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Blockchain Technology and Improving Human Resource Development Processes Field study on Jordanian Banks

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ABSTRACT

The study examined the impact of blockchain technology on four human resource development processes in Jordanian banks. A quantitative approach was used, relying on a questionnaire survey of 158 employees from Jordanian banks, to test four hypotheses related to the relationship between blockchain technology and human resource development processes. The results showed that blockchain technology had a moderately positive relationship with all four human resource development processes, and all four hypotheses were partially accepted. The findings were consistent with previous studies on the role of blockchain technology in human resource management and development. The study revealed that blockchain technology can enhance the security, efficiency, and transparency of human resource development processes, as well as improve the performance, accountability, and innovation of both employees and organizations. However, the study also pointed out that blockchain technology presents certain challenges and barriers to human resource development processes, which require organizations to invest in resources, training, and communication to overcome. The study concludes that blockchain technology is a valuable and innovative tool for human resource development, though its generalizability is limited due to the focus on Jordanian banks.

Key words: Blockchain Technology, Human Resource Development, Digital Technology, Jordanian banks

1. Introduction

Blockchain technology is an innovative game-changer with far-reaching implications for many sectors, including the public sector, healthcare, education, supply chain management, and finance (Swan, 2015). Blockchain technology eliminates the need for middlemen and centralised authority by creating a distributed ledger system that facilitates safe, transparent, and decentralised data sharing and transactions (Ramachandran, et al., 2023). Immutability, traceability, accountability, and efficiency are just a few of the many advantages that blockchain technology offers, which may improve the efficiency and effectiveness of a wide range of activities (Swan, 2015). Human resource development (HRD) is one area that might use blockchain technology. HRD is all about helping people and organisations become better at what they do so they can reach their goals and objectives (Swanson & Holton, 2009). According to Swanson and Holton (2009), human resource development includes a wide range

of tasks and initiatives, including education, training, career development, organisational development, performance management, and talent management. As a result of its effects on human capital, organisational culture, and innovation capability, HRD also impacts the sustainability and competitiveness of organisations (Garavan et al., 2016). Nevertheless, there are a number of obstacles and constraints that HRD must overcome. These include, but are not limited to, the following: the difficulty in accurately assessing the qualifications and credentials of individuals and organizations; the high costs and inefficiency of HRD transactions and data management; and the complexity and diversity of HRD stakeholders and regulations (Garavan et al., 2016). Consequently, it is critical to investigate the potential advantages and disadvantages of using blockchain technology in the HRD field, as well as how blockchain technology might enhance HRD systems and procedures. Studying the effects of blockchain technology on HRD in the banking industry, and more specifically in the Jordanian context, is an intriguing and significant area of research. Human resource development is essential in the fast-paced banking industry so that employees can keep up with the ever-evolving needs of customers, new technologies, and the market (Jena, 2022). According to Jena (2022), blockchain technology has the potential to improve a range of human resource development (HRD) systems and procedures in the banking industry, including hiring, training, certification, assessment, and compensation. So, HRD stakeholders including workers, consumers, regulators, and partners may be more confident and satisfied when blockchain technology is used to enhance HRD processes and systems. While blockchain technology has many potential applications in HRD, the Jordanian banking industry has its own unique traits and problems. As an example, the World Bank (2020) lists unemployment, poverty, corruption, and instability as some of the economic and social challenges faced by Jordan, a developing nation. As a result, things like internet, power, and devices—all essential to blockchain technology—may become more difficult to get or use (World Bank, 2020). Furthermore, Jordan is a religiously conservative nation where Islamic law and principles greatly influence social mores and cultural practices (Jena, 2022). Because of this, those involved in the financial industry may think differently about blockchain technology and whether or not it complies with Islamic law (Jena, 2022). Determining how blockchain technology has altered HRD procedures and systems in Jordan's banking industry is, hence, the primary goal of this study. The Jordanian Banks, a frontrunner among Jordan's financial institutions and a pioneer in blockchain technology use for HRD processes including personnel identification and certification, will serve as the project's case study. According to Creswell and Plano Clark (2017), the study will gather and analyse data quantitatively using methods including surveys and observations.

Blockchain, human resource development, and the technology acceptance model (TAM) are just a few of the key ideas and models that will form the basis of the research's theoretical framework. Here are the anticipated benefits of this study:

- It will provide a comprehensive and in-depth understanding of the impact of blockchain technology on the HRD processes and systems in the banking sector in Jordan.
- It will identify the benefits and challenges of adopting blockchain technology in the HRD domain, and the factors that influence the acceptance and adoption of blockchain technology by the HRD stakeholders.
- It will propose some recommendations and best practices for the successful implementation and integration of blockchain technology in the HRD domain, and the future directions for research and development in this area.

Here is how the remainder of this paper is structured: The theoretical framework and study hypotheses are presented in Section 2, which also evaluates the literature on Blockchain Technology and its implications for enhancing Human Resource Development Processes. Research strategy, data gathering, and analysis are all detailed in Section 3, which also covers the methodology. The data analysis and hypothesis testing findings are reported and discussed in Section 4. In Section 5, we draw a conclusion, discuss the paper's shortcomings, and provide suggestions for further study.Here is how the remainder of this paper is structured: The theoretical framework and study hypotheses are presented in Section 2, which also evaluates the literature on Blockchain Technology and its implications for enhancing Human Resource Development Processes. Research strategy, data gathering, and analysis are all detailed in Section 3, which also covers the methodology. The data analysis and hypothesis testing findings are reported and discussed in Section 4. In Section 5, we draw a conclusion, discuss the paper's shortcomings, and provide suggestions for further study.

Problem Statement

Human resource development (HRD) is essential in the fast-paced banking industry so employees can meet the ever-evolving needs of customers, new technologies, and the market. The efficiency and quality of HRD outputs and results may be impacted by the many HRD processes and systems used in the banking industry, including hiring, training, certification, assessment, and compensation. Employees, consumers, regulators, and partners are all HRD stakeholders; by incorporating blockchain technology into HRD processes and systems, everyone may benefit (Jena, 2022). But nobody really knows what blockchain technology is,

how it can work to enhance HRD systems and procedures, or what the pros and cons of using blockchain technology in HRD are. Furthermore, actual research on the effects of blockchain technology on banks HRD systems and procedures is lacking, particularly in the Jordanian setting. The lack of information in both theory and practice on how blockchain technology may affect HRD procedures and systems in Jordan's banking industry is the primary motivation for this study. The banking sector's competitiveness and sustainability, along with human capital, organisational culture, and innovation potential, are all impacted by this challenge, making it important. As a growing nation, Jordan is dealing with a lot of social and economic problems right now, including unemployment, poverty, corruption, and instability, thus this is an important and urgent subject. The internet, power, and other equipment required by blockchain technology may become less readily available as a result. In addition, the people of Jordan are deeply devout and traditionalist, with Islamic law and values influencing society more than anything else. The way players in the banking industry see blockchain technology and whether or not it aligns with Islamic values and rules may be impacted by this.

2. Literature review

There are various theories and models that explain the impact of blockchain technology on the HRD processes and systems, such as the blockchain value framework, which suggests that blockchain technology can create value for the HRD stakeholders by enabling four types of benefits: reduced cost, reduced risk, increased trust, and increased innovation (Iansiti & Lakhani, 2017); the blockchain adoption model, which suggests that the adoption of blockchain technology in the HRD domain is influenced by four factors: technological, organizational, environmental, and individual (Jena, 2020); the blockchain readiness assessment, which suggests that the readiness of the HRD stakeholders to adopt blockchain technology is determined by four dimensions: awareness, capability, motivation, and opportunity (Mishra et al,, 2021); and the blockchain maturity model, which suggests that the maturity of the blockchain technology in the HRD domain can be assessed by four stages: experimentation, collaboration, integration, and transformation (Mishra et al,, 2021). Another theory called resource-based view, which suggests that the organization’s competitive advantage and performance are influenced by the organization’s valuable, rare, inimitable, and non-substitutable resources and capabilities; the dynamic capabilities view, which suggests that the organization’s ability to adapt and innovate in changing environments are influenced by the organization’s sensing, seizing, and transforming capabilities; the social exchange theory,

which suggests that the organization's relationships and interactions with internal and external stakeholders are influenced by the organization's trust, reciprocity, and commitment; the diffusion of innovations theory, which suggests that the organization's adoption and use of new technologies are influenced by the technology's relative advantage, compatibility, complexity, trialability, and observability; and the institutional theory, which suggests that the organization's conformity and legitimacy in the institutional environment are influenced by the institutional pressures, norms, and values (Barney, 1991; Teece et al., 1997; Blau, 1964; Rogers, 2003; DiMaggio & Powell, 1983).

Human resource development (HRD), an essential part of human resource management (HRM), and blockchain technology is an emerging and underexplored area of study. The following is a list of some of the existing studies:

Research on the use of blockchain technology in HRM is outlined for the future in a study by Ramachandran et al. (2023), which reviews the literature on the topic and identifies gaps in our understanding. Recruitment and selection, development and training, performance management, and pay and benefits are the four primary HRD activities identified as being impacted by blockchain technology in the research. Organisations interested in or planning to implement blockchain technology into their HRD processes can benefit from the study's insights and recommendations, which detail the technology's advantages, disadvantages, and implications.

Research that was carried out by Shaheen, Raghavendra, and Alok (2023) investigates the several facets of human resource management that blockchain technology has the potential to enhance. The processing of payroll, the protection of employee data, and the process of recruitment and selection are all included in these areas. Particular attention is paid to elements such as the verification of certificates and the mapping of skills. The research concludes with a discussion of the challenges that are associated with using blockchain technology in human resource management.

The research conducted by Coita et al. (2019) investigates the possibility that blockchain technology might have an effect on contemporary HR and marketing practices. The paper identifies five potential applications of blockchain technology in the field of human resources. These applications include verifying and evaluating the education and skills of recruits, managing payroll and benefits, enhancing employee engagement and retention, facilitating employee mobility and collaboration, and recording evidence from individuals' education,

skills, training, and workplace performances. The next section of the article discusses how blockchain technology has the potential to revolutionise several marketing practices, such as customer relationship management (CRM), loyalty programmes, digital advertisements, and social media marketing.

Within the scope of their study, Onik et al. (2018) proposed the implementation of a blockchain-based HRM system algorithm as well as a blockchain-based recruitment management system. By means of a case study, they demonstrated that their suggested system performed better than the HRM systems that are already in use.

This digital platform for handling certifications was designed by Jeong and Choi (2019) with the intention of streamlining the process of employing new employees. They decided to use the Blockcerts platform due to its capabilities in blockchain server management and digital certificate administration. Candidates' credentials are authenticated, recorded, and made immutable on the blockchain as they go through the platform. Additionally, candidates are compensated depending on their previous performance, which is taken into consideration.

During the course of their study, Dhanala and Radha (2020) built a recruiting system that was backed by blockchain technology. They emphasised the efficiency of blockchain technology for data verification and security. They provided the following description of the operation of this system: The first step is for the recruiting business to provide the applicant list to the system. The system then does an automated review of the candidate information from various databases, including those belonging to schools and law enforcement organisations, and then saves the data that has been validated on the blockchain. After that, the corporation uses the blockchain to conduct an evaluation of the applicants who have been authorised, and then chooses who to hire. The Rinkeby and Ganache software packages were used in order to conduct tests on this system, which was constructed by using smart contract capabilities on the Ethereum platform.

In their 2020 study, Serranito and colleagues developed an ecosystem for the validation of worldwide certificates by using the blockchain in conjunction with smart contracts on the Ethereum platform. Higher education institutions are able to automatically preserve their education credentials on the blockchain within this ecosystem. Additionally, recruiting organisations are able to verify the authenticity of applicants' certificates by evaluating the information that is registered with them. Through the use of a pilot study, this method was included into the procedures that are used for recruiting in the public sector.

In conclusion, blockchain technology is an innovative and promising technology that has the potential to enhance human resource development (HRD) procedures and systems, as well as boost the confidence and satisfaction of HRD stakeholders. However, blockchain technology also presents a number of hurdles and obstacles that need to be addressed and overcome. These include the complexity of the technology itself, the unpredictability of the legal environment, the opposition from the cultural community, and the ethical implications. Therefore, the primary purpose of this study is to investigate the impact that blockchain technology has on the human resource development (HRD) processes and systems in the banking sector in Jordan. This is a particular and fascinating setting that possesses a number of distinctive characteristics and challenges that may have an impact on the adoption and implementation of blockchain technology in the HRD domain.

3. Methodology

Using Jordanian banks as a case study, the primary purpose of this research is to investigate the influence that Blockchain Technology and Improving Human Resource Development Processes have had on the Jordanian banking sector. An methodology that is quantitative, as well as methods of data gathering and analysis, are used in the study in order to accomplish this objective.

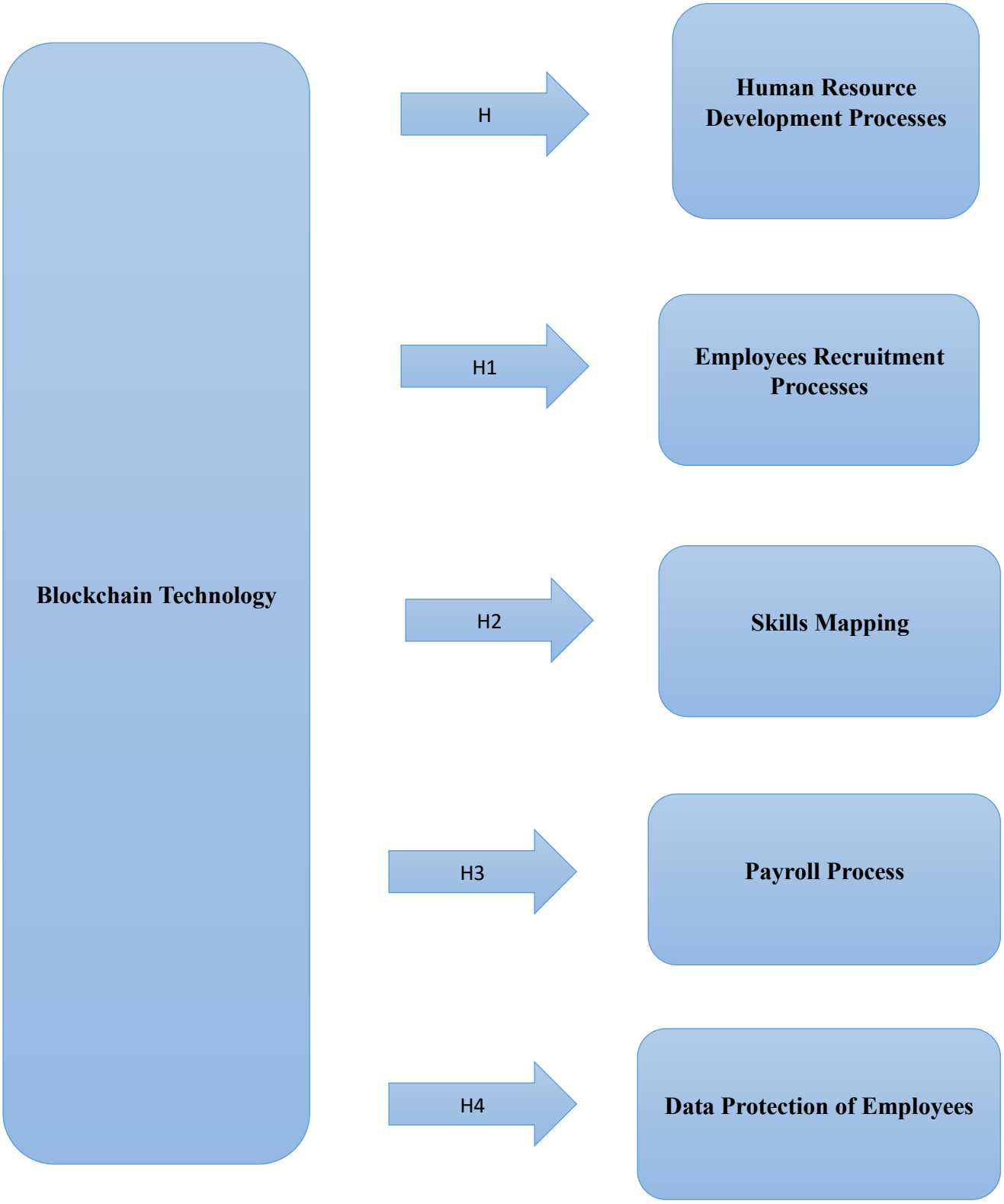
In order to implement the quantitative method, a survey will be administered to the management and staff of Jordanian banks. There are two parts to the survey: the first part is dedicated to gathering demographic and background information on the individuals who are participating in the survey. This includes information such as their age, gender, education level, employment position, and years of experience. Through the use of a Likert scale with five points, the second component of the survey takes into account the respondents' perspectives on Blockchain Technology and its influence on the enhancement of human resource development processes. For the purpose of determining the level of agreement among the responders, a Likert scale with five points was used (for example, 1 indicates significant disagreement and 5 indicates strong agreement). Modifications were made to the items of each variable in order to accommodate the present investigation.

The survey items are adapted from previous studies that dealt with the same topic (Ramachandran, R., Babu, V. and Murugesan, V.P., 2023), (Shaheen, M., Raghavendra, S. and Alok, S., 2023), (Coita, Dorin & Abrudan, Maria & Matei, Mirabela., 2019), (Onik, M.M.H.;

Miraz, M.H.; Kim, C.-S., 2018), (Dhanala, N.S.; Radha, D., 2020), (Mishra, Himani & Venkatesan, M.., 2021). Online distribution of the survey is accomplished via the use of email and other social media platforms. The data obtained from the survey is then analysed with the use of SPSS software. In the examination of the data, descriptive statistics, reliability and validity testing, correlation analysis, and multiple regression analysis are all included.

The Blockchain Technology serves as the independent variable in this study, while the Human Resource Development Processes serve as the dependent variable. The following represents the primary research variables that are being investigated in this study: Procedures for the Recruitment of Employees, the Mapping of Skills, the Accounting Procedure, and the Protection of Employee Data (Chillakuri and Attili, 2021).

Following figure no.1 represent the research model



The blockchain technology implementation is the independent variable in this study, while the human resource development processes are the dependent variable. This is shown in the figure that is located above. The Human Resource Development Processes may be broken down into four categories: The processes of employee recruitment, skills mapping, the payroll process, and the safeguarding of employee data are discussed in Chillakuri and Attili's 2021, respectively. At the same time, the picture illustrates the primary hypothesis (H) of the investigation, which is that:

- Blockchain Technology has a positive impact on Human Resource Development Processes represented by its all dimensions in Jordanian Banks

Some previous studies that support this figure are such as: (Ramachandran, R., Babu, V. and Murugesan, V.P., 2023), (Shaheen, M., Raghavendra, S. and Alok, S., 2023), (Coita, Dorin & Abrudan, Maria & Matei, Mirabela., 2019), (Onik, M.M.H.; Miraz, M.H.; Kim, C.-S., 2018), (Dhanala, N.S.; Radha, D., 2020), (Mishra, Himani & Venkatesan, M.., 2021).

This hypothesis can be tested by dividing it into the following sub-hypotheses:

H1: Blockchain Technology has a positive impact on Employees Recruitment Processes in Jordanian Banks

H2: Blockchain Technology has a positive impact on Skills Mapping in Jordanian Banks

H3: Blockchain Technology has a positive impact on Payroll Process in Jordanian Banks

H4: Blockchain Technology has a positive impact on Data Protection of Employees in Jordanian Banks

4. Results and findings

4.1. Scale Validity and Reliability:

In order to verify the Stability of the study tool (questionnaire) the internal consistency test was conducted, and the following table No. (1) shows the test result, which indicates that the value of the Cronbach's Alpha exceeded 60% for all paragraphs of the questionnaire.
This indicates that the degree of stability of the study tool is high and therefore it can be relied upon.

Table no.1: Reliability Statistics

Variable	Cronbach's Alpha	N of Items
Employees Recruitment Processes	0.784	6
Skills Mapping	0.856	6
Payroll Process	0.772	6
Data Protection of Employees of	0.859	6
Blockchain Technology	0.787	30
Total	0.901	45

4.2. Respondent's Demographic statistics

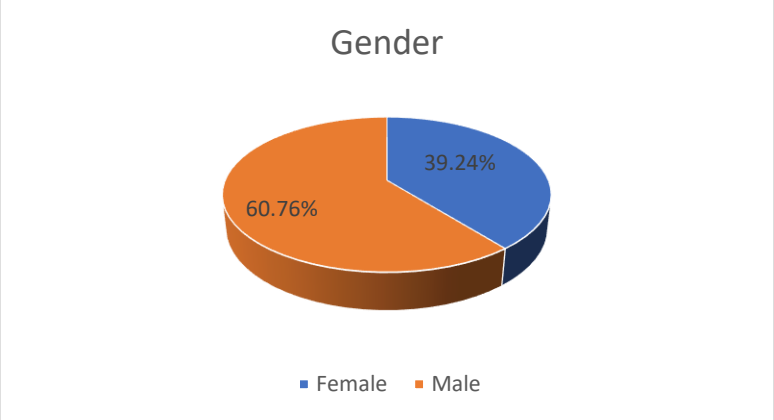
The demographics questions included gender, age, education, and experience.

Gender

The results of the study members responses about the gender as showing in the below table indicate that “Male” represents of 60.76%. While “Females” represents only 39.24%.

Table no.2: Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Female	62	39.24	39.24	39.24
Male	96	60.76	60.76	100.0
Total	158	100.0	100.0	

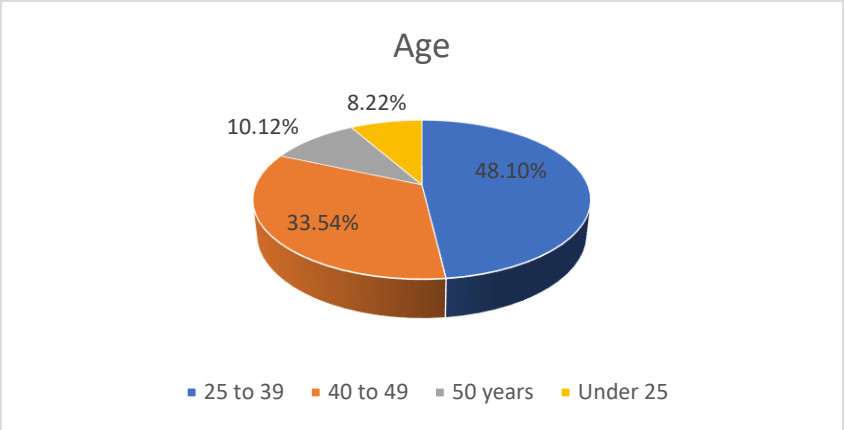


Age

The results of the study members responses about the age as showing in the below indicate that responders age between 25-39 years came in the first place by 48.10% of total number of responders, whereas the age under 25 years came in the last place by only 8.22% of total number of responders, where age category of 40 - 49 represent 33.54% comes in the second place.

Table no.3: **Age**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25 to 39	76	48.10	48.10	48.10
	40 to 49	53	33.54	33.54	81.64
	50 years	16	10.12	10.12	91.76
	Under 25	13	8.22	8.22	100.0
	Total	158	100.0	100.0	

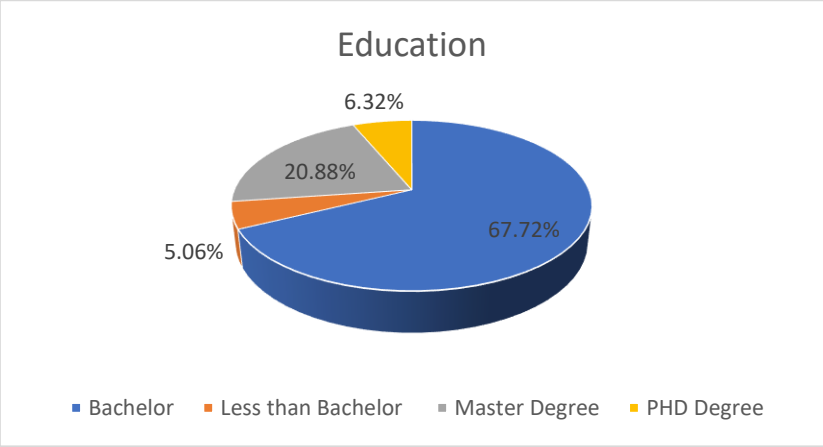


Education

The results of the study members responses about the education level as showing in the below table indicate that the Bachelor holders came in the first place by 67.72% of the total number of the study sample, and Master degree holders came in the second place by 67.72% of the total number of the study sample.

Table no.4: **Education**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	107	67.72	67.72	65.6
	Less than Bachelor	8	5.06	5.06	72.78
	Master Degree	33	20.88	20.88	93.66
	PHD Degree	10	6.32	6.32	100.0
	Total	158	100.0	100.0	

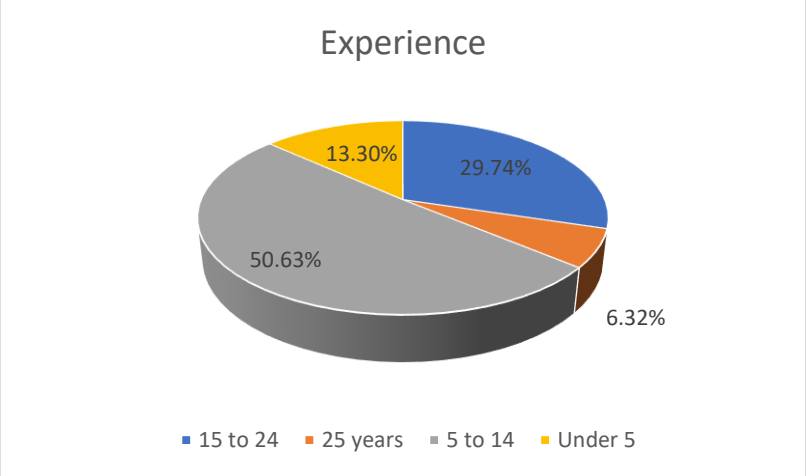


Experience

As shown in the table below, the results of the responses of the study participants regarding the years of experience indicate that the category of having between five and fourteen years of experience came in first place, received by fifty-six point three percent of the total sample of the study, followed by the category of having between fifteen and twenty-four years of experience, which received twenty-nine point seven percent of the total sample of the study, and finally, the category of having twenty-five years of experience or more came in last place, receiving only six point two percent of the total sample of the study.

Table no. 5: **Experience**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15 to 24	47	29.74	29.74	29.74
	25 years	10	6.32	6.32	36.06
	5 to 14	80	50.63	50.63	86.69
	Under 5	21	13.30	13.30	100.0
	Total	158	100.0	100.0	



4.3.Hypothesis Testing

Sub-hypothesizes Testing

H1: Blockchain Technology has a positive impact on Employees Recruitment Processes in Jordanian Banks

Table no.6: **Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.410	0.161	0.154	0.571

The independent variable is Blockchain Technology

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Table no.7: **ANOVA**

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	13.177	1	15.156	31.221	0.000
Residual	71.026	156	0.345		
Total	84.203	157			

The independent variable is Blockchain Technology

Table no.7: **Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Blockchain Technology	0.446	0.059	0.410	7.482	0.000
(Constant)	2.701	0.261		10.342	0.000

As can be seen in the tables that have been shown above, the correlation value between Blockchain Technology and Employee Recruitment Processes is 0.421, which suggests that the association is of a somewhat good nature. According to the results of the regression analysis, the adjusted R square is 0.154, which indicates that the Blockchain Technology is responsible for analysing about 15.4% of the Employee Recruitment Processes in Jordanian Banks. However, the F value for the test reached 31.221, which is a very high figure that indicates that the test is significant and can be depended on. This is seen in the table that contains the results of the Anova test. For the F test, the significant value reached 0.000, which is less than the threshold of 5%, indicating that this test is significant at the 5% level. On account of this, the first sub-hypothesis is accepted to a certain extent.

H2: Blockchain Technology has a positive impact on Skills Mapping in Jordanian Banks

Table no.8: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.454	0.201	70.19	90.56

The independent variable Blockchain Technology.

Table 9: **ANOVA**

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	17.667	1	18.634	44.732	0.000
Residual	68.543	156	0.345		
Total	86.21	157			

The independent variable is Blockchain Technology.

Table 10: **Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Information Blockchain Technology	0.652	0.097	0.454	9.213	0.000
(Constant)	1.765	0.667		4.340	0.000

According to the data shown above, there is a somewhat positive association (r=0.454) between blockchain technology and skill mapping. With an adjusted R squared value of 0.201, as shown in the regression test, Blockchain Technology explains almost 20.1% of the variance in skills mapping among Jordanian banks. Additionally, the Anova test table reveals that the test's F value reached 44.732, a very high number that indicates the test's significance and reliability. Given that the F-test's significant value was 0.000 < 5%, it can be concluded that this test is significant at the 5% level. As a result, we can only partly reject the initial null hypothesis.

H3: Blockchain Technology has a positive impact on Payroll Process in Jordanian Banks

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.553	0.287	0.283	0.547

The independent variable is Blockchain Technology.

ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	24.783	1	24.435	84.838	0.000
Residual	61.234	156	0.254		
Total	86.017	157			

The independent variable is Blockchain Technology.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Blockchain Technology	0.553	0.066	0.533	8.765	0.000
(Constant)	2.164	0.238		8.786	0.000

According to the data shown above, there is a somewhat favourable association (r=0.454) between blockchain technology and the payroll process. The results of the regression test reveal an adjusted R squared value of 0.283, indicating that about 28.3% of the payroll processes in

Jordanian banks are influenced by blockchain technology. A extremely high F value of 84.838, as shown in the Anova test table, indicates that the test is significant and reliable. Given that the F-test's significant value was 0.000 < 5%, it can be concluded that this test is significant at the 5% level. As a result, we can only partly reject the initial null hypothesis.

H4: Blockchain Technology has a positive impact on Data Protection of Employees in Jordanian Banks

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.559	0.296	0.294	0.551

The independent variable Blockchain Technology.

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	24.234	1	25.688	92.022	0.000
Residual	64.384	156	0.285		
Total	88.618	157			

The independent variable Blockchain Technology.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Blockchain Technology	0.512	0.065	0.559	11.443	0.000
(Constant)	2.382	0.213		10.899	0.000

According to the data in the tables above, there is a somewhat favourable association (r=0.559) between blockchain technology and employee data protection. The results of the regression test reveal an adjusted R squared value of 0.294, indicating that about 29.4% of the data protection for employees in Jordanian banks is influenced by blockchain technology. In addition, the Anova test table reveals that the test's F value reached 92.022, a very high number that indicates the test's significance and reliability. Given that the F-test's significant value was 0.000 < 5%, it can be concluded that this test is significant at the 5% level. As a result, we can only partly reject the initial null hypothesis.

Main Hypothesis Testing

H: Blockchain Technology has a positive impact on Human Resource Development Processes represented by its all dimensions in Jordanian Banks

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.710	0.552	0.536	0.4669

a. Predictor: Blockchain Technology

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.314	1	6.654	38.887	0.000[b]
	Residual	39.883	156	.195		
	Total	86.197	157			

a. Dependent Variable: Human Resource Development
b. Predictors: (Constant), Blockchain Technology.

Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Blockchain Technology	0.588	0.056198	0.710	18.765	0.000
(Constant)	2.459	0.213		12.342	0.000

According to the data in the tables above, there is a very substantial positive connection between blockchain technology and human relations development across all dimensions (r=0.710). The regression test reveals an adjusted R squared value of 0.536, indicating that about 53.6% of the human relations development process in Jordanian banks is influenced by blockchain technology. In addition, the Anova test table reveals that the test's F value reached 38.887, a very high result that indicates the test's significance and reliability. Given that the F-test's significant value was 0.000 < 5%, it can be concluded that this test is significant at the 5% level. Hence, the research's primary hypothesis is validated.

5. Discussion results and conclusion

One of the most prominent Jordanian banks that has embraced blockchain technology for its services and operations was the subject of this research, which set out to analyse the effects of the technology on HRD procedures at the Jordanian Banks. The study employed a quantitative approach, drawing from a survey of 158 bank employees in Jordan, to examine four theories concerning the connection between blockchain technology and four HRD processes: employee data protection, skills mapping, payroll, and recruitment.

The study's findings demonstrated the questionnaire's excellent reliability; across all parts, Cronbach's alpha values were more than 60%. The majority of respondents were men (25–39 years old), and their education level was bachelor's. Their work experience ranged from 5–14 years.

According to the regression and correlation studies, blockchain technology accounted for a considerable amount of the variation in each of the four HRD processes and had a somewhat favourable link with all of them. Due to the considerable (at the 5% level) correlation between blockchain technology and each process, the data also showed that all four hypotheses were partly accepted.

Consistent with other research on blockchain's function in HRM and development, this study found that it can improve HR operations. For instance, in their review of the literature on blockchain technology and enterprise HRM, Ramachandran et al. (2023) found that the technology has an impact on four primary HRD processes: hiring and selection, development and training, performance management, and pay and benefits. They went on to discuss the ways in which blockchain technology may improve HRD while also outlining its potential pitfalls and consequences. The use of blockchain technology in many areas of human resource management was also investigated by Shaheen et al. (2023). These areas included payroll processing, employee data security, and the recruiting and selection process, specifically focusing on certificate verification and skill mapping. Additionally, they covered the difficulties associated with using blockchain technology for HRM.

As an empirical case study of a real-world organisation that has used blockchain technology for its HRD operations, this research adds to the existing body of literature on blockchain technology and HRD. This study's findings suggest that blockchain technology has the potential to revolutionise HRD procedures by making them more secure, efficient, and transparent. It can also boost individual and organisational performance, accountability, and creativity. Blockchain technology presents certain difficulties for HRD processes, according to

this study. These include issues with change management, technical skills, compliance with regulations, and involvement of stakeholders. To overcome these difficulties, organisations will need to allocate resources, provide training, and maintain open lines of communication.

Both the scholarly community and practitioners should be aware of the study's limitations and the consequences of its findings. Based on the findings of this study, blockchain technology has the potential to revolutionise human resource development by making processes more secure, efficient, and transparent. This, in turn, can boost employee and organisational performance, accountability, and innovation. The study's confinement to Jordanian Banks—a particular kind of organisation in a specific sector and country—limits the generalizability of the results to other settings and organisations. Data included in the research came from workers' self-reports, which might have been skewed or inaccurate. Additionally, causal inference and longitudinal analysis are not possible due to the study's cross-sectional methodology.

Some suggestions for further study and practice are offered by the findings of this investigation. Additional empirical studies utilising various methods and measurements, such as experiments, interviews, observations, or secondary data, should be undertaken to determine the effect of blockchain technology on HRD processes in various types of organisations, industries, and nations in the future. Furthermore, additional theoretical and conceptual research utilising various frameworks and viewpoints, such as the resource-based view, the dynamic capabilities view, the social exchange theory, the diffusion of innovations theory, or the institutional theory, should be undertaken to examine the connection between blockchain technology and HRD processes. In order to put blockchain theory into practice, businesses that are thinking about or already using it for HR purposes should think about how it fits in with their overall goals and values, whether or not everyone involved is on board with using it, whether or not they have the resources to manage the technology, whether or not it complies with industry and national regulations, and finally, how will they measure the results and effects of blockchain on HR?

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7. Appendix

Survey

NO	QUESTION	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Employees Recruitment Processes						
ERP1	How do you rate the overall recruitment process at our organization? (1 - Very poor, 5 - Very good)					
ERP2	How well did the job description and the requirements match the position you applied for? (1 - Not well at all, 5 - Very well)					
ERP3	How prompt and informative was the communication from the recruiter or the hiring manager during the recruitment process? (1 - Not prompt or informative at all, 5 - Very prompt and informative)					
ISA4	How effectively did the interview process evaluate your skills, knowledge, and fit for the role and the organization? (1 - Not effectively at all, 5 - Very effectively)					
ISA5	How likely are you to refer our organization as an employer to others? (1 - Not likely at all, 5 - Very likely)					
Skills Mapping						
SM1	How do you rate your level of proficiency in each of the skills or competencies you listed? (1 - Beginner, 5 - Expert)					
SM2	How frequently do you use each of the skills or competencies you listed in your daily work? (1 - Never, 5 - Always)					

SM3	What are the skills and competencies that you would like to learn or improve for your current or future role? (Please list up to five skills or competencies)					
SM4	You prefer to acquire new skills or competencies by applying (Online courses, Webinars, Workshops, Coaching, Mentoring, Self-study, On-the-job training, Other)					
SM5	You receive feedback and recognition for your skills and competencies from your manager, colleagues, or clients (Please rate from 1 - Not at all, to 5 - Very often)					
Payroll Process						
PP1	How do you rate the payroll process at our organization? (1 - Very poor, 5 - Very good)					
PP2	How easy is it for you to access and update your payroll information online? (1 - Not easy at all, 5 - Very easy)					
PP3	How accurate and timely is your payroll payment and statement? (1 - Not accurate or timely at all, 5 - Very accurate and timely)					
PP4	How well do you understand the deductions, benefits, and taxes on your payroll statement? (1 - Not well at all, 5 - Very well)					
PP5	How helpful and responsive is the payroll team when you have questions or issues regarding your payroll? (1 - Not helpful or responsive at all, 5 - Very helpful and responsive)					
Data Protection of Employees						
DPE1	How aware are you of the data protection policies and practices at our					

	organization? (1 - Not aware at all, 5 - Very aware)					
DPE2	How confident are you that your personal data is secure and protected at our organization? (1 - Not confident at all, 5 - Very confident)					
DPE3	How often do you receive training or guidance on data protection and privacy issues? (1 - Never, 5 - Always)					
DPE4	How comfortable are you with sharing your personal data with the organization for legitimate purposes? (1 - Not comfortable at all, 5 - Very comfortable)					
DPE5	You prefer to be informed and consulted about the use of your personal data by the organization such as: (Email, Newsletter, Intranet, Meeting, Consent form, Other)					
Blockchain Technology						
BT1	How familiar are you with blockchain technology and its applications? (1 - Not familiar at all, 5 - Very familiar)					
BT2	How interested are you in learning more about blockchain technology and its applications? (1 - Not interested at all, 5 - Very interested)					
BT3	How do you perceive the benefits and challenges of blockchain technology for your role and the organization? (1 - No benefits or challenges, 5 - Many benefits and challenges)					
BT4	How willing are you to adopt and use blockchain technology for your work processes and tasks? (1 - Not					

	willing at all, 5 - Very willing)					
BT5	You prefer to receive information and training on blockchain technology and its applications such as: (Online courses, Webinars, Workshops, Podcasts, Blogs, Articles, Other)					

END