

UPI Based Smart Sanitary Napkin Vending Machine

<https://www.youtube.com/watch?v=jxlf4TSKrtg>

The UPI Based Smart Sanitary Napkin Vending Machine is an automated, contactless dispensing system designed to provide sanitary napkins efficiently in public and private spaces such as schools, colleges, hospitals, and workplaces. The system utilizes an ESP32 microcontroller integrated with a QR code-based UPI payment interface, enabling secure and seamless digital transactions. Once the user scans the QR code and completes the payment, real-time confirmation is received through an IoT module. A product detection sensor ensures the availability of napkins before dispensing, preventing unsuccessful vending operations. Upon successful payment verification, the DC motor controlled via a motor driver activates to dispense the sanitary napkin.

An LCD display is used to provide user instructions and status notifications, while a SMS alert system automatically notifies the administrator for stock refilling whenever the quantity becomes low. The system operates on an independent power supply, ensuring reliability and continuous operation. This smart vending solution promotes hygiene, accessibility, and privacy while reducing manual intervention and enabling convenient digital payments. The proposed solution is particularly beneficial for emergency access to sanitary napkins, supporting women's health and empowerment through smart technology.

Objectives:

- To develop an automated vending machine that can dispense sanitary napkins efficiently without human intervention.
- To integrate a secure UPI-based QR payment system for fast, cashless, and contactless transactions.
- To implement a GSM-based real-time monitoring system for stock level tracking and automated low-stock alert notifications via SMS.
- To ensure user privacy, hygiene, and emergency accessibility in public and institutional environments.

- To utilize an ESP32 microcontroller for controlling sensors, display, SMS alerts, and motor-based dispensing operations.

Components used:

- Esp32 Module.
- LCD display.
- QR code.
- DC motor with L293D DC motor driver.
- IR sensor.
- GSM module.

Software's used:

1. Arduino IDE for Embedded C programming.
2. Express SCH for Circuit design.

Block Diagram:

UPI-Based Smart Sanitary Napkins Vending machine

