iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** IV **Month of publication:** April 2023

DOI: https://doi.org/10.22214/ijraset.2023.50420

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue IV Apr 2023- Available at www.ijraset.com

Secure and Efficient Electronic Voting Machine Using IoT

Ramesh Kalyan G[1], Bharanidharan K[2], Menaka P[3], Nivash M[4], Praveen Kumar M[5]
[1]*Assistant Professor, Department of Computer Science and Engineering, SNS College of Technology Coimbatore, India*
[2, 3, 4, 5]*Department of Computer Science and Engineering, SNS College of Technology Coimbatore, India*

Abstract: ***The Secured voting machine is developed to avoid all the apparel conditioning in the election process. Results are blazoned to every individual namer who suggested in the election, this point is lacking in the being electronic voting machine. Vote counting, affect assaying, affect publications are taking further time and also more homemade crimes happens in this process when we use current Electronic Voting Machine. We concentrated on the main issue that namer have to travel to their own native for advancing in the electronlike. The namer must go to the position where their namer ID is registered, also only they allow them to bounce. To develop a compact near field communication device for the choosers to poll their vote in order to have the voting process in a secured and effective introductory conception of this charge is to produce a digital voting system as a way to help to get relieve of defrauding of the homemade voting structures like paper- grounded voting system, in this there is a chance of casting vote further than formerly and prior. The proposed machine is which includes a couple of layers of verifications to insure the trust ability of the device. With the addition of biometric point detector, every namer is entered into the contrivance simplest after being diagnosed and checked with the given database of enlisted choosers. Once the corresponding point is matched with the records handed, the namer will be allowed to do for opting their preferred seeker from the panel of buttons. The final vote is also displayed onto a Liquid Cristal Display for the pride of choosers. The proposed design displays translucency and also carries the characteristic of being independent for the duration of the path of operation.***
Keywords: Electronic Voting system, Microprocessor, GSM module, RFID Reader, Arduino board, LCD, Database

I. INTRODUCTION

Electronic voting refer's to voting using electronic means to either aid or take care of the chores of casting and counting votes depending on the particular implementation ,e-voting may use standalone electronic machine (also called EVM)or computer to the internet .This concept describe an online electoral system for Indian election is proposed for 1st time there are number of voting system develop all over the world with each of them having it's limitation's this system uses the fingerprint sensor to scan thumb of the voter's in order to provide high performance with high security to the voting counter also as we using internet of thing i.e.(IOT)to make the voting system more practical. This system used to display the data-base of the user (voter). After receiving the Instruction from the polling officer, also the voter can use the touch screen to poll his/her vote. The internet of things (IOT) is the inter-networking of physical devices, vehicles, building and other items embedded with electronics, software, sensors, actuators and network connectivity which enables these objects to collect and exchange data. The IOT allows objects to sense or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based system, and resulting in improve efficiency, accuracy and economic benefit in addition to reduce human intervention.

II. LITERATURE SURVEY

We briefly review several related works on the verification system in voting process during the election process. Remote e-voting is accessible and provides easy access for choosers. On other hand, it makes it easier to count the votes and induce reports for election drivers. Over time e-voting systems were developed until it reaches the position that we've moment, and it is anticipated that they will continue to ameliorate in the future. nonetheless, lately there has been adding review of remote e-voting systems' security and integrity. Also, enterprises were raised about whether these systems can defend against cyberattacks. An effective remote e-voting system must meet a set of norms needed from nonsupervisory bodies. This paper discusses remote e-voting systems' design conditions as bandied in current literature. The advantage of Remote e-voting is accessible and provides easy access for choosers. On other hand, it makes it easier to count the votes and induce reports for election drivers. In the last decades, e-advancing systems were developed until it reaches the position that we've moment, and it's anticipated that they will continue to ameliorate in the future. In this paper, we bandied the design conditions for remote e- voting as surveyed from nonsupervisory bodies.

The disadvantages we examined whether the current public structure is able of supporting an effective remote e-voting system that meets the design. We set up that the current technology structure isn't sufficient to support effective remote e-voting systems, as the technologies that need to be enforced to meet the design conditions are victims of different cyber-attack

III. EXISTING SYSTEM

A five-meter connection connects the control unit and the ballooning unit, which make up the present EVM. The Balloting Unit is put within the voting compartment, while the Control Unit is placed with the Presiding Officer or a Polling Officer. The polling officer didn't hand out a ballot but instead by pushing the Control Unit's Ballot Button, the person in charge can release a ballot. The voter will thereafter be able to express his preference for the candidate and symbol of his choice by pressing the blue button on the voting unit.In Kerala's 70-Parur Assembly Constituency, EVMs were first utilised. Electricity is not required for EVMs. EVMs are powered by a standard battery made by Electronics Corporation of India or Bharat Electronics Limited.In a Balloting Unit, 16 candidates are allowed.

If there are more candidates than 16, additional balloting units may be connected (one for every 16 candidates), increasing the total number of candidates by a maximum of 64 by joining 4 balloting units. However, M3 EVMs can accommodate a maximum of 384 voters.by linking 24 Balloting Units candidates including NOTA If an EVM at a certain polling place breaks down, it is replaced with a new one.

It is okay to continue with the voting after replacing the EVM with a new EVM and there is no problem with the votes recorded up until the point where the EVM went out of order remaining safe in the memory of the Control Unit. The only people permitted in the area where votes are being tallied are the RO, the candidates with their respective election agents, counting agents, on-duty public employees, and authorized Election Commission Agents.

Before the counting starts, the agents and counting personnel examine the EVM. PB documents are counted initially. Thirty minutes after the PB counting starts, the EVM vote count gets underway. The EVMs are resealed once one round of counting is complete. The RO takes a two-minute break after each round so that the candidate or the election agent may request a recount. Recount request validity is determined by RO, who then takes appropriate action. After inconsistencies are resolved, the RO asks the Observers' permission before making an announcement about the outcome.

IV. PROPOSED SYSTEM

In the proposed method, voters would not need to go to the polling place where their voter ID was registered; instead, they may cast their ballot at any polling place that was close by and felt comfortable to them. The voting procedure is also made a lot simpler than it is now.

The voter must have their voting ID on them to the closest polling place, where they must then use the RFID reader in the EVM to scan their voter ID. The voter must enter the received OTP to prove their identification once the EVM sends an OTP to the mobile number associated with their specific voter ID. The details of that individual voter will be collected by the EVM once the OTP validation process is complete. The goal of this project is to develop and put into use a protected voting system that makes use of RFID technology.

The EVM is designed to significantly enhance the electoral process and prevent rigging. A microprocessor, an RFID reader, a GSM module, a database management system, and an LCD are all components of the system we designed. Display. Voters are instructed to swipe their voter identity card on an RFID reader when they visit the polling place to exercise their right to vote. The voter's voting status is determined by the microcontroller. If not, it prepares the voting machine to collect candidate information in a database before casting a ballot. Each and every voter goes through the same procedure. When a specific vote is cast, the information is also sent to the voter in message format.

A. Advantages

Voting will be more secure and efficient if voters may cast their ballots from anywhere by going to the closest polling place in their neighborhood.

1) A confirmation message is displayed on the screen to confirm the recorded vote and the voter.
2) Automated, precise, and effective vote counting, result analysis, and result reporting.
3) Voters receive confirmation messages, which increases the security of the voting process.
4) Results will no longer be published late.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue IV Apr 2023- Available at www.ijraset.com

V. MODULE DESCRPTION

The RFID Receiver built inside the EVM must be used by the voter to scan their voter identification. The database receives the ID information from the RFID receiver through GSM. GSM makes it possible for the voting machine to constantly sync with the database online. Candidate nomination documents must be submitted to the Electoral Commission. A list of candidates is then made public. No party is permitted to conduct political campaigning using public funds. Before elections, no party is permitted to bribe the candidates. During the election season, no new projects can be initiated by the government. Two days before election day, campaigning finishes at 6:00 p.m. The polls are open from 7:00 am until 6:00 pm. Voting is handled by the district's collector.

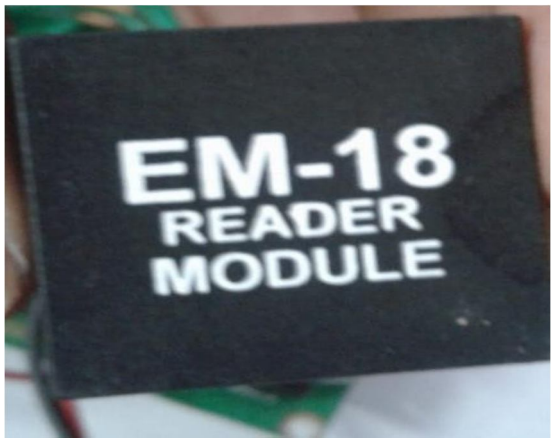


Figure 1.2 RFID reader

The government employs people. The list of candidates is displayed on the voting machine's LCD screen and the voting buttons are activated once the OTP has been validated. The voter can then select any button on the machine to select his candidate of choice. The voter ID is tagged as voted after the vote is logged in the database. And the mobile number associated with that voter receives a confirmation SMS. A voter who has already cast a ballot in an election cannot do so again because their record in the database shows that they have done so. This will enable us to implement the One Person, One Vote electoral system.


Figure 1.1 GSM module

"The paper trail of the new EVMs should make the voting process safer and tamper-proof," said BEL CMD Anil Kumar. We now have EC's specifications for EVMs, and work is underway to include new functionalities. A printer will be connected to the modified EVM software. The serial number and certain data will be printed out when you make your vote. It is done to make sure that the voting process is fair and error-free. " It appears that when a voter selects the candidate of his choice in the voting booth, EVM, a paper ballot including the candidate's name, symbol, and serial number will be printed. Later, the printouts will be used to verify the voting information contained in the EVMs. Speaking of additional features, he stated that the new EVMs will be more durable, smaller in size, and more powerful in terms of computation. The electronic voting machine's (EVM) voter- verified paper audit trail (VVPAT) mechanism. Once inside the voting booth, the voter selects the candidate they want to support by pressing the appropriate button.

Arduino is a prototype platform open- source grounded on an easy- to- use tackle and software. It consists of a circuit board, which can be programmed appertained to as a microcontroller and a ready- made software called Arduino IDE Integrated Development Environment, which is used to write and upload the computer law to the physical board. Arduino boards are suitable to read analog or digital input signals from different detectors and turn it into an affair similar as cranking a motor, turning LED on/ off, connect to the pall and numerous other conducts. You can control your board functions by transferring a set of instructions to the microcontroller on the board via Arduino IDE appertained to as uploading software. Unlike utmost former programmable circuit boards, Arduino doesn't need a redundant piece of tackle called a programmer in order to load a new law onto the board. You can simply use a USB string. also, the Arduino IDE uses a simplified interpretation of C making it easier to learn to program. Eventually, Arduino provides a standard form factor that breaks the functions of the micro- controller into a more accessible package.

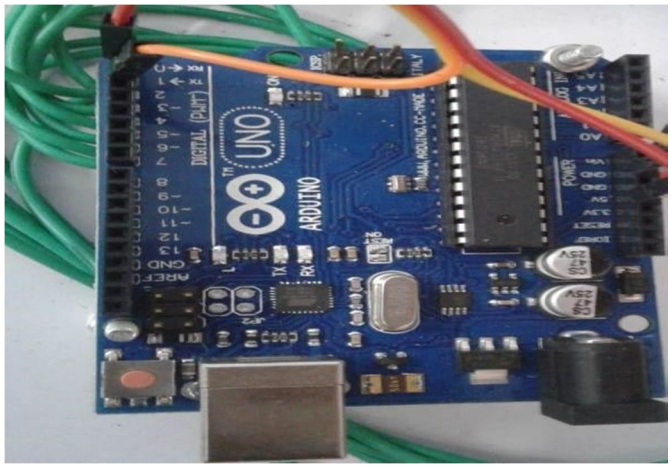


Figure 1.3 Arduino Board

To show that the vote has been cast, the ready light goes on, a red light illuminates next to the candidate button, and the control unit beeps loudly. The red light then changes on its own. Repeating this procedure for each voter. The person presiding over the election removes a plastic cap from the control unit and presses the close button to end the voting process. This stops the EVM from accepting any more votes. The control unit is stored until the public count, which could be weeks later after the ballot unit has been detached. The control units are supplied to a counting center on the day of the count.

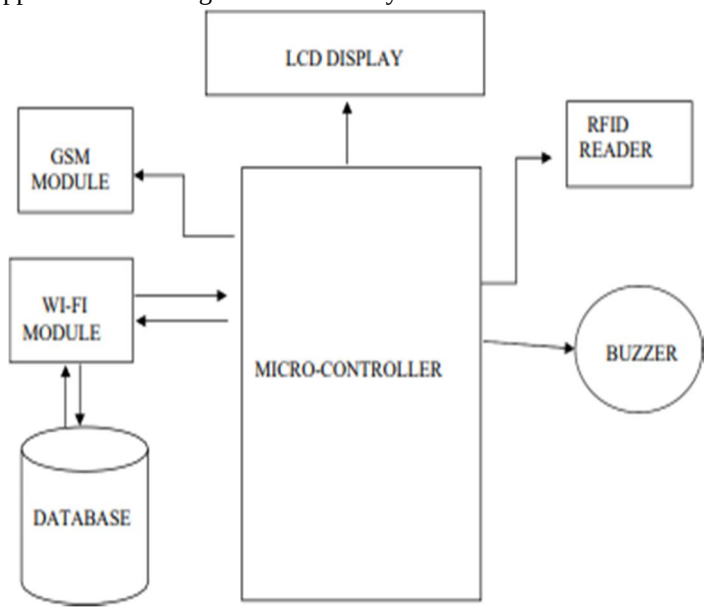


Figure 1.4 Module description

VI. COMPLETE MODULE

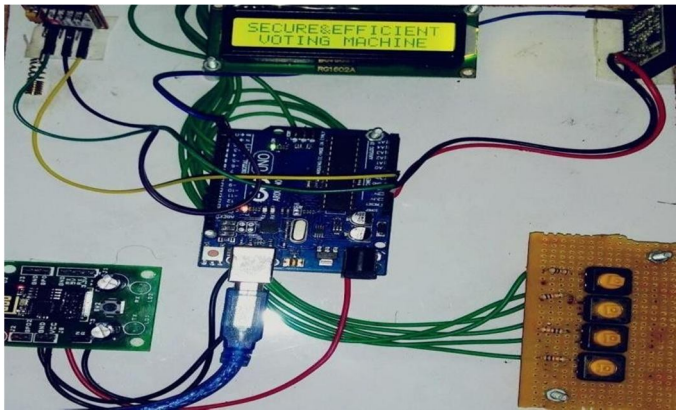


Figure 1.5 Secure Efficient Voting Machine

VII. FUTURE SCOPE

The voter's identification is only determined by their voter ID in this system. In the future, for a more secure election process, voters will also need to verify their identification by verifying their biometric, which will be integrated into the system. As a prototype for this project, we used a database of 20 voter IDs; OTP are transmitted to the previously saved and database-registered phone numbers. In actual polling places, there will be many more voters, therefore depending on the number of voters in a constitution, an external memory can be used. Future face-detection technology will be able to perform a second verification. By using this project, a voter can cast their ballot in person rather than by proxy or twice. In the future, in- depth research on e-voting should be conducted. In order to increase the effectiveness of the voting system, it planned to examine new technologies for dependable transmission. For improving the system and its services, it contains a new algorithm. This project can be expanded to a state like that. the Voter is able to cast his or her ballot through a computer, laptop, or mobile device. Before developing that system, all security considerations are taken into account. We are aware that it is challenging because there are numerous basic issues in some areas, but we can also create a hybrid system for them. These efforts are being made only for a brighter tomorrow.

VIII. CONCLUSION

The drawbacks of the current voting machine, which we previously described, are thus identified and addressed in the suggested system employing this Secured and Efficient Electronic Voting Machine using RFID and GSM. With the use of this method, voters can now cast their ballots in a polling place close by, which people's interest in voting in the election rises as a result of the stress associated with travel. In order to prevent any election rigging, the Secured voting machine was created. The designed method publishes more accurate findings and eliminates the possibility of manual error. Every voter who cast a ballot in the election is informed of the results; the current electronic voting equipment is missing this feature.

REFERENCES

[1] Alamleh, H., & AlQahtani, A. A. S. (2021, May). Analysis of the Design Requirements for Remote Internet-Based E- Voting Systems. In 2021 IEEE World AI IoT Congress (AIIoT) (pp. 0386-0390). IEEE
[2] Choudhry, S., Khosla, M., & Mehta, P. B. (Eds.). (2016). The Oxford handbook of the Indian constitution. Oxford University Press.
[3] Dagwar, E. M., Kawadkar, C., Nidhan, S., Kurhade, N. A., & Padole, K. G. (2016). Fingerprint Based Secured Voting System Using Iot.
[4] Ganesan, M. M. (2021). Biometric E-Voting with Multi Factor Authentication Using IOT Technology. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(13), 759-761
[5] Huzaifa Ahmed, M. R. N. Biplob, Md. Abdur Rahman, Rahil Rezwan,S. M.Shuvo,"Biometrically Secured Electronic Voting Machine",(2017) IEEE Region 10 Humanitarian Technology Conference (R10-HTC).
[6] Kankara, M. R., Thodupunuri, M., Yechuri, L. S., & Rao, N. K. (2017) Encrypted eVoting System using IoT.
[7] Kumar.M.D., Santhosh.A., Aranganadhanand.N.S., Praveenkumar. D. (2016), "Embedded System based Voting Machine System using Wireless Technology," International Journal of Innovative Re-search in Electrical, Electronics, Instrumentation And Control Engineering, vol. 4, no. 2, pp. 127 - 130.
[8] Lakshmi, D., Lakshmi, K. B., Anjali, G., & Hamsadwani, V. (2018). Effective and Secure E-Voting Application in GSM Module using IOT.
[9] Megalingam, R. K., Rudravaram, G., Devisetty, V. K., Asandi, D., Kotaprolu, S. S., & Gedela, V. V. (2022). Voter ID Card and Fingerprint-Based E-voting System. In Inventive Computation and Information Technologies (pp. 89-105). Springer, Singapore.
[10] R. Murali Prasad, Madhu Nakirekanti, Polaiah Bojja,(July 2016) "AADHAR based Electronic voting Machine using Arduino". International Journal of

Computer Applications (0975-8887) Volume 145 - No.12.

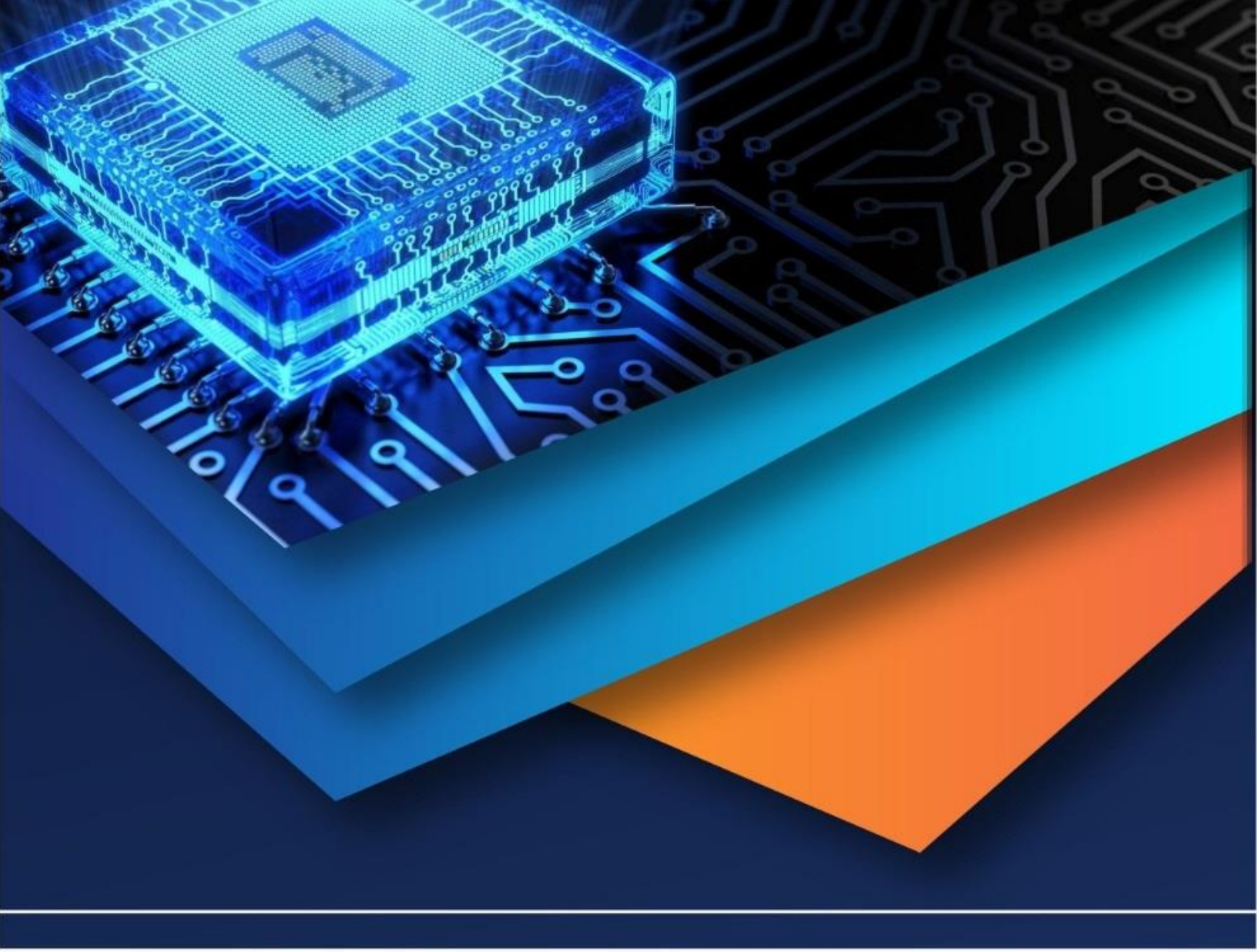
[11] R. Prabha, X. Trini, V. Deepika and C. Iswarya (2016), "A Survey on E- Voting System Using Arduino Software," International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, vol. 5, no. 2, pp. 687 – 690.

[12] M. R. Prasad, P. Bojja and M. Nakirekanti (2016), "AADHAR based Electronic Voting Machine using Arduino," International Journal of Computer Applications, vol. 145, no. 12, pp. 39 – 42.

[13] Rajesh, G. (2021). Smart Electronic Voting Machine Using IoT. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(10), 1547-1550.

[14] Rathee, G., Iqbal, R., Waqar, O., & Bashir, A. K. (2021). On the design and implementation of a blockchain enabled e-voting application within IOT-oriented smart cities. IEEE Access, 9, 34165-34176.

[15] Shankar, A., Pandiaraja, P., Sumathi, K., Stephan, T., & Sharma, P. (2021). Privacy preserving E-voting cloud system based on ID based encryption. Peer-to-Peer Networking and Applications, 14(4), 2399-2409



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY