Payroll processing happens to be the most time consuming and annoying task. A survey by total jobs (Burke, 2017) revealed that the HR department spends 90% of their total time on operations management, including payroll processing, overseas and cross-border payments

and tax, and managing regulatory compliance. As it amounts to a considerable amount of time, large companies outsource their payroll activities, including timesheets, data administration, health benefits, etc. These organizations spend 27% less time than other companies that manage payroll internally. While it is advantageous for the firms to outsource their payroll activities, maintaining the confidentiality and data security has been the biggest concern. Participants shared the sentiment about data misuse:

> We have outsourced all our payroll activities to a third-party for which we pay a significant amount of money. If the blockchain can help us verify the claims and make a timely payment, we would not outsource the payroll. There is also a danger in outsourcing as the employee's sensitive data is available with our vendors. Although we sign a non-disclosure agreement, we cannot write off the misuse. This will also help us coordinate with various functions such as finance, operations, facilities, etc.

Blockchain can identify the bank accounts, tax information using the identity verification process and process the payment and is particularly useful for paying gig economy/temporary workers on a real-time basis (Global Payroll Association, 2018). While large companies are exploring ways to integrate the existing systems into the blockchain, fintech companies such as Bitwage, Earthport and Chronobank have started to pay their contract workers using blockchain technology (Pymnts, 2016; Zielinski, 2018). Secured ledger features of the blockchain enable the parties to validate information related to the transaction and process instantaneously, thereby eliminating intermediary banks and third parties.

> The current payment systems are very complex. It becomes challenging while paying to onsite employees or ex-pats. There are so many intermediaries involved concerning international payments. If the blockchain can build that trust and bypass the intermediaries and the network, HR saves time and money through the intermediary changes. Moreover, the international workforce's trust increases when there is a direct transaction between the employee and the employer.

Further, blockchain can manage cross-border payments and employee mobility, including international expenses and international tax compliances (Pymnts, 2016; PwC, 2017b; Gartner, 2020b) by paying the employees in their local currencies. Transactions on the blockchain are digitally signed with every single transaction recorded in a shared ledger (Nakamoto, 2008). The ledger is replicated and shared among all the participants in the network whenever changes are made. Other copies of the ledger get automatically updated, and thus the shared ledger is considered the single source of truth (Gupta, 2017; Turner and Irwin, 2018). This will make faster approvals of claims, health benefits, payouts and other reimbursements instead of waiting for an extended period to get the claims processed. A participant responded

> Employees submit several claims as per their eligibility. We believe blockchain can help in quickly verifying the claims, process, and make the payment immediately. The current processes are cumbersome, where the employees need to wait for several days to get the money reimbursed. Apart from the regular claims, healthcare benefits can also be integrated into this, that way, the reimburse period can be minimized, more importantly, can eliminate paperwork. It is difficult for the employees to come to the office in the current pandemic situation and submit their claims. Simultaneously, there should be a mechanism that verifies the authenticity of the claims, and we believe blockchain can help in our endeavors.

COVID has impacted every organization, with several employees losing their jobs. Gartner (2020a) estimates that 32% of the employees are replacing their workforce with a contingent workforce. Although the contingent workforce offers greater flexibility, managing their

details, skills, timesheets and vendor reconciliation remains to be a significant challenge for the HR managers. Blockchain technology can be used to track contingent workers' timesheets, work and supplier invoice reconciliation. For instance, IBM is piloting a blockchain contractor management solution that automatically tracks the required data and makes the payment using smart contracts (Clint, 2020). Based on the consistency of the above observations and the understanding of blockchain features, we posit

P3. Enhanced security and faster settlement features of blockchain will positively influence its adoption by HR professionals in payroll processing (especially overseas and cross-border).

4.4 Data protection and cyber attacks

HR professionals handle high volumes of data, including bank details, medical records, employee performance, and personally identifiable information (PII). Other departments within the organization, third parties and vendors through emails and other mediums of exchange, often access this data. While the data is being shared for a purpose, cyber-attacks have become a significant concern for HR professionals. Ensuring that these parties use only the required data is a common concern across the organizations. Cyber-attacks have become unimaginative as they steal financial data, personally identifiable information and other valuable data of both the employees and the organization. In a report by Ernst and Young (2020), 59% of organizations faced material or significant attack due to which cybersecurity budget has increased over the past year. Thus, cybersecurity is the number one priority for organizations, particularly for knowledge-based/technology organizations.

> *The recent cyber-attacks were a witness to data theft and how important it is to secure the data. As an HR team, we get to collect a lot of information related to finance, health, banking, performance, disciplinary, and promotion related information, which is later used for a particular purpose. Safeguarding and maintaining the data is critical, given the rise in cyberattack cases. With blockchain, the data in the blocks are fully encrypted, and it would be difficult for hackers to decode the data. Unless the hackers have the private key, they may not be able to tamper with the data.*

Blockchain can address the risk as the data transmitted in the blockchain network is fully encrypted, thereby avoiding fraudulent activities that guarantee data confidentiality (Piscini *et al.*, 2017). Only the authorized individuals with the private key can access and decrypt the data encrypted on the blockchain. Operational resilience, data encryption, auditability, transparency, confidentiality, integrity, traceability, immutability and sustainability (Leon *et al.*, 2017; Gupta, 2017; Oh and Shong, 2017; Piscini *et al.*, 2017; Ravindra, 2018) properties of blockchain safeguard the data that is unsusceptible to cyber-attacks. A participant mentioned:

> Data of the employees and the organization is used for different purposes. HR are often reluctant to share the information required by the managers, as they opine that the data will be misused or will not have control over, once it is shared. With blockchain, only people with access can have access to the information, and since the transactions are time-stamped, it is easy to identify who has accessed and when. This way, we are securing the data and have access to the data without the mundane formal process of obtaining permissions.

With the implementation of the General Data Protection Regulation (GDPR) on May 25, 2018, the need for data security has assumed significance in the European context (EU GDPR, 2018) as non-compliance by the organization might attract penalties. GDPR protects and empowers the European citizens' data privacy and reshapes the way organizations

across the region approach data privacy. The nature of the blockchain is such that every transaction taking place will be published using technology. With the permissioned blockchain, the access is restricted; thus, only the trusted parties are provided access (Axon *et al.*, 2018; Banerjee and Joshi, 2017). One of the HR managers said:

> As an organization, we collect work-related sensitive data from the clients. Likewise, we also have our employees' confidential information, including their social security numbers. General Data Protection Regulation puts several restrictions on the client data emphasizing data compliance. With blockchain in place, clients can share their information over the blocks, and only authorized personnel can access the data. Likewise, employees, confidential data can also be put in the blocks, and that information will be accessed by only those who were provided access. Unfortunately, the data is all over the place now, for example, a candidate's personal details are present on a CV, when the candidate attends the interview, after the interview, interviewer leaves the room, and the papers are all over the place, there is a high chance that anyone can misuse their mobile number or email address. Hence, it is essential to safeguard the data in the best way possible.

Considering the above qualitative evidence and the understanding of blockchain features, we posit.

P4. Enhanced security features of blockchain will positively influence its adoption by HR professionals to protect the employees' sensitive information from cyber-attacks.

4.5 Performance management

Performance management plays a pivotal role in an individual's success as it is linked to an individual's compensation, recognition and career trajectory. The confidential report's method that was primarily used in public sectors to the most sought-after bell curve approach had undergone structural changes in evaluating employee performance. Organizations are continually searching for better ways to appraise performance; thus, several of them have replaced annual reviews. Frequent and real-time feedback, ongoing consultation, career development assumes significance in the new performance models (Buckingham and Goodall, 2015). To record all the coaching discussions and gathering feedback from multi-stakeholders is a hectic task for the HR managers and is a time-consuming activity. One of the HR managers mentioned:

> Every employee feels performance management as a critical aspect in his/her career because it is connected with promotions, salary hikes, recognition, and career progression. At the same time, there are many stakeholders whose input and feedback act as a lever for an individual's performance. HR managers spend a significant amount of time consolidating the reports of various stakeholders associated. We expect the blockchain to capture all of this information and have user access control so that the stakeholders do not see what others have filled until a final decision is achieved.

It is but natural for employees to work on multiple projects with various stakeholders. Obtaining feedback from all the stakeholders will reduce bias and subjectivity. The feasibility of HR professionals to collect input from all the stakeholders holds the center of discussion. Blockchain can be an alternative solution for performance management as it can reduce bias and bring in more objectivity. As individuals work on a project, the immediate supervisor can create a block that can be validated by all the stakeholders (client, team lead and peers). The block can be accessed by all the stakeholders allowing them to provide

feedback. All the blocks will be validated by giving a 360-degree view/accurate picture of the individual performance at the end of the year.

> Employees work on various engagements in a given year. It is difficult to obtain timely feedback despite the PMS in place. Instead, we can create a block that can be accessed by all managers concerned, who could provide feedback and areas of improvement. The moment an engagement is over, the assigned manager can provide feedback. In case the manager does not offer feedback, the system will automatically send reminders. This will save much time for HR managers and reduces a lot of paperwork. The information can be verified at any time, and the combined transactions make it easy for promotion decisions. Moreover, the current generation wanted instant and real-time feedback, which can happen over the blockchain.

Blockchain reduces the manual efforts and documentation and brings in transparency, reducing personal bias and subjectivity (Sekhar, 2017). Individuals will have access to their blocks, which they can view, at any given time, thereby providing real-time feedback on their performance. Employees not only change organizations but also move internally. The hiring manager can be provided role-based/user control access to view the blocks and understand the individual's performance in the previous teams, thereby making a right, fast decision. One respondent pointed out, telling:

> Every employee projects himself/herself as a good employee during the interviews. We are not aware of his/her performance in previous organizations. If every organization uses blockchain and creates a block for every individual, the same ID can be continued. The prospects of getting employed for a higher performer are more compared to low performers. Like the way we validate academic records, the previous organizations' performance can be confirmed on the blockchain application. Of course, there is a need to ensure the performance data is not accessible to everyone. It can be during the interview or at the time of application, and after the interview is over, the candidate may close the access.

Considering the above qualitative evidence and the understanding of blockchain features, we posit.

P5. Consensus algorithms and decentralized network features of the blockchain will positively influence HR professionals' adoption for holistic and transparent performance management.

5. Conceptual framework

Blockchain technology adoption is in its infancy stage; most organizations are yet to leverage its full potential. In the literature, various authors dedicated significant efforts in developing the technology acceptance models. Based on the insights from the qualitative inputs around the challenges faced by HR managers, the unified theory of acceptance (UTAUT) and its extension UTAUT2 seems suitable in understanding the blockchain adoption in the HRM (Venkatesh *et al.*, 2003; Venkatesh *et al.*, 2012). While the UTAUT/UTAUT2 explains the adoption, i.e. user behavior intentions and the subsequent use of technologies, a robust model requires modification in the case of emerging technologies. In the proposed conceptual model, we have integrated the resource-based view (RBV) for a comprehensive understanding, i.e. including motivation and adoption.

RBV complements UTAUT/UTAUT2 by explaining how blockchain helps organizations use their internal resources and capabilities to gain a competitive advantage. RBV suggests that organizations make rational choices shaped by the organization's internal economic context (Oliver, 1997). RBV defines an organization as a bundle of

productive resources that includes physical and human resources. They are the valuable, rare, imperfectly inimitable and non-substitutable resources that drive organizational competitive advantages (Barney, 1991). Figure 2 summarizes the proposed conceptual model. In this performance expectancy of blockchain, addressing the current HRM challenges is the key construct. The finer elements of the performance expectancy are summarized in figure 3.

As noticed in the literature, multiple business domains are actively exploring the blockchain. Considering the executives' novelty-seeking tendency and competitive pressures in the digital era, retained the "Hedonic motivation" construct of the UTAUT2 framework. This construct becomes vital as multiple parties involved in the network need to relish and continue in the blockchain network. The blockchain features of compatibility, control over the system map to the "Facilitating Conditions" of the UTAUT2 framework and hence retained. Open source development and entrepreneurship opportunities related to blockchain also facilitate its adoption. Considering the early stages of the blockchain, limited scope/evidence of the current study, few other constructs (i.e. effort expectancy, social influence, price value, habit) of the UTAUT2 framework were not included. The competitive advantage of the RBV

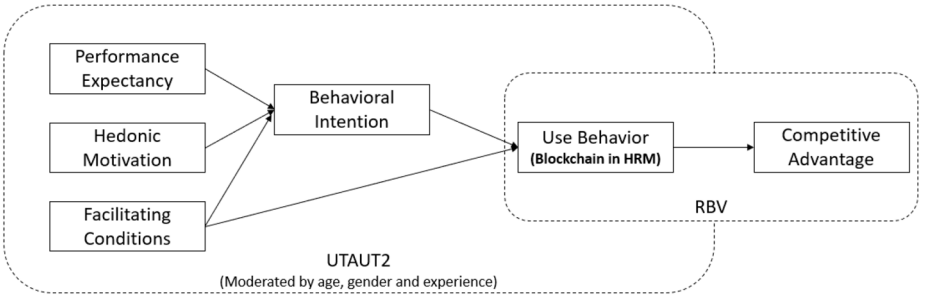

Figure 2.
Proposed model for blockchain adoption in HRM

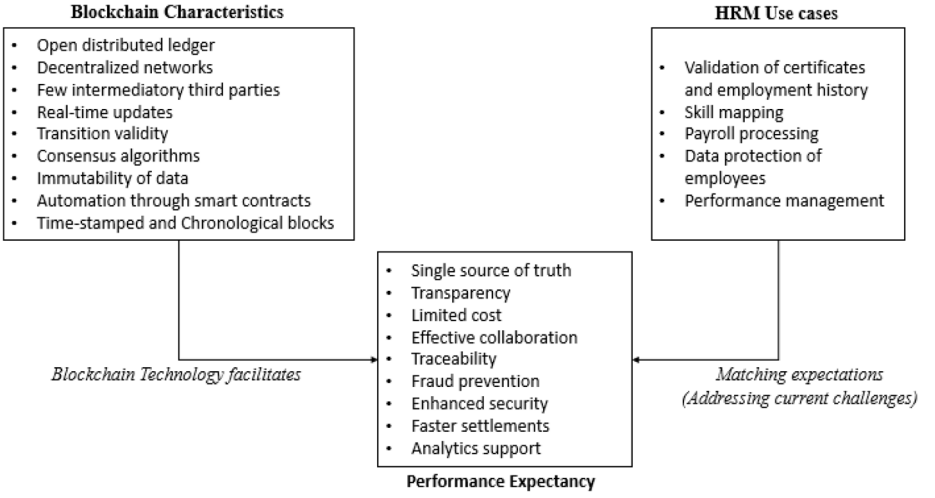

Figure 3.
Performance expectancy of blockchain for HRM use cases

retained as the blockchain can drive organizational competitive advantages through business process remodel (Pan *et al.*, 2019).

6. Implications, conclusion and future scope

6.1 Implications

In this paper, we develop a conceptual model to understand blockchain adoption in HRM practices. By leveraging the case study research and triangulation techniques, we contributed to the literature by doing an in-depth discussion of five key use cases of HRM practices along with appropriate propositions. In particular, we make four important contributions implications.

First, although blockchain has been considered for implementation in several domains and functions, it has received scant attention in human resource management. Therefore, this paper assumes significance, given the enormous potential of blockchain for HR processes.

Second, from a theoretical perspective, the study integrates a RBV and UTAUT/UTAUT2 by explaining how blockchain adoption helps organizations use their internal resources and capabilities to gain a competitive advantage.

Third, the study presents five use cases that can act as building blocks for the HR department in adopting blockchain applications. The study extends the understanding of the blockchain characteristics and how they match the performance expectancy of the HRM use cases, based on which future researchers can develop new use cases. In addition, the study offers five propositions that can be validated empirically in upcoming studies.

Fourth, considering the new-normal (post-pandemic), the transition to "work from home" is new to several employees, especially in a country such as India, and therefore requires the support of HR professionals. We have added to the body of knowledge concerning blockchain and HR that can benefit HR leaders and professionals in their journey of blockchain adoption. Thereby the HR managers will get time to focus on other tasks that require human interventions.

6.2 Conclusion and future scope

The study seeks to examine the relatively underdeveloped area of blockchain solutions to meet HR needs. Blockchain's potential is being witnessed in the financial and insurance industries while other sectors are validating the proof of concepts. Blockchain can potentially disrupt all organizations, but it must be accepted that blockchain is still at a nascent stage. Several solutions built on the blockchain structure are still in the proof-of-concept phase and need evidence that blockchain performs better than other technologies. Blockchain adoption is accelerating because of the benefits – data security, transparency and speed of the blockchain appear as a potential solution to address HR pain points, but several questions need to be unanswered before inclining toward blockchain. Are organizations ready to embrace blockchain? Are candidates prepared to share their personally identifiable information with potential employers even before they accept an offer?

COVID-19 has provided an unparalleled opportunity for HR leaders to navigate through troubled waters, playing a pivotal role in ensuring the employees' health, safety and well-being while continuing to work with business leaders, clients, suppliers and other stakeholders. While the HR leaders are busy devising strategies to return to the old normal, it is also an opportune moment to accelerate the digitalization of processes, with blockchain seeming to be a promising solution for the entire HR gamut of services.

However, there are also widespread misconceptions about the properties of the blockchains (Upadhyay, 2020), as several of the solutions are still in the proof-of-concept stage. Moreover, blockchain's mainstream discussion still lies with the innovators and early adopters (Frizzo-Barker *et al.*, 2020). Therefore, we expect it would take a few years for organizations to embrace blockchain technology and implement it across the organization. We expect this research to provide a sense of direction for the HR professionals and strategic decision-makers to evaluate blockchain solutions at an organization level, integrating internal processes and external processes. Future research can extend this conceptual model, empirically test the research propositions.

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