ISSN: 2321-2152

IJMECE

International Journal of modern electronics and communication engineering

E-Mail
editor.ijmece@gmail.com
editor@ijmece.com

www.ijmece.com

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

SMART WALLET: AI-INFUSED IOT DEVICES FOR FINANCIAL SECURITY

AKULA SIREESH KUMAR REDDY [1] , BOYAPATI SAI PAVAN [2] , J MVEERENDRA KUMAR SWAMY [3] , PASALA HEMANTH [4] , POTHURAI HEMANTH REDDY [5] , T YASWANTH KUMAR [6], S. FEROZ SHAH AHMED [7]
[123456]UG STUDENTS, DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING, DR.K.V.SUBBA REDDY INSTITUTE OF TECHNOLOGY, KURNOOL,AP, INDIA.
[7] ASSISTANT PROFESSOR, DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING, DR.K.V.SUBBA REDDY INSTITUTE OF TECHNOLOGY, KURNOOL,AP, INDIA

Abstract: The AI IoT-Based Financial Security System provides a smart and secure solution for managing financial transactions and enhancing security. This project integrates IoT for real-time data communication and AI for intelligent decision-making. It utilizes an Arduino microcontroller to interface with a keypad, LCD display, Wi-Fi module, and a machine learning model running on a laptop to analyze transaction patterns, detect anomalies, and ensure the authenticity of users. Alerts and updates are sent to a mobile application via IoT platforms, offering users a convenient and secure financial management system.

1. INTRODUCTION

With the increasing reliance on digital financial systems, security is paramount. Traditional methods often fail to address dynamic threats like fraudulent transactions or unauthorized access. This project introduces a robust solution that combines IoT for connectivity and AI for intelligent threat detection, ensuring secure financial operations

A smart city is a city that deploys information and communications technologies (ICT), including Internet of Things (IoT) devices such as sensors, smart meters, etc. to help plan and manage urban infrastructure and overall improve citizens quality of life [36,56].Smart cities employ digital technologies and interconnected systems to support critical infrastructures needed in the city such as energy, health, transportation, etc. [35,56]. Due to population increase the demand of mobility has progressively increased as well, leading to notable issues such as increasing traffic congestion and delays, collisions, and accidents mostly due to human errors(Hansen et al., 2020; [43]). Although transportations have played a focal role

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

urban development and have proven to be a stimulus for economic growth which positively impact the sustainability of economies? Researchers such as Hansen et al. (2020) advocated for studies focused in adapting urban mobility to provide an efficient, safe, effective, and sustainable mode of travel. The advancements in disruptive technologies, such as the Artificial intelligence (AI), IoT and Distributed Ledger Technologies (DLT)systems have transformed a broad spectrum of smart city solutions.

AI offers autonomous decision-making capabilities similar to humans, and over the years AI has rapidly progressed to executing both simple and complex tasks in different domains [22]. When AI is applied in smart cities these systems exhibit behaviors similar to human intelligence for learning, planning, reasoning, and solving problems [30, 55]. Moreover, advancements in AI are also antic-pated to be key enablers of future innovations in smart cities such as intelligent robots or autonomous driving, conversational agents,etc. [65]. The IoT comprises of a distributed network connecting physical devices or objects that are capable of acting on or sensing their environment and capable of communicating with each other, other machines, devices, or computer systems. IoT function and offers different kinds of intelligence and data using a variety of sensors (Hansen et al., 2020). IoT devices help to establish a digital ecosystem that enables a systematic and automated data collection, processing, sensing, analyzing, and communication processes managed, regulated, and monitored with less human intervention [2,8]. Furthermore, DLT employs a decentralize peer-to-peer approach among participants without any intermediary or a trusted third party to governs and provide secure access to a shared ledger of data and transactions. DLT is needed to manage access control for traffic management systems, travel predictions, routing, road conditions, or to secure the intelligent transport systems of autonomous cars Jnr, 2024). DLT can be applied to address mobility related issues such as data availability, ownership, access and sharing in the transportation sector today has continue to be hindered due to different standards, unclear regulatory policies, the lack of data usage control, among others. Also, DLT can be utilizedto provide smarter mobility solutions such as real-time traffic management, traffic routing and navigation, on-demand mobility,seamless intermodal

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

trips, first and last mile, intelligent personal travel assistant, etc. (Jnr, 2024)

Findings from the literature suggest that the deployment of AI and DLT has transformed supply chains by digitizing manual-based processes, facilitating trustworthy data sharing, and enabling autonomous transactions ([51,40]). Moreover, the convergence of AI addle can revolutionize smart city infrastructures to achieve sustainable ecosystems for IoT systems. AI helps to analyze and generate insights from data produced from IoT to provide interpretation that improves intelligent mobility services by detecting patterns and optimizing urban mobility. Hence, to analyzes data produced from IoT, AI can be used to derived descriptive, prescriptive, and predicted inference to delivers scalable and efficient data driven mobility services in smart cities [8]. Thus, the confluence of AI and IoTAIoT, and DLT can be a key accelerator for enabling digitalization of cities into smarter and more sustainable cities. The integration of AIoT and DLT provide opportunities for supporting cities to develop smarter and sustainable infrastructures. Moreover, the deployment of AIoT and DLT can improve intelligent mobility services by facilitating seamlessly connection of heterogeneous devices, sensors, or and metering devices installed on public transport infrastructures. Accordingly, AI, IoT, and DLT can be leveraged to provide intelligent mobility solutions in smart cities for providing a safer, connected, and sustainable mode of travel for citizens(Hansain et al., 2020).

2. LITERATURE SURVEY

The society is witnessing an accelerated large-scale adoption of technology with transformative effects on daily transport operations, with cities now depending on data driven mobility services. Disruptive technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and decentralized technologies for example Distributed Ledger Technologies (DLT) are being deployed in smart cities. However, AI is faced with data security and privacy issues due to its centralized mode of deployment. Conversely, DLT which employs a decentralized architecture can be converged with AI to provide a secure data sharing across various IoT thereby overcoming the existing setbacks faced in deploying AI in smart cities. Evidently, the convergence of AI andIoT as AIoT and DLT have great potential to create novel business models for improved data driven services such as intelligent mobility in smart cities. Although research on the convergence of AI, IoT and

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

DLT exists, our understanding of its integration in achieving intelligent mobility services in smart cities remains fragmented as current research in this area remains scarce. Thisstudy bridges the gap between theory and practice by providing researchers and practitioners with insights on the potential benefits of converging AIoT and DLT. Grounded on the Technology Organization Environment (TOE) framework this study presents the technological, organizational, and environmental factors that impacts the convergence of AIoT and DLT in smart cities. Additionally, findings from this study present use cases on the applicability of AIoT and DLT to support intelligent mobility services in smart cities.

The main objective is to create a security system for wallet based on RFID technology and also keep an account of how much money is coming inside and going out of the wallet which is done using tcs3200 color sensor by which we can have an account of the amount of money spent and update the same on the mobile app. So, this project basically alerts the person if the wallet is missing from his/her pocket and also shares the location of the same and also gives the information of how much he/she has spent. The major components used in this paper include Raspberry PI, RFID Reader, RFID Tag, GPS Module, and andTCS3200 Color Sensor. Whenever the RFID card is placed nearto the reader, the RFID reader obtains the UID (unique key) information about the card. The location of the wallet is obtained using the GPS Module. This detail is notified to user when the wallet is not connected. The status obtained by the RFID reader and the GPS module is collected by Raspberry PI. Using the PI'sWIFI, the details are posted onto the cloud. All the details postedonto the cloud are accessed via the APP and also through awebsite portal in case of any emergencyKeywords: RFID Technology, Cloud, Android App, WIFI,Raspberry Pi, Internet of Things, Wallet, Fake currency detectionmethod.

The society is witnessing an accelerated large-scale adoption of technology with transformative effects on daily transport operations, with cities now depending on data driven mobility services. Disruptive technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and decentralized technologies for example Distributed Ledger Technologies (DLT) are being deployed in smart cities. However, AI is faced with data security and privacy issues due to its centralized mode of deployment. Conversely, DLT which employs a

decentralized architecture can be converged with AI to provide a secure data sharing across various IoT thereby overcoming the existing setbacks faced in deploying AI in smart cities. Evidently, the convergence of AI and IoT as AIoT and DLT have great potential to create novel business models for improved data driven services such as intelligent mobility in smart cities. Although research on the convergence of AI, IoT and DLT exists, our understanding of its integration in achieving intelligent mobility services in smart cities remains fragmented as current research in this area remains scarce. This study bridges the gap between theory and practice by providing researchers and practitioners with insights on the potential benefits of converging AIoT and DLT. Grounded on the Technology Organization Environment (TOE) framework this study presents the technological, organizational, and environmental factors that impacts the convergence of AIoT and DLT in smart cities. Additionally, findings from this study present use cases on the applicability of AIoT and DLT to support intelligent mobility services in smart cities.

3. EXISTING SYSTEM

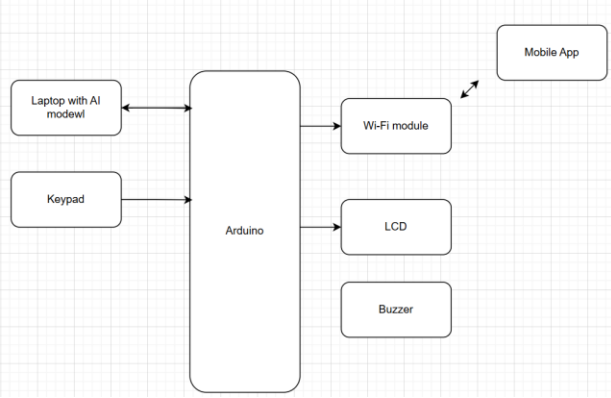
Evolving financial crime risks like money laundering and fraud in banking require the introduction of strong compliance frameworks alongside effective anti-money laundering (AML) approaches. Current AML systems battle to manage modern financial crimes because they produce high numbers of false positives and display operational inefficiencies. Artificial intelligence leads a transformative movement against security challenges through real-time transaction monitoring combined with anomaly detection and predictive analytics. AI-driven Anti-Money Laundering systems apply machine learning along with natural language processing capabilities and robotic process automation to improve fraud detection accuracy while cutting operational expenses and stick to regulatory standards. Through examination and measurable results this research showcases how AI adoption in AML applications leads to a 70% false positive reduction while boosting high-risk events detection by 30%. AI deployment within anti-money laundering mechanisms faces multiple implementation obstacles like poor data integrity and expensive solutions combined with unclear regulatory norms plus ethical dilemmas. Future research directions for enhanced financial security evolve from innovative prospects of explainable AI logies. These technological

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

enhancements create a safer and more transparent financial ecosystem while demonstrating AI's vital importance to worldwide financial stability.

4. PROPOSED SYSTEM

Machine learning in Artificial Intelligence (AI) changed financial institutions' approach to detecting money laundering activities. Machine learning represents one of Artificial Intelligence's essential techniques that demonstrates outstanding ability to detect anomalies. Machine learning models surpass traditional rule-based systems through their ability to detect abnormal activity by examining huge data compilations.. The proposed system of this project is shown in Fig 1.



User Authentication

The user enters their PIN on the keypad.

The Arduino verifies the PIN against a predefined set of valid entries.

Transaction Data Collection

After authentication, users input transaction details via the keypad.

The system logs details such as amount, date, and time, displaying them on the LCD.

Real-Time Monitoring and IoT Integration

Transaction data is sent to the IoT cloud via the Wi-Fi module.

Users can access this data through a mobile app for transparency and monitoring.

AI-Powered Anomaly Detection

Transaction data from the IoT cloud is fed into the AI model running on a laptop.

The model analyzes data to detect:

Unusual transaction patterns.

Sudden increases in transaction amounts.

Access attempts from unknown locations or devices.

If anomalies are detected, the system triggers alerts.

Alerts and Notifications

Real-time alerts are sent to the user via the mobile app and IoT cloud platform.

Unauthorized access attempts trigger the buzzer and block further actions.

Secure Logging

All transaction details are securely stored on the IoT cloud for audit purposes.

AI Model for Fraud Detection

Dataset:

Includes records of legitimate and fraudulent transactions.

Features: transaction amount, location, frequency, time of day, and user behavior.

ISSN 2321-2152
www.ijmece.com
Vol 13, Issue 1, 2025

Training:

Model trained using supervised learning techniques such as decision trees, support vector machines (SVM), or neural networks.

Inference:

Incoming transaction data is analyzed for potential fraud in real-time.

Output:

Anomalous transactions trigger alerts and block unauthorized actions.

Enhanced Security:

Combines hardware-based authentication with AI-powered anomaly detection.

Real-Time Monitoring:

Enables instant alerts and transaction reviews.

User Transparency:

Users can monitor their financial activity through a mobile app.

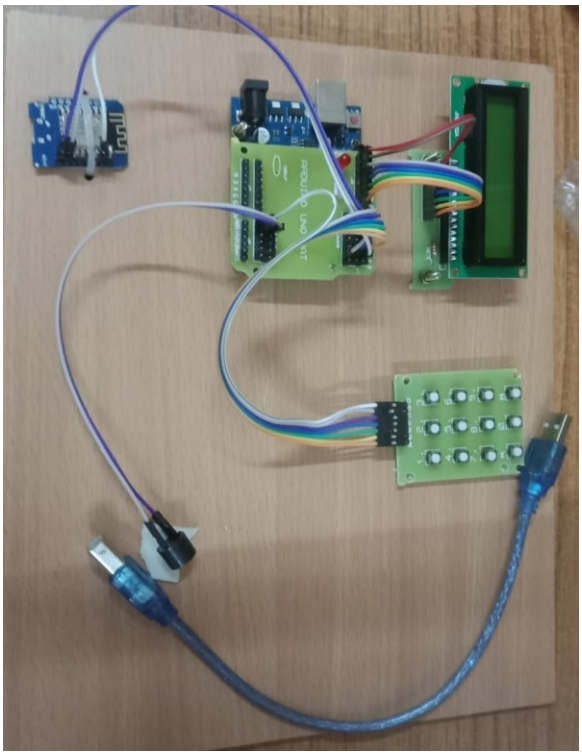
Fraud Prevention:

Proactively detects and blocks suspicious transactions.

Scalable Design:

Can be integrated into ATMs, POS systems, and digital wallets.

RESULTS



CONCLUSION

The AI IoT-Based Financial Security System offers a modern approach to securing financial transactions. By combining IoT connectivity, AI intelligence, and user-friendly interfaces, the system addresses the challenges of fraud detection and user transparency. This project demonstrates the potential of integrating AI and IoT to enhance security and trust in financial systems.

REFERENCES

[1] Agorbia-Atta, C., & Atalor, I. (2024). Enhancing anti-money laundering capabilities: The Strategic Use of AI and Cloud Technologies in Financial Crime

Prevention. World Journal of Advanced Research and Reviews, 23(2), 2035-47.

[2] Dr.M.V. Sruthi "Improved Face Recognition Using Optimized Linear Collaborative Discriminant Regression Classification With Hybrid Algorithm" in www.iosrjournals.org

[3] Kaur, G. (2023). Trust the Machine and Embrace Artificial Intelligence (AI) to Combat Money Laundering Activities. In Computational Intelligence for Modern Business Systems: Emerging Applications and Strategies (pp. 63-81). Singapore: Springer Nature Singapore.

[4] Josyula, H. P. (2024). Enhancing Security and Compliance. In Redefining Cross-Border Financial Flows: Transforming Remittances with AI and Other Technologies (pp. 49-64). Berkeley, CA: Apress.

[5] Turksen, U., Benson, V., & Adamyk, B. (2024). Legal implications of automated suspicious transaction monitoring: enhancing integrity of AI. Journal of Banking Regulation, 1-19.

[6] Balakrishnan, A. (2024). Leveraging artificial intelligence for enhancing regulatory compliance in the financial sector. International Journal of Computer Trends and Technology.

[7] Pingili, R. (2024). TRANSFORMING ANTI-MONEY LAUNDERING COMPLIANCE IN BANKING WITH AI-DRIVEN ROBOTIC PROCESS AUTOMATION.

[8] Sadiya, H., & Shah, H. Predictive Analytics and AI Integration: Revolutionizing AML and Fraud Detection in Financial Services.

[9] Oubari, Z., & Leontjeva, L. (2024). Maximizing Anti Money Laundering Compliance through AI: Assessing the Obligations and Responsibilities of Financial Institutions under the Proposed EU AI Act.

[10] Nicola, H. Harnessing AI and Predictive Analytics for Robust Anti-Money Laundering and Risk Mitigation in FinTech.

[11] Balaji, K. (2024, August). Artificial Intelligence for Enhanced Anti-Money Laundering and Asset Recovery: A New Frontier in Financial Crime Prevention. In 2024 Second International Conference on Intelligent Cyber Physical Systems and Internet of Things (ICoICI) (pp. 1010-1016). IEEE.

[12] Gupta, A., Dwivedi, D. N., & Shah, J. Artificial Intelligence Applications in Banking and Financial Services.

[13] Milon, M. N. U. (2024). Gravitating towards Artificial Intelligence on Anti-

Money Laundering A PRISMA Based Systematic Review. International Journal of Religion, 5(7), 303-315.

[14] Basu, D., & Tetteh, G. K. (2024). Using Automation and AI to Combat Money Laundering.

[15] Al-Shabandar, R., Lightbody, G., Browne, F., Liu, J., Wang, H., & Zheng, H. (2019, October). The application of artificial intelligence in financial compliance management. In Proceedings of the 2019 International Conference on Artificial Intelligence and Advanced Manufacturing (pp. 1-6).