

IoT Based Smart EVM-CS

Abstract

The inclusion of IoT technology within EVMs represents a new development in voting procedures that enhances security, transparency, and accessibility. This paper proposes an IoT-based Smart EVM with several components such as Arduino Uno, ESP32, Fingerprint Sensor modules, push buttons, OLED displays, LED indicators, and a buzzer.

The system also provides biometric authentication, secure data transmission to a cloud server, real-time vote tracking, and an interaction friendliness through auditory and visual feedbacks. The system deals with the core challenges that traditional EVMs are exposed to, such as tampering, impersonation, and a lack of transparency through the exploitation of these IoT components.

Therefore, the proposed Smart EVM can not only improve the security but also the efficiency and accuracy of an election. Moreover, more voter confidence in the integrity of the results is guaranteed. This paper further presents some of the potential issues that may arise with the adoption of the system, such as cybersecurity risks, infrastructure, and cost factors. In the long run, the IoT-based Smart EVM would result in more secure and transparent elections.

Introduction

This is the need for Electronic Voting Machines in this day and age, which makes the voting process also streamlined and faster, and thus speeding up the counting. However, traditional EVMs have also been criticized on several accounts of security flaws, transparency, and even voter verification. Most of them are dependent on the physical interface alone, which is not connected to any external network; hence, it poses a problem in real-time tracking of the election process and secure data transmissions. Tampering or fraud committed by an unscrupulous voter may go undetected, and this will rather undermine public confidence in the legitimacy of election results.

A new perspective for the modernization of EVMs through IoT technologies: This technology can be used to create a network for device-to-device communication, providing real-time data transfer as well as remote monitoring as well as enhanced security protocols. Collecting all these, IoT components like Arduino Uno, ESP32, fingerprint sensors, and cloud servers will create a much smarter and secured voting machine. It introduces IoT-based Smart EVM with integration of biometric authentication for the verification of voter identity, secure transmission of vote to a cloud server, and real-time monitoring of the election process. Therefore, proposed systems addressed all limitations of traditional EVMs by means of security, transparency, and usability both from voters and election officials' end.

