Artificial Intelligence and Machine Learning to Enhance E-Money Utilisation and Human Resource Development in Ica Agro-Export Firms

[1]Dr. Jesus Enrique Reyes Acevedo, [2]Dra. Esther Jesus Vilca Perales, [3]Dra. Ericka Janet Villamares Hernández, [4]Mg. Uldarico Canchari Vásquez

Abstract: The integration of Artificial Intelligence (AI) and Machine Learning (ML) technologies has revolutionized various industries, and their potential impact on e-money utilization and human resource development is substantial. This paper explores the synergies between AI/ML and e-money systems, elucidating their role in optimizing financial transactions and bolstering human resource capabilities. In the realm of e-money, AI algorithms can analyze vast datasets to discern patterns, detect anomalies, and predict consumer behavior. By leveraging these insights, e-money platforms can offer personalized financial services, streamline transactions, and mitigate fraud risks. Furthermore, AI-powered chatbots and virtual assistants enhance user experience by providing real-time support and personalized recommendations, fostering greater trust and engagement within e-money ecosystems.Moreover, AI and ML technologies hold immense promise for human resource development. Through data-driven insights, organizations can optimize talent acquisition, identify skill gaps, and tailor training programs to individual needs. AI-driven recruitment platforms streamline the hiring process by automating candidate screening and matching, thereby expediting the identification of top talent. Additionally, ML algorithms facilitate continuous learning initiatives by analyzing employee performance data to deliver personalized learning experiences and targeted skill development pathways..

1. Introduction

In today's digital era, the integration of Artificial Intelligence (AI) has revolutionized various facets of our lives, including financial transactions and human resource management. The emergence of e-money systems, coupled with AI technologies, presents unprecedented opportunities to enhance efficiency, security, and accessibility in financial transactions while concurrently optimizing human resource development strategies.E-money, also known as electronic money, encompasses a broad range of digital transactions conducted through electronic devices, such as smartphones, computers, or specialized cards[1][2]. The proliferation of e-money systems has significantly transformed traditional payment methods, offering convenience and flexibility to consumers and businesses alike. However, harnessing the full potential of e-money requires innovative solutions to address emerging challenges and capitalize on evolving consumer behaviors.AI, with its capabilities in data analysis, pattern recognition, and decision-making, serves as a powerful tool to optimize e-money utilization and human resource development[3][4]. By leveraging AI algorithms, e-money platforms can enhance fraud detection, personalize user experiences, and streamline transaction processes. Furthermore, AI-driven analytics provide valuable insights into consumer preferences and market trends, enabling organizations to adapt their strategies proactively[5].

In the realm of human resource development, AI technologies offer novel approaches to talent acquisition, training, and performance evaluation. From automating repetitive tasks to facilitating personalized learning experiences, AI-driven solutions empower organizations to nurture a skilled workforce capable of driving innovation and achieving strategic objectives[6]. Moreover, AI-powered analytics enable HR professionals to make data-driven decisions regarding recruitment, retention, and talent development, thereby optimizing organizational effectiveness[7].

This paper explores the application of Artificial Intelligence to enhance e-money utilization and human resource development. By examining recent advancements, challenges, and opportunities in both domains, we aim to elucidate the transformative potential

1Universidad Nacional Autonoma de Alto Amazonas
Orcid code 0000-0003-1357-652X
2Universidad Nacional San Luis Gonzaga
Orcid code 0000-0003-2117-4344
3Universidad Nacional San Luis Gonzaga
Orcid code 0000-0002-8702-1503
4Universidad Nacional San Luis Gonzaga
Orcid code 0000-0002-0425-2032

of AI-driven solutions in shaping the future of digital finance and workforce management. Through case studies, empirical evidence, and theoretical frameworks, we seek to provide actionable insights for practitioners, policymakers, and researchers seeking to harness the synergies between AI, e-money, and human capital development[8][9]

The concept of applying Artificial Intelligence (AI) to enhance e-money utilization and human resource development revolves around leveraging AI technologies to optimize financial transactions and streamline workforce management processes. This concept integrates advancements in AI with the growing importance of digital finance and human capital development in modern organizations. Below are the key components of this concept[10]

E-Money Utilization: Fraud Detection and Prevention: AI algorithms are employed to analyze transaction data in real-time, identifying patterns indicative of fraudulent activities and enhancing security measures within e-money platforms.

Personalized User Experience: AI-driven recommendation engines and chatbots tailor user experiences by analyzing individual preferences, behavior patterns, and historical data, thereby increasing engagement and customer satisfaction.

Automated Transaction Processing: AI-powered automation tools streamline transaction processing, reducing manual errors, and improving operational efficiency through tasks such as account verification, payment processing, and reconciliation.

Human Resource Development:Talent Acquisition and Recruitment: AI-based systems assist in candidate screening, resume analysis, and interview scheduling, optimizing recruitment processes and identifying top talent efficiently.

Personalized Learning and Development: AI-driven learning management systems provide personalized training content and adaptive learning experiences, catering to individual learning styles and skill gaps within the workforce.

Performance Management and Feedback: AI technologies enable real-time performance tracking, continuous feedback mechanisms, and sentiment analysis, fostering a culture of transparency, accountability, and continuous improvement within organizations.

Integration and Optimization: Organizations strategically integrate AI solutions into e-money platforms and human resource management systems, aiming to optimize processes, reduce costs, and enhance overall performance.

Cross-functional collaboration between finance, technology, and HR departments ensures alignment in implementing AI-driven initiatives and leveraging data insights effectively. Continuous monitoring, evaluation, and refinement of AI applications are essential to adapt to evolving market dynamics, regulatory requirements, and user preferences.

Ethical and Regulatory Considerations: Organizations prioritize ethical AI practices, ensuring transparency, fairness, and accountability in algorithmic decision-making processes related to financial transactions and human resource management.

Compliance with data protection regulations and privacy laws is paramount, requiring robust data governance frameworks and secure handling of sensitive information.

Stakeholder education and engagement efforts promote awareness of AI's capabilities, limitations, and potential impact on e-money utilization and workforce development, fostering trust and acceptance among users and employees..

2. Background

Work incentives are part of the human resource management macro-process of compensation and salaries of the employees which can be financial and non-financial compensation that favor the organization's employees[11].

In 21st century organizations, influencing internal employees is one of the very significant incentives that personnel managers consider as a motivational strategy for the fulfillment of corporate purposes, such as incentives, which define as "attractive ways in which organizations offer their human talent so that they can contribute effectively and productively, where they meet the objectives set for their job and, therefore, for the organization" .[12][13] However, defines incentives as "payments made by the organization to its participants among them stand out: salaries, awards, social benefits, growth opportunities, job security, open supervision, praise, etc[14].

It is also defined as stimuli or incentives that lead to improve productivity and production in the organization. Incentives, also called compensations, can be monetary or non-monetary, which are described as providing social benefits and recognition within the company to the employee. These incentives are a strong influence on employees so that organizations meet their business objectives and have a positive impact on the work and

motivational climate, bringing with them improvements in communications and business productivity[15] [16]

Work incentives are an additional part of the employee's salary and seek motivation and compensation, which must be established organizationally and known by the employees[17][18]. These incentives can occur in any sector whether public or private, but they must be known by both parties through business and union policies that are established subject to agreements or negotiations in the medium or long term
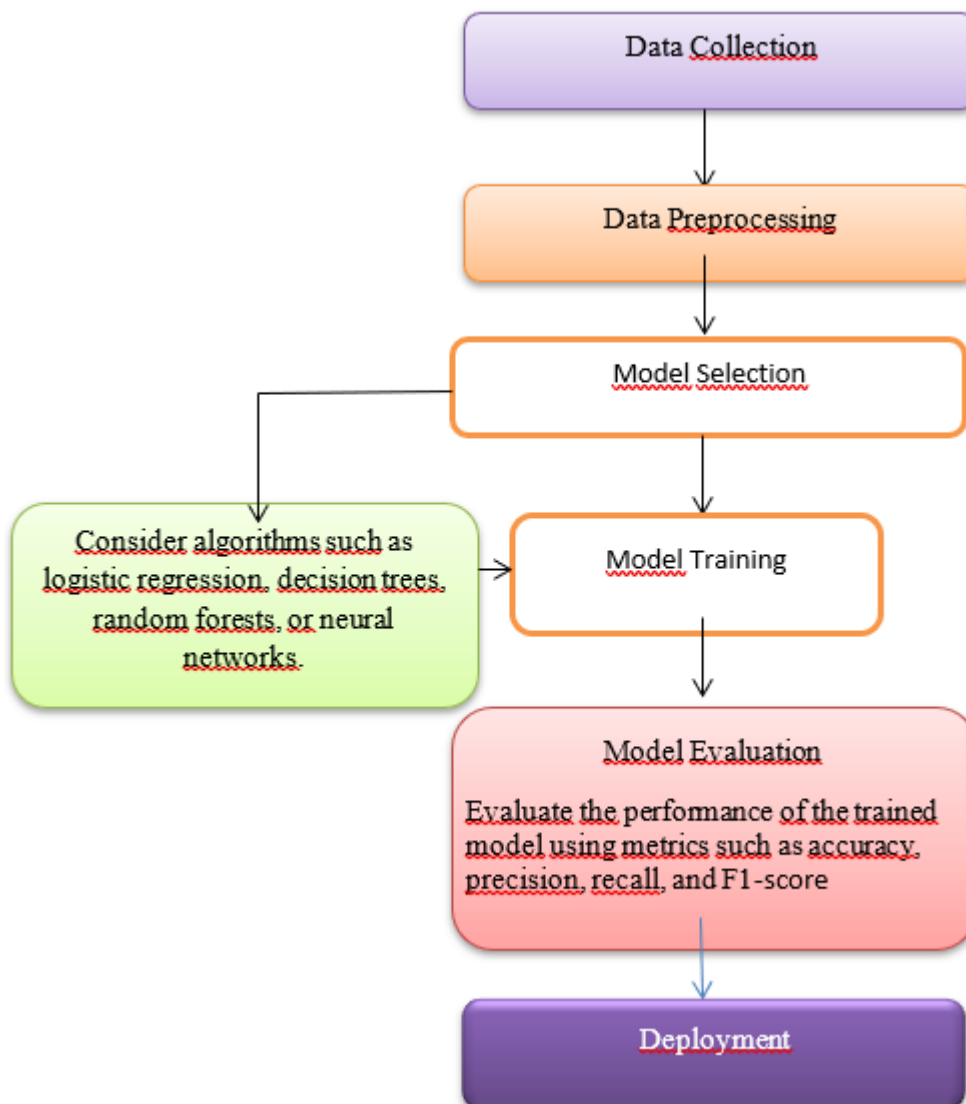

Fig 1. Machine Learning Flowchart for E-Money Utilization

3. Methodology

The research was developed in the agro-exporting company Peak Quality S.A. located in Pinillo lot GA, GB and GC Fundo San Ramon Pueblo Nuevo Ica, 17 years dedicated to the export of asparagus to the markets of the United States and Europe, with its employees are working during the productive campaign 2022.

The research has a quantitative approach of correlational type, explanatory level and ex post facto design of non-experimental character, which relates the variables: cause - effect. The population consisted of all the employees of its different lines of work, a total of 107 workers of which, following the probabilistic criteria, a sample of 47 employees was determined, which were obtained as follows:

Table 1 *Population of employees of the agroexporting company Peak Quality S.A., 2022*

Category	Number of employees
Camera operator	8
Wrapping operator	10
Sorting operator	28

Packing Operator	26
Maintenance Operator	2
Reception Operator	9
Cleaning Operator	9
Supervisors	5
Quality control operator	4
Security	2
Toconeros Operator	2
Coding operators	2
TOTAL	**107**

Note. Peak Quality Personnel Office 2022

Sample: The sample used was obtained from stratified probability sampling, the overall sample will be as follows:

n= $\frac{(1.96)^2(0.50)(0.50)(107)}{(0.050)^2(106)+(1.96)^2 (0.5)(0.5)}$ = 83.86061694 ≅ 84 sample elements

n= 84 sample elements

Below, we show how the final sample was obtained for the research..

n= $\frac{n}{1+\frac{n\{}{N}} = \frac{84}{1+\frac{84}{107}}$ = 47.05759162 = 47 *Elementos muestrales*

n=47

Table 2 *Research Population and/or Sample*

Category	Number of employees	Research Sample
Camera operator	8	6
Wrapping operator	10	8
Sorting operator	28	21
Packing Operator	26	20
Maintenance Operator	2	2
Reception Operator	9	7
Cleaning Operator	9	7
Supervisors	5	4
Quality control operator	4	3
Security	2	2
Toconeros Operator	2	2
Coding operators	2	2
TOTAL	**107**	**84**

Among the research techniques, we used the file and the survey with the respective instrument, content file and questionnaire, which contained questions of the variables: work incentives and electronic money, a total of 21 questions. As for the processing and classification of information, the data were organized, tabulated, tables and statistical representations of the data; and for the acceptance of the hypotheses of the research, the methods of Inferential Statistics of the Chi Square statistical test were used, at a confidence level of 95% and the contingency coefficient, using SPSS v. 25.

4. Results

For the acceptance of the research results, the hypotheses were contrasted using the inferential statistical method of Chi-square and endorsed by the contingency coefficient, for which the SPSS statistical package was used.

Contrasting the General Hypothesis.

Null hypothesis

Work incentives are positively related to the electronic money of the employees of the agroexport Company Peak Quality S.A., 2022.

Alternative Hypothesis: Ha

Work incentives are positively related to the electronic money of the employees of the agroexport company Peak Quality S.A., 2022.

The results obtained after the application of the Chi-square statistical methods and the contingency coefficient, were as follows:

Table 3 *Chi-square test Main hypothesis.*

	Value	df	Asymptotic significance (bilateral)
Pearson's Chi-square	51, 547a	32	,016
Likelihood ratio	48,146	32	,033
Fisher's exact test	43,569		
Linear by linear association	2,872^c	1	,090
N of valid cases	47		

Consequently, when obtaining the Chi-square value whose value was 51.547 >, with a confidence level of 95% and with 32 degrees of freedom in the spss, the result was a p value of 0.016 <0.05; deciding also to contrast by finding the contingency coefficient whose value is 0.723 which verifies that there is high intensity in the correlation between the variables of the study with a p value of 0.016< 0.05. In conclusion, the null hypothesis is rejected and the work incentives are positively related to the electronic money of the employees of the agro-exporting company Peak Quality S.A., 2022.

Other significant results:
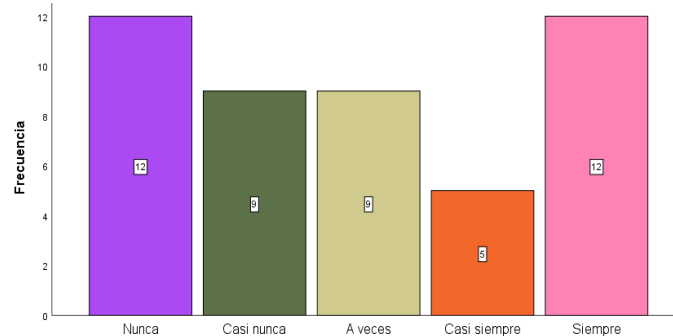
Fig 2: Employees' appreciation of their efforts and extra activities performed after their established workday and whether they receive any monetary incentive for it.

The statistical graph shows the appreciation of the internal employees of the agro-exporting company on the valuation they receive for their extra efforts, if they are rewarded with monetary incentives, 44.6% of them answer that they almost never or never see these efforts materialized in monetary incentives, likewise 19.1% say that sometimes they receive them while 46.1% say that almost always or always their extra activities in the company are rewarded.
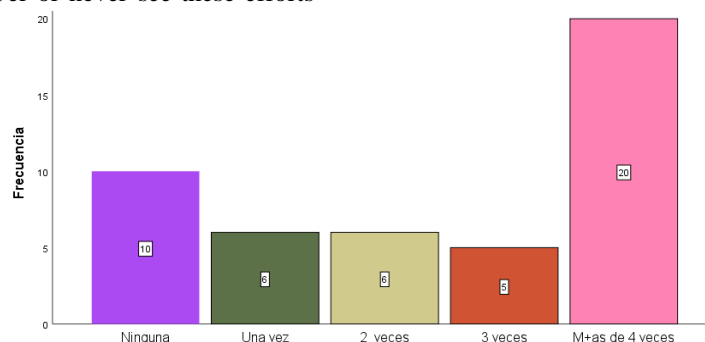

Fig 4 *Determination of the number of times they have received the special bonus for agricultural work BETA*

To the question asked to the sample elements of the research on the number of times they have received the special bonus for agricultural work BETA, 53.2% of them answered that they have received it 3 or more than 4 times, however, 25.6% said that they have received it once or twice, and 21.3% said that they have never received it.

Table 5 *Valuation of the monetary incentives they receive.*

		Frequency	Percentage	Valid Percentage	Cumulative percentage
Valid	Other	5	10,6	10,6	10,6
	Invest	7	14,9	14,9	25,5
	Pay debt	10	21,3	21,3	46,8
	Save	5	10,6	10,6	57,4
	Cover basic needs	20	42,6	42,6	100,0
	Total	47	100,0	100,0	
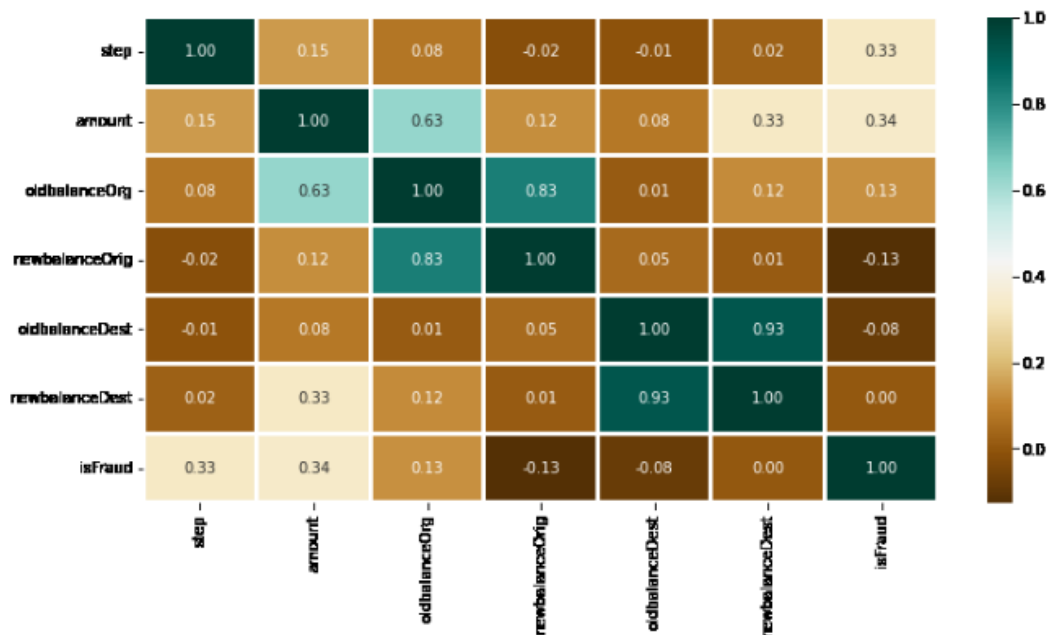
Fig 5: correlation among different features using Heatmap

The statistical table shows the summarized information about the valuation of the monetary incentives received by the internal employees, and 42.6% answered that they serve to cover their basic needs, however, for 31.9% the incentives they receive allow them to pay debts or save, but for 25.5% these monetary incentives are used to make investments or in other ways.

5. Conclusions

The fusion of AI and ML with e-money systems and human resource development holds transformative potential, offering opportunities for enhanced efficiency, personalized experiences, and sustainable growth. By embracing these technologies responsibly and collaboratively, organizations can unlock new frontiers in financial inclusion and workforce optimization, driving prosperity and progress in the digital era. the adoption of AI and ML in e-money utilization and human resource development also presents challenges. Concerns regarding data privacy, algorithmic bias, and ethical implications must be addressed to ensure equitable access and fair treatment. Furthermore, the evolving nature of AI technologies necessitates ongoing education and upskilling efforts to empower individuals to harness their full potential.

References

[1] Alnamrouti, A.; Rjoub, H.; Ozgit, H. Do Strategic Human Resources and Artificial Intelligence Help to Make Organisations More Sustainable? Evidence from Non-Governmental Organisations. Sustainability 2022, 14, 7327.

[2] Robbins, S.; van Wynsberghe, A. Our New Artificial Intelligence Infrastructure: Becoming Locked into an Unsustainable Future. Sustainability 2022, 14, 4829.

[3] Wang, M.; Pan, X. Drivers of Artificial Intelligence and Their Effects on Supply Chain Resilience and Performance: An Empirical Analysis on an Emerging Market. Sustainability 2022, 14, 16836.

[4] Carmichael, L.; Poirier, S.-M.; Coursaris, C.K.; Léger, P.-M.; Sénécal, S. Users' Information Disclosure Behaviors during Interactions with Chatbots: The Effect of Information Disclosure Nudges. Appl. Sci. 2022, 12, 12660.

[5] Ingole, K., & Padole, D. (2023). Design Approaches for Internet of Things Based System Model for Agricultural Applications. In 11th International Conference on Emerging Trends in Engineering & Technology - Signal and Information Processing (ICETET - SIP)

[6] Mahlasela, S.; Chinyamurindi, W.T. Technology-related factors and their influence on turnover intentions: A case of government employees in South Africa. Electron. J. Inf. Syst. Dev. Ctries. 2020, 86, e1.

[7] Bamiatzi, V.; Bozos, K.; Cavusgil, S.T.; Hult, G.T.M. Revisiting the firm, industry, and country effects on profitability under recessionary and expansion periods: A multilevel analysis. Strateg. Manag. J. 2016, 37, 1448–1471

[8] Otero-López, J.M.; Santiago, M.J.; Castro, M.C. Big Five Personality Traits, Coping Strategies and Compulsive Buying in Spanish University Students. Int. J. Environ. Res. Public Health 2021, 18, 821.

[9] Fernández-Mesa, A.; Alegre, J. Entrepreneurial orientation and export intensity: Examining the interplay of organisational learning and innovation. Int. Bus. Rev. 2015, 24, 148–156.

[10] Zhu, C.; Liu, A.; Wang, Y. Integrating organisational learning with high-performance work system and entrepreneurial orientation: A moderated mediation framework. Front. Bus. Res. China 2019, 13, 1–24

[11] North, K.; Kumta, G. Knowledge Management: Value Creation through Organizational Learning; Springer: Cham, Switzerland, 2018.

[12] De Raad, B. The Big Five Personality Factors: The Psycholexical Approach to Personality; Hogrefe & Huber Publishers: Göttingen, Germany, 2000.

[13] John, O.P.; Srivastava, S. The Big-Five Trait Taxonomy: History, Measurement, and Theoretical Perspectives. 1999. Available online: https://personality-project.org/revelle/syllabi/classreadings/john.pdf .

[14] Benet-Martínez, V.; John, O.P. Los Cinco Grandes across Cultures and Ethnic Groups: Multitrait-Multimethod Analyses of the Big Five in Spanish and English. J. Pers. Soc. Psychol. 1998, 75, 729–750.

[15] John, O.P.; Donahue, E.M.; Kentle, R.L. The Big Five Inventory; Versions 4a and 54; University of California: Berkeley, CA, USA, 1991.

[16] Digman, J.M. Personality Structure: Emergence of the Five Factor Model. Annu. Rev. Psychol. 1990, 41, 417–440.

[17] Verma, R.; Bandi, S. Challenges of artificial intelligence in human resource management in Indian IT sector. In Proceedings of the XXI Annual International Conference, New Delhi, India, 4–5 January 2020; Available online: https://www.internationalconference.in/XXI_AIC/TS5E/MsRichaVerma.pdf.

[18] McRobert, C.J.; Hill, J.C.; Smale, T.; Hay, E.M.; Van der Windt, D.A. A multi-modal recruitment strategy using social media and internet-mediated methods to recruit a multidisciplinary, international sample of clinicians to an online research study. PLoS ONE 2018, 13, e0200184.