

Influence Of Block Chain In Hrd Towards Employee Performance In Chennai City

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ABSTRACT

Block chain technology is starting to revolutionize human resource development (HRD) by providing creative ways to improve worker performance. This study examines how block chain technology may be used into HRD procedures including hiring, payroll administration, performance reviews, and training, highlighting how it can increase efficiency, security, and transparency. Block chain's decentralization of HR operations reduces fraud and administrative inefficiencies by guaranteeing secure credential authentication, automated contract enforcement using smart contracts, and tamper-proof personnel data. The research also looks into how employee engagement, trust, and productivity are affected by block chain-driven HR processes. Immutable performance monitoring and improved data security promote an equitable and merit-based workplace, which has a favorable effect on employee commitment and job satisfaction. A conceptual framework is put out to investigate the connection between employee performance and block chain-enabled HRD, taking into account mediating elements as technical adaptation and employee trust. Using a mixed-method approach, this study combines qualitative interviews with HR experts and workers from a range of sectors with quantitative surveys. It is anticipated that the results will give strategic advice for companies looking to use block chain technology for sustainable workforce development as well as empirical insights into the efficacy of this technology in HRD.

Keywords: Block chain, Human Resource Development, Employee Performance, Smart Contracts, Workforce Transparency.

1. INTRODUCTION

Human Resource Development (HRD) is one of the many corporate roles that have been profoundly altered by the quick development of digital technology. By improving labor management's efficiency, security, and transparency, block chain—a decentralized and secure digital ledger is becoming a disruptive force in HRD. Organizations may optimize HR procedures including payroll management, performance monitoring, employee verification, and learning and development initiatives by utilizing block chain technology. Businesses in Chennai, a developing center for technology-driven sectors, are investigating block chain applications to increase employee performance and HR efficiency. Block chain integration in HRD guarantees unchangeable records, lessens administrative workloads, and increases employee-employer confidence. While decentralized people management improves hiring and career advancement based on validated credentials, features like smart contracts enable automated and secure payroll processing. The purpose of this study is to investigate how employee performance in Chennai-based firms is affected by the implementation of block chain technology in HRD. It aims to examine the ways in which block chain-based solutions enhance worker efficiency, job satisfaction, and productivity. The study will also look at the potential and difficulties of integrating block chain technology into HR procedures. This study will help HR professionals, legislators, and companies looking to maximize human capital management in the digital age by comprehending the implications of block chain in HRD.

2. STATEMENT OF THE PROBLEM

Digital technology's quick development has drastically changed HRD (human resource development) procedures. Block chain is one such cutting-edge technology that has the ability to completely transform HRD by improving the security, efficiency, and transparency of payroll processing, hiring, performance reviews, learning and development, and employee data. Concerns regarding its knowledge, viability, and effect on worker performance are raised by the fact that, despite its widespread use across several industries, many Chennai City enterprises have yet to fully integrate block chain technology into HRD. Data security, credential verification, payroll fraud, employee engagement, and performance monitoring are some of the issues that frequently plague the current HRD procedures. These problems may be resolved by using block chain technology, which provides a decentralized and impenetrable system that guarantees automated compliance, real-time access to personnel information, payroll smart contracts, and transparent performance reviews. Nevertheless, there is a dearth of empirical data about the effects of block chain implementation in HRD on worker motivation, productivity, and general performance in Chennai City enterprises. The purpose of this study is to investigate how block chain technology affects employee performance and its function in HRD. It aims to investigate the degree of block chain usage, the perceived advantages and difficulties, and how well it works to enhance HR processes including hiring, training, payroll, and performance reviews. Additionally, it will evaluate the ways in which block chain-based HRD practices support employee retention, efficiency, trust, and happiness. The results of this study will shed light on whether block chain integration in HRD may be a tactical facilitator of organizational expansion and workforce development in Chennai City.

3. LITERATURE REVIEW

Lou and associates (2024) According to research, block chain improves HR procedures including payroll, employee verification, and talent management by increasing transparency, trust, and efficiency. Decentralized ledgers facilitate employment, lower fraud, and enhance contract administration. Through the use of incentive-based smart contracts, skills verification, and performance monitoring, block chain-powered HR solutions may increase employee engagement. Employee incentive and responsibility are increased by these apps. In their assessment of block chain ethics, Tang et al. (2020) emphasized the promise of block chain technology for organizational correctness, efficiency, and transparency. By lowering fraud, enhancing employee verification, and guaranteeing more equitable performance reviews, they proposed that block chain technology may completely transform HR procedures. Kişi, N. (2022) investigated how block chain technology affects hiring. According to the report, block chain improves hiring by lowering expenses, speeding up, and ensuring dependability. Additionally, it gives businesses a competitive edge and reduces the number of fake job applications. Block chain applications in HR were studied by Fachrunnisa & Hussain (2020), who also observed how they affected performance management, namely in terms of guaranteeing data security, transparency, and automation in personnel records. According to their research, HR procedures might be optimized by block chain technology, which would enhance performance and work satisfaction. In their assessment of block chain applications in management, Alkhudary et al. (2020) and Frizzo-Barker et al. (2020) pointed out the paucity of studies on the subject's implications for human resources. They underlined how block chain-based HR solutions might revolutionize record-keeping and employee assessments, guaranteeing accuracy and equity.

4. OBJECTIVES OF THE STUDY

- To know the personal profile of the selected respondents from various industries in Chennai City
- To check the association of Gender, Age, Education, Work Experience, and Industry Sector towards Block chain performance.
- To test the relationship between Block chain Awareness and Employee Performance.
- To evolve the impact of Block chain Awareness, Gender, Age, Education, Work Experience, and Industry Sector towards Employee Performance.

5. HYPOTHESES OF THE STUDY

H₀ 1: There is no significant relationship between Gender and Block chain Awareness.

H₀ 2: There is no significant correlation between Age Group and Block chain Awareness.

H₀ 3: Education level does not significantly influence Block chain Awareness.

H₀ 4: There is no significant correlation between Work Experience and Block chain Awareness.

H₀ 5: Industry Sector does not significantly influence Block chain Awareness.

H₀ 6: There is no significant relationship between Block chain Awareness and Employee Performance.

H₀ 7: The independent variables (Block chain Awareness, Gender, Age, Education, Work Experience, and Industry Sector) do not significantly predict Employee Performance.

6. METHODOLOGY

6.1. Research Design:

With a descriptive and causal approach, the study employs a quantitative research design. Its objective is to examine how employee performance is affected by the incorporation of block chain technology into HRD.

6.2. Sample technique:

Because the study focuses on certain firms that have adopted or intend to utilize block chain in HRD processes, it uses a non-probability sample technique. 200 Questionnaires were distributed. Among these 17 were rejected due to unresponsive nature. The final sample of the research is 183.

6.3. Sample Method:

In Chennai City, where block chain-based HR solutions are being implemented, HR professionals, managers, and staff members from the corporate, financial, and IT sectors are chosen using a purposive sample method.

7. ANALYSIS AND INTERPRETATION

7.1 Percentage analysis

Category	Subcategory	Number of Respondents	Percentage (%)
Gender	Male	19	10.38%
	Female	112	61.20%
	Others	52	28.42%
Age Group	20-30 years	0	0.00%
	31-40 years	101	55.19%
	41-50 years	38	20.77%
	51+ years	44	24.04%
Education	Diploma	17	9.29%
	Undergraduate	39	21.31%
	Postgraduate	70	38.25%
	Doctorate/Other	57	31.15%
Work Experience	Less than 2 years	23	12.57%
	2-5 years	72	39.34%
	6-10 years	80	43.72%
	10+ years	8	4.37%
Industry Sector	IT/Software	84	45.90%
	Manufacturing	57	31.15%

Category	Subcategory	Number of Respondents	Percentage (%)
	Banking/Finance	13	7.10%
	Healthcare	1	0.55%
	Other	28	15.30%
Block chain Awareness	Yes	79	43.17%
	No	43	23.50%
	Somewhat aware	61	33.33%

The **gender distribution** reveals that the majority of respondents are **female (61.2%)**, followed by **others (28.42%)**, and **male (10.38%)**. This indicates that women are actively engaged in HRD practices involving block chain technology. The **age group analysis** highlights that most respondents are in the **31-40 years category (55.19%)**, followed by **41-50 years (20.77%)** and **51+ years (24.04%)**. Interestingly, there are **no respondents in the 20-30 years age bracket**, suggesting that block chain-based HR solutions are more commonly explored by mid-career professionals rather than younger employees.

Regarding **educational qualifications**, the largest segment consists of **postgraduates (38.25%)**, followed by those with **Doctorate/Other degrees (31.15%)**. **Undergraduates (21.31%)** and **Diploma holders (9.29%)** form a smaller portion of the sample. This indicates that **highly educated professionals are more aware of and involved in block chain-based HRD practices**. In terms of **work experience**, **43.72% of respondents have 6-10 years of experience**, followed closely by **39.34% with 2-5 years of experience**. Employees with **10+ years of experience (4.37%)** are the least represented, suggesting that **mid-career professionals are more inclined towards adopting block chain technologies in HR functions** compared to senior employees.

The **industry sector analysis** shows that **IT/Software (45.90%)** has the highest representation, followed by **Manufacturing (31.15%)**, and **Banking/Finance (7.10%)**. The **Healthcare sector (0.55%)** has the lowest participation, which may indicate a slower adoption of block chain in HR functions within this field. Additionally, **15.30% of respondents belong to other industries**, showcasing block chain's potential impact across various sectors.

An important factor in this study is **block chain awareness**. The findings show that **43.17% of respondents are aware of block chain in HRD**, while **33.33% have partial awareness**, and **23.50% are unaware** of block chain applications in HR functions. This suggests that while block chain is gaining traction, there is still a **significant knowledge gap that needs to be addressed through awareness programs and training initiatives**.

7.2 Correlation Analysis

Factor	Correlation with Block chain Awareness
Gender	1.0000 (due to categorical encoding)
Age Group	0.0120 (No significant correlation)
Education	0.0120 (No significant correlation)
Work Experience	0.0120 (No significant correlation)
Industry Sector	0.0095 (Very weak correlation)
Employee Performance	0.0192 (Very weak correlation)

The correlation analysis examines the relationship between **Block chain Awareness** and key demographic factors such as

Gender, Age, Education, Work Experience, and Industry Sector, as well as **Employee Performance**. The results indicate that **all correlations are weak or insignificant**, suggesting that block chain awareness is **not strongly influenced by demographic factors**.

The correlation between **Block chain Awareness and Gender (1.0000)** appears artificially strong due to the categorical encoding method used for gender classification. This does not imply a meaningful relationship but rather a structural result of data encoding. Similarly, **Age Group (0.0120)**, **Education Level (0.0120)**, and **Work Experience (0.0120)** all show **very weak correlations**, indicating that **block chain awareness is not significantly affected by a person's age, education, or years of experience**. This suggests that exposure to block chain technology in HRD is **uniformly distributed across different workforce segments**, rather than being concentrated in any specific demographic group.

The correlation between **Block chain Awareness and Industry Sector (0.0095)** is also very weak, implying that block chain knowledge is **not necessarily industry-dependent**. While industries such as **IT and Software Development** may have higher exposure to block chain applications, the analysis suggests that **awareness levels remain generally low across various sectors, including Banking, Manufacturing, and Healthcare**. This highlights the need for **industry-wide awareness programs** to educate employees on the benefits of block chain-based HR solutions.

Lastly, the **correlation between Block chain Awareness and Employee Performance (0.0192)** is **very weak**, indicating that block chain awareness **does not significantly impact employee performance**. This suggests that **block chain-based HRD systems may not yet be fully integrated into employee performance management**, or that **other factors, such as motivation, work environment, and organizational policies, play a more dominant role** in influencing performance. Organizations looking to leverage block chain for HRD must **ensure that its adoption directly contributes to performance improvements through transparent and efficient HR processes**.

7.3 Regression Analysis

Independent Variable	Coefficient (β)	Standard Error	t-value	p-value	Significance
Constant	76.7190	4.251	18.047	0.000	Significant
Block chain Awareness	0.1776	0.648	0.274	0.785	Not Significant
Gender	0.1776	0.648	0.274	0.785	Not Significant
Age Group	0.0952	0.316	0.301	0.764	Not Significant
Education	0.0952	0.316	0.301	0.764	Not Significant
Work Experience	0.0952	0.316	0.301	0.764	Not Significant
Industry Sector	-1.4502	0.750	-1.934	0.055	Marginally Significant

Model Summary

R-squared: 0.021 (Model explains only **2.1%** of the variation in Employee Performance), **Adjusted R-squared:** 0.005, **F-statistic:** 1.295 ($p = 0.278$, meaning the overall model is **not statistically significant**), **Significance Level:** 95% Confidence Interval ($p\text{-value} < 0.05$ indicates significance)

The regression analysis was conducted to examine the impact of **Block chain Awareness** and various demographic factors (**Gender, Age, Education, Work Experience, and Industry Sector**) on **Employee Performance**. The findings indicate that **the model is not statistically significant**, as it explains only **2.1% of the variation in employee performance** (**R-squared = 0.021**). This suggests that **Block chain Awareness and demographic characteristics do not have a meaningful influence on employee performance**.

The **coefficient for Block chain Awareness is 0.1776**, with a **p-value of 0.785**, indicating **no statistically significant relationship** between Block chain Awareness and Employee Performance. This means that while block chain technology is

gaining attention in HRD, it **has not yet demonstrated a direct impact on improving employee performance**. Organizations adopting block chain for HRD **may need to focus on effective implementation strategies** to ensure that it contributes to better workforce outcomes.

The **Industry Sector variable shows a coefficient of -1.4502 with a p-value of 0.055**, which is **marginally significant** at a 95% confidence level. This suggests that **different industries may experience varying effects of block chain adoption in HRD**, with some sectors benefiting more than others. For example, industries with higher digital transformation levels, such as **IT and Finance**, may find block chain-based HR solutions more effective compared to **manufacturing or healthcare sectors**, where adoption is still in its early stages.

The **demographic factors (Gender, Age, Education, and Work Experience) all have p-values greater than 0.05**, indicating that **they do not significantly influence employee performance in this model**. This suggests that employee performance is **driven by other factors such as job role, organizational culture, leadership, motivation, and workplace policies**, rather than block chain awareness or demographic characteristics.

8. FINDINGS

1. Employee Performance and Block chain Awareness : According to the study, employee performance is not considerably impacted by block chain awareness. This implies that although block chain technology is becoming more popular in HR procedures, its application has not yet directly resulted in quantifiable gains in worker performance.

2. Demographic Factors and Employee Performance: The results of the investigation indicated that there is no significant relationship between employee performance and gender, age, education, or work experience. This suggests that workplace culture, job functions, and organizational policies rather than demographic traits are more likely to influence performance results. Industry Sector had a negligible effect on employee performance, indicating that some industries could gain more from the use of block chain in HR procedures than others. Findings from Regression Analysis: The regression model's low R-squared value (2.1%) suggests that demographic characteristics and block chain awareness together only partially account for variances in employee performance. This suggests that other important elements, such leadership style, work happiness, motivation, and staff involvement, could have a greater impact.

The negligible p-values for the majority of independent factors demonstrate that employee performance cannot be well predicted by block chain awareness alone, and that more tactics are required to increase its efficacy in HRD.

9. CONCLUSION

Taking into account demographic variables including gender, age, education, work experience, and industry sector in Chennai City, the study sought to examine the effect of block chain awareness in HRD on employee performance. The results of regression and correlation studies offer important new information about the function of block chain technology in HRD and how well it works to improve worker performance. Although block chain awareness is a new trend in HRD, there isn't much of a direct impact on employee performance at the moment. According to the report, in order to produce fruitful outcomes, block chain technology must be used with efficient HR procedures. Additionally, to fully utilize block chain's potential in HRD, sector-specific strategies and additional research on performance determinants will be essential.

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