

# Development of A Hybrid Near Field Communication Payment System for a Closed Community

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## Abstract:

Near Field Communication (NFC) is a wireless technology that enables secure data exchange over short distances, particularly for contactless payments and other applications. By utilizing electromagnetic radio fields, NFC establishes connections between devices, facilitating convenient and secure information transfer. This project focuses on developing a hybrid NFC payment system for a closed community, aiming to address concerns related to fraud, technical issues during online transactions, loss of access to purchased goods or services, and the security and privacy of personal information. The system comprises components such as a WiFi enabled microcontroller, a communication microcontroller, a display, and an NFC card reader, all interconnected on a printed circuit board (PCB) and powered by a regulated voltage supply. The evaluation of the project demonstrates successful collaboration among hardware, software, and firmware, resulting in a fully functional NFC device. Both online and offline transaction processes operate effectively, with transaction history and results accurately displayed on the software application and web application. Overall, this intelligent hybrid payment system, integrating NFC technology, hardware, software, and firmware, provides a secure, efficient, and user-friendly solution that effectively mitigates concerns related to online transactions, ensuring seamless transaction processes and reliable transaction records

**Published in:** [2023 2nd International Conference on Multidisciplinary Engineering and Applied Science \(ICMEAS\)](#)

**Date of Conference:** 01-03 November 2023

**Date Added to IEEE Xplore:** 05 January 2024

**ISBN Information:**

**DOI:** [10.1109/ICMEAS58693.2023.10379212](#)

**Conference Location:** Abuja, Nigeria

**I. Introduction**

Near-Field Communication (NFC) is a technology that enables communication between devices over short distances using radio waves. It has been widely adopted for use in a variety of applications, including mobile payment systems, [1][2][7][9]. The implementation of NFC for intelligent offline payment systems involves the use of NFC enabled devices, such as smartphones or smartwatches, to make payments at point-of-sale terminals without the need for an internet connection.

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