

Secured UID-Card Based Identification System Using HMACMD5 Algorithm

A. Santhosh S¹, B. Ms. Pavithra A²

¹Santhosh S, M.Sc., Department of Computer Science and Engineering, Dr. MGR Educational and Research Institute, Chennai, India

²Pavithra A, Faculty, Centre of Excellence in Digital Forensics, Dr. MGR Educational and Research Institute, Chennai, India

Abstract: Motive of this design is to give a unique ID to each and every citizen of India while furnishing him system helps in managing a number for every person needs in his/ her lifetime. It provides security by relating illegal emigrants and terrorist. Citizens must register at the time of issue of birth instrument at RTO office or Collector office or Tahsildar office and get a word to pierce the site. ID card will be handed to every stoner after enrollment. latterly on they can change their word. During choices people can poll online. Government officers can corroborate details about a person from the database for issuing 1) Voter 2) Passport 3) License etc. OTP is stoutly generated when the stoner mileage for new service. This venture presents a secured recognizable proof framework utilizing UID cards and the HMAC-MD5 calculation. The framework upgrades security by encoding client distinguishing proof information with the HMAC-MD5 cryptographic strategy, guaranteeing information astuteness and privacy. Each UID card contains a one of a kind identifier, which, when handled through the HMAC-MD5 calculation, produces a secure hash utilized for verification. This strategy successfully ensures against unauthorized get to and information altering, giving a vigorous arrangement for secure personality confirmation in different applications such as get to control, monetary exchanges, and individual distinguishing proof. The execution illustrates progressed security, effectiveness, and unwavering quality in recognizable proof forms.

Keywords: UID Card, Identification System, HMACMD5 Algorithm, Secure Authentication.

I. INTRODUCTION

The Internet of Things (IoT) is weaving the physical world into a giant information web. Everyday objects, from thermostats to cars, are being embedded with sensors and software, allowing them to collect data

and connect with each other over the internet. This creates a network where devices can share information, automate tasks, and even make decisions based on real-time data. The result? Increased efficiency, improved decision-making, and a wave of innovative applications that are transforming how we live, work, and interact with the world around us [1]. The combination of Internet of Things (IoT) and Radio Frequency Identification (RFID) technologies marks a significant advancement in modern connectivity and data management. This fusion has revolutionized various industries, offering unparalleled The combination of Internet of Things (IoT) and Radio Frequency Identification (RFID) technologies marks a significant advancement in modern connectivity and data management [2]. This fusion has revolutionized various industries, offering unparalleled opportunities for automation, efficiency, and innovation. In this comprehensive overview, we will delve into the core components, applications, benefits, and challenges of IoT and RFID, as well as their synergistic relationship in shaping the future of technology. Opportunities for automation, efficiency, and innovation. In this comprehensive overview, we will delve into the core components, applications, benefits, and challenges of IoT and RFID, as well as their synergistic relationship in shaping the future of technology [3].

The Internet of Things (IoT) refers to the network of interconnected devices, sensors, and systems that communicate and exchange data over the internet. IoT devices have transformed everyday objects into intelligent entities capable of sensing, analysing, and responding to their environment. Key components of IoT include sensors, connectivity, data processing, and actuators.

Sensors play a crucial role in IoT, enabling devices to collect data from the physical world. These sensors can measure various parameters such as temperature, humidity, motion, light, and more. Connectivity allows IoT devices to transmit data to other devices or centralized servers via different communication protocols such as Wi-Fi, Bluetooth, ZigBee, or cellular networks. Data processing involves analysing the collected data either locally on the device or in the cloud to extract actionable insights. Actuators enable IoT devices to perform actions based on the processed data, such as adjusting settings, controlling switches, or triggering responses.

The applications of IoT are diverse and span across various domains, including smart homes, industrial automation, healthcare, agriculture, transportation, and smart cities. In smart homes, IoT devices allow homeowners to remotely monitor and control appliances, security systems, lighting, and heating/cooling systems for enhanced comfort, convenience, and energy efficiency. In industrial settings, IoT facilitates predictive maintenance, real-time monitoring of equipment and processes, and optimization of production workflows. In healthcare, IoT enables remote patient monitoring, wearable health devices, and personalized healthcare solutions. In agriculture, IoT sensors can monitor soil moisture, temperature, and other environmental factors to optimize crop yield and reduce water consumption. In transportation, IoT-enabled vehicles can communicate with each other and infrastructure for safer and more efficient transportation systems. Smart cities leverage IoT for traffic management, waste management, environmental monitoring, and public safety initiatives.

II. REVIEW OF LITERATURE

Amrutha Subrahmannian; Santanu Kumar Behera and at el., [4] had proposed Chip less RFID: A Unique Technology for Mankind. In today's computerized age, there's a developing request to supplant manual frameworks with mechanized ones. Chip less Radio Recurrence Distinguishing proof (RFID) innovation develops as a promising arrangement, advertising programmed distinguishing proof without the require for human intercession. Whereas optical barcodes have been overwhelming due to their moo taken a toll, they endure from impediments such as brief studied

separations, restricted data capacity, and manual operation prerequisites. Routine RFID innovation addresses these deficiencies but is frequently expensive. This article surveys chip less RFID, which presents preferences over existing Auto-ID advances. It gives an diagram of essential RFID frameworks, distinctive categories of RFID labels, and compares chip less RFID with conventional chipped RFID labels. Chip less RFID offers benefits such as cost-effectiveness and upgraded usefulness. The article talks about different classes of chipless RFID labels, challenges in their plan, and the rule of operation behind backscattering chipless labels, counting plan parameters like Radar Cross Segment (RCS). Furthermore, the article covers RFID tag printing, information capture procedures, materials utilized in tag fabricating, chipless RFID-based sensors, potential applications, and current challenges within the field. Generally, the article sheds light on the significance and future prospects of chipless RFID labels, highlighting their potential to revolutionize programmed recognizable proof frameworks.

Ankita Gupta, Afshan Asad, and at el., [5] had proposed IoT and RFID-Based Smart Card System Integrated with Health Care, Electricity, QR and Banking Sectors. This inquire about centers on leveraging IoT and RFID innovation to streamline day by day assignments and diminish the burden of carrying numerous cards for different purposes. With the noteworthy computerized change quickened by the COVID-19 widespread, there's a developing require for coordinates arrangements that streamline users' lives. The proposed framework points to computerize and coordinated different businesses into a single card framework, permitting clients to perform different errands with fair a tap of their RFID card. By uniting all daily-use cards into one RFID card, clients can kill the ought to carry numerous bank cards, distinguishing proof cards, and therapeutic cards. The keen card framework works on an electronic gadget prepared with the vital program to gather and oversee information from the RFID card. This kills the require for clients to carry physical archives and different bank cards, streamlining forms and decreasing manual exertion. In general, the objective of this investigate is to improve client comfort and productivity by coordination numerous businesses into a single RFID-based keen card framework.

Sreelekshmi S, T S Shabanam, and at el., [6] had proposed RFID based Smart Card for Campus Automation. This extend points to disentangle assignments for understudies by presenting a savvy card framework. Each understudy will get a card inserted with a interesting chip, serving as their character. These shrewd cards offer security benefits and improve believe between clients and organizations. The savvy card framework will serve numerous purposes, counting recognizable proof, computerization, and installment. Understudies can utilize the card for different exchanges rather than carrying cash. The card is filtered utilizing an RFID peruser, making it helpful for understudies to carry fair one card. We've too centered on progressing client openness to controls and administrations on campus. The savvy card framework doesn't store information specifically on the card itself but instep utilizes a server for an account-based framework. This setup increments exchange speed and upgrades security, guaranteeing a smooth and secure handle for understudies.

Prasad Kewale; Ashwin Gardalwar; and at el., [7] had proposed Design and Implementation of RFID Based E-Document Verification System. This inquire about proposes utilizing RFID innovation to make e-documents, comparative to e-passports, with implanted chips containing electronic data. The objective is to diminish the utilize of unlawful archives, upgrade security, and avoid fake record section into a nation, whereas moreover ensuring the owner's security. The inquire about creates an e-file confirmation gadget utilizing RFID innovation to streamline the confirmation handle and decrease human exertion. People are issued RFID cards containing circuits that store their data through radio recurrence tweak and demodulation. With the proposed equipment, the RFID-based e-document confirmation framework transmits electromagnetic signals to get to the put away information on the RFID card, encouraging simple, secure, and less labor-intensive archive confirmation. A comparative investigation illustrates the productivity of the RFID-based framework, with 100 reports confirmed in 500 seconds compared to manual confirmation, which took 3000 seconds. This demonstrates the framework to be six times more effective than ordinary strategies. This inquire about proposes utilizing RFID

innovation to make e-documents, comparative to e-passports, with implanted chips containing electronic data. The objective is to diminish the utilize of unlawful archives, upgrade security, and avoid fake record section into a nation, whereas moreover ensuring the owner's security. The inquire about creates an e-file confirmation gadget utilizing RFID innovation to streamline the confirmation handle and decrease human exertion.

Ashlin Jinushia R.; S. Senthilkumar; and at el., [8] had proposed Smart Monitoring System using RFID Technology. The assignment is made for utilizing RFID framework with ID card to require nearness of the understudy. These days, staffs use the paper to induce the attendance with the understudy nearness. There were numerous issues to induce understudy participation when utilizing the paper such as charlatan. For this, by utilizing RFID, teacher can effortlessly unravel the issue by planning an customary participation administration framework utilizing RFID and ID card. From this code is run to compare with the datasheet in Get to with ID card. At To begin with, teacher should fill the participation sheet with significant staff title, understudy name, roll no, lesson etc. This procedure is important by getting the data to utilize with the following step. Within the following prepare, staffs got to check to form association with RFID peruser. The participation method gets when RFID peruser gets prepared by swapping the card on RFID follower, a code gets produced from the ID card in differentiated and the database gets produced. At this point the code created with the database with specific understudy title, and ID number needs to seem on the interface which information will trigger into a rundown. In this, all data like understudy title and ID number will interface with the teachers title, understudy title, roll no and subject. On the off chance that the code isn't facilitated with database, it'll leads to the individual is in wrong lesson, the educator will select information by utilizing the enlisting data and it'll be revive into database.

Mrunal Fatangare; Pallavi U. Nehete; Leena Ravindra Mahajan; and at el., [9] had proposed Identification And Expenditure Tracking Using RFID Based Intelligent Card. In later a long time, RFID (Radio Recurrence Recognizable proof) innovation has seen

far reaching application development. One such application is in instructive teach, where RFID cards are utilized to streamline different assignments such as following understudy exchanges and overseeing participation records. The essential objective of this framework is to empower school or college staff to effectively track understudy exchanges and oversee participation in a basic way. Each understudy is given with an RFID card, which serves numerous purposes counting distinguishing proof, security, archive following, and cash exchanges. RFID innovation has assorted applications over businesses such as transportation, healthcare, farming, and neighborliness. It streamlines programmed inaccessible recognizable proof utilizing electronic inactive and dynamic labels with consistent perusers. This specific application centers on tackling common issues like live chat bolster and participation following utilizing RFID innovation. By robotizing these forms, it spares time that would ordinarily be squandered on manual participation frameworks, diminishing the probability of mistakes in participation following. Besides, the information collected can be utilized to create participation scores for understudies and help in authoritative decision-making. Moreover, the framework encourages utilizing RFID labels as keys for authorized bank accounts, permitting for secure administration of monetary exchanges related to understudy accounts.

III. RESEARCH METHODOLOGY

Citizen must enrol with essential subtle elements and after enlistment the citizen will get the special id card. The information of the citizen will be put away in primary database server counting the 16 digit number. The citizen will have the interesting id card with 16 digit number and the mystery key. The 16 digit number will be open to the public. The mystery key is static. The interesting number of the person will not be scrambled and put away within the database. The card can be utilized not as it were by the card holder but everybody can get to it. UID database is built by collecting information, putting away and connecting existing character database and the security of this database taken care of by biometric technology [10]. The mystery key is dynamic. While putting away within the database the one of a kind number will be scrambled and put away utilizing HMAC algorithm.

Once the card holder utilizes the card the mystery key will alter powerfully and the changed mystery key will be shown as OTP caution box.

Advantage:

The card cannot be utilised by anybody since the mystery key will be created dynamically. The client database is secure since the encryption calculation is used. Biometric is utilized for the security of system. Time sparing and Taken a toll effective. To have more prominent as well as border assurance and security.

Preparatory examination look at venture achievability, the probability the framework will be valuable to the organization. The most objective of the possibility think about is to test the Specialized, Operational and Temperate achievability for including unused modules and investigating ancient running framework. All framework is attainable in the event that they are boundless assets and unbounded time.

There are viewpoints within the achievability consider parcel of the preparatory examination

Preparatory examination look at venture achievability, the probability the framework will be valuable to the organization [11]. The most objective of the possibility think about is to test the Specialized, Operational and Temperate achievability for including unused modules and investigating ancient running framework. All framework is attainable in the event that they are boundless assets and unbounded time. There are viewpoints within the achievability consider parcel of the preparatory examination.

This think around is carried out to check the specialized achievability, that's, the specialized necessities of the system. Any system made must not have a tall ask on the available specialized resources. This will lead to tall demands on the open specialized resources. This will lead to tall demands being set on the client. The made system must have a humble prerequisite, because it was unimportant or invalid changes are required for executing this system. The viewpoint of consider is to check the level of affirmation by the client. This joins the strategy of planning the client to utilize the system beneficially. The client must not feel weakened by the system, instep must recognize it as a require [12]. The level of affirmation by the clients only depends on the procedures that are utilized to instruct the client about the system and to make him commonplace with it. His level of certainty must be raised so that he in addition able to form a couple of important input, which is

welcomed, as he is the extreme client of the system. An plan depiction may well be a formal depiction of a system, organized in a way that supports considering roughly the fundamental properties of the system. It characterizes the system components or building squares and gives a orchestrate from which things can be secured, and systems made, that will work together to execute the for the most part framework. This may enable one to supervise wander in a way that meets commerce needs. The natural organization of a system, epitomized in its components, their associations to each other and the environment, and the benchmarks regulating its arrange and progression. The composite of the arrange plans for things and their life cycle shapes. A representation of a system in which there's a mapping of value onto hardware and computer program components, a mapping of the program building onto the hardware plan, and human interaction with these components. An dispersed course of activity of physical components which gives the arrange course of action for a client thing or life-cycle plan aiming to satisfy the necessities of the valuable design and the necessities standard. Building is the first crucial, unpreventable, top-level, imperative advancements, choices, and their related bases nearly the in common structure (i.e., fundamental components and their associations) and related characteristics and conduct.

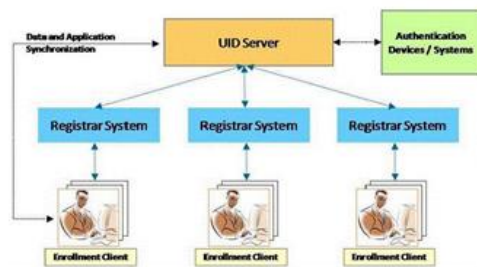


Fig.1: System Architecture

The reason of the enrolment module is to urge the user's points of interest such as Title, Finger Print and other significant data in arrange to include the individual effectively within the database as an authorized/ confirmed client to carry on encourage forms of the application i.e. exchange [13]. As it were after wrapping up the enrolment, an individual can logon to the framework to perform exchanges say DOB, Voter id, Permit, Passport etc...

Admin issue the Rfid Card once you are enlisted in DOB after that user's do not carry the archives fair

user's appear as it were the rfid card it'll show all the points of interest for that specific individual as well as we are doing multi exchange handle within the shrewd card. Shrewd cards give a implies of secure communications between the card and card per users. Comparable in concept to security conventions utilized in numerous systems, this include permits keen cards to send and get information in a secure and private way. This capability can be utilized by a framework to improve protection by guaranteeing that information sent to and from the card isn't catching or tapped into Biometrics. Savvy cards give components to safely store biometric formats and perform biometric matching capacities. These highlights can be utilized to make strides security in frameworks that utilize biometrics. For case, putting away unique mark formats on a savvy card instead of in a central database can be an viable way of expanding protection in a single sign-on framework that employments unique mark biometrics as the single sign-on credential.

User's security is centred i.e. the user's Finger Print given at the time of enlistment is implanted on a fake picture. The Finger Print isn't put away as such in database instep it is strongly scrambled. The initial Finger Print image has been part into three parts and after that the fake picture is implanted on it [14]. This fake picture is scrambled and put away in database. So this makes the client information to be in safer side. Consequently, indeed when the programmer hacks the database and tries to urge the user's subtle elements, the programmer will end up with fake one. Since the database contains the scrambled frame of fake pictures implanted on the first picture. Hence security is improved.

The monetary Organization's security is centred i.e. card holder is permitted to grant a stick number in conjunction with the introduction of RFID card. The stick number could be a four-digit number which can be put away as 16 bit esteem. The TID is additionally a 16-bit esteem but it'll be in Manchester code arrange. These two values which are the user's input one of a kind to each customer/card holder is securely stored in database as scrambled frame. The encryption performed may be a solid encryption conspire i.e. The primary 8 bit of RFID TID is concatenated with first 8bit of stick number and after that an encryption conspire is connected to scramble the concatenated bits, say X encryption conspire. Furthermore the

following 8 bit of RFID TID is concatenated with the following 8 bit of stick number and after that a diverse encryption plot is performed say 'Y' to scramble them. Confirmation is any handle by which you confirm that somebody is who they claim they are. This as a rule includes a username and a secret word, but can incorporate any other strategy of illustrating personality. In this extend the Finger Print and stick number is utilized for confirmation. Amid the confirmation, the client has got to grant the Finger Print and stick number. This will be done by the confirmation module by association with the confirmation module.

The user's Finger Print will be compared with the Finger Print picture given at the time of enlistment. The recovery of the initial Finger Print picture from the database includes the invert handle of implanting i.e. bad habit versa. In case the given user's Finger Print and the stick number is substantial, the client is permitted to perform the another prepare else the client is permitted to exit the framework. After confirming both the user's inputs, the client will be permitted to perform exchanges.

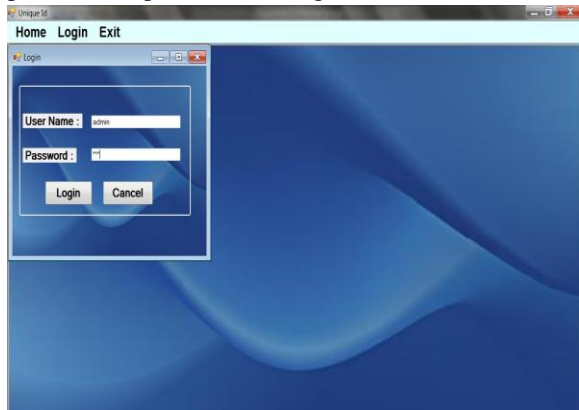


Fig.2: login site



Fig.4: Admin site

Keen cards give a implies of safely putting away information on the card. This information can as it were be gotten to through the savvy card working framework by those with legitimate get to rights. This highlight can be utilized by a framework to improve security by, for illustration, putting away individual client information on the card instead of in a central database. In this illustration, the client has superior information and control of when and by whom their personal information is being allowed get to.

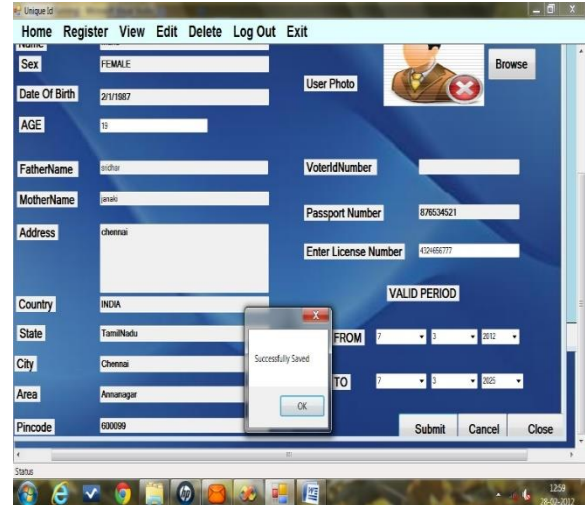


Fig.3 User page

Transaction module is used to perform user's processes such as

1. License Renewal
2. Passport Renewal
3. Voter id (we can use finger print or Iris and Rfid Card).

Result: The usage of the UID-card based distinguishing proof framework utilizing the HMAC-MD5 calculation yielded promising comes about in improving security and unwavering quality of character confirmation forms. Amid testing, the framework illustrated its capability to safely confirm clients by producing a interesting hash for each UID card, which was at that point confirmed against put away hashes to guarantee genuineness. This prepare successfully avoided unauthorized get to, as any change within the information brought about in a jumble, subsequently denying get to.

Execution assessments appeared that the framework seem handle a huge number of exchanges with negligible idleness, demonstrating its effectiveness

and reasonableness for high-traffic situations. The utilize of HMAC-MD5 given a adjust between security and computational overhead, guaranteeing that the framework remained responsive whereas keeping up vigorous security measures.

Furthermore, the framework demonstrated flexible against common security dangers such as replay assaults and information altering. The HMAC-MD5 calculation guaranteed information judgment by creating hashes that were exceedingly delicate to indeed the littlest changes in input information. This level of affectability made it essentially inconceivable for assailants to control the information without location.

Client input highlighted the system's ease of utilize and the consistent integration of security highlights into regular operations. The execution effectively illustrated that progressed cryptographic methods, when legitimately connected, can altogether improve the security and unwavering quality of distinguishing proof frameworks, making it a practical arrangement for different segments requiring secure personality confirmation.

IV. CONCLUSION

One of the key minutes of the Special ID Administration FOR Genuine TIME APPLICATION is that the administration of person personalities, their verification, authorization parts, and benefits or authorization inside or over framework and endeavour boundaries with the objective of expanding security and efficiency whereas diminishing taken a toll, downtime, and dreary assignments.

Future upgrade of the extend will select portable caution to card holders and it'll incorporate the administrations to container card, apportion card, bank administration.

In conclusion, the UID-card based recognizable proof framework leveraging the HMAC-MD5 calculation offers a considerable progression in secure personality confirmation. The integration of HMAC-MD5 guarantees that client information is scrambled and secured, giving a solid defense against unauthorized get to, information breaches, and altering. The one-of-a-kind identifiers on each UID card, combined with the strong hashing calculation, make a exceedingly secure environment for different applications, counting get to control, monetary exchanges, and individual recognizable proof. This framework not as

it were improves security but too moves forward productivity and unwavering quality, illustrating the adequacy of progressed cryptographic methods in defending touchy data. The victory of this execution highlights the basic part of secure recognizable proof frameworks in tending to modern security challenges over diverse segments.

REFERENCES

- [1] S. Shukla, A. Patil and B. Selvin, "A Step Towards Smart Ration Card System Using RFID & IoT," 2018 International Conference on Smart City and Emerging Technology (ICSCET), Mumbai, India, 2018, pp. 1-5, doi: 10.1109/ICSCET.2018.8537337. keywords: {Databases; Government; Wireless fidelity; RFID tags; Pins; Microcontrollers; RFID; IoT; Microcontroller; AWS;OTP}.
- [2] S. Sarkar, S. Manna and S. Datta, "Smart bag tracking and alert system using RFID," 2017 International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques (ICEECOT), Mysuru, India, 2017, pp. 1-4, doi: 10.1109/ICEECOT.2017.8284576.
- [3] H. Pereira, R. Carreira, P. Pinto and S. I. Lopes, "Hacking the RFID-based Authentication System of a University Campus on a Budget," 2020 15th Iberian Conference on Information Systems and Technologies (CISTI), Seville, Spain, 2020, pp. 1-5, doi: 10.23919/CISTI49556.2020.9140943.
- [4] C. PunithaDevi, T. Selvanayagi and D. J. Sylvia, "A survey on unique identity tag using RFID technology," 2017 Innovations in Power and Advanced Computing Technologies (i-PACT), Vellore, India, 2017, pp. 1-7, doi: 10.1109/IPACT.2017.8245135.
- [5] X. Li, Y. Zhou, C. Ai and L. Qian, "Smart Entrance Guard Control Based on RFID Card and ZigBee Authorization," 2014 Sixth International Conference on Measuring Technology and Mechatronics Automation, Zhangjiajie, China, 2014, pp. 589-592, doi: 10.1109/ICMTMA.2014.144.
- [6] A. V. Omkar, J. Goyal, R. Ranjeet, A. H. Nalband and M. R. Ahmed, "Design and Development of secure RFID Based Health Card for integrating Various Health Services," 2023 IEEE International Conference on Contemporary Computing and Communications (InC4), Bangalore, India, 2023, pp. 1-5, doi: 10.1109/InC457730.2023.10263151.

- [7] P. Chavan et al., "Smart Card Attendance Monitoring System Using RFID," 2023 International Conference on Computer Science and Emerging Technologies (CSET), Bangalore, India, 2023, pp. 1-6, doi: 10.1109/CSET58993.2023.10346694.
- [8] H. U. Zaman, J. S. Hossain, T. T. Anika and D. Choudhury, "RFID based attendance system," 2017 8th International Conference on Computing, Communication and Networking Technologies (ICCCNT), Delhi, India, 2017, pp. 1-5, doi: 10.1109/ICCCNT.2017.8204180.
- [9] Y. Punarvit, K. Sawant, K. P. k. R. Shankar and V. Kumar, "Implementation of Cashless Bus Ticketing System Using RFID and IoT," 2021 International Conference on Advances in Technology, Management & Education (ICATME), Bhopal, India, 2021, pp. 249-253, doi: 10.1109/ICATME50232.2021.9732728.
- [10] I. S. Akila, P. Pratheek and A. Poonia, "Smart Identity Card for Campus Automation," 2023 Innovations in Power and Advanced Computing Technologies (i-PACT), Kuala Lumpur, Malaysia, 2023, pp. 1-5, doi: 10.1109/i-PACT58649.2023.10434674.
- [11] N. A. S, R. S, S. Rajalakshmi, K. A. Saravanan and M. Revathy, "Log System for Mass Crowd and Live Tracking Using Radio Frequency Based on IoT," 2022 International Conference on Communication, Computing and Internet of Things (IC3IoT), Chennai, India, 2022, pp. 1-5, doi: 10.1109/IC3IOT53935.2022.9767908.
- [12] A. P. Abellon, C. J. Ariola, E. Blancaflor, A. K. Danao, D. Medel and M. Z. Santos, "Risk Assessments of Unattended Smart Contactless Cards," 2021 IEEE 8th International Conference on Industrial Engineering and Applications (ICIEA), Chengdu, China, 2021, pp. 338-341, doi: 10.1109/ICIEA52957.2021.9436788.
- [13] S. Gokul, S. Kukan, K. Meenakshi, S. S. V. Priyan, J. R. Gini and M. E. Harikumar, "Biometric Based Smart ATM Using RFID," 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT), Tirunelveli, India, 2020, pp. 406-411, doi: 10.1109/ICSSIT48917.2020.9214287.
- [14] R. A, S. P, V. E, J. R, R. R and S. C, "Transport Fee Management System for Educational Institutions," 2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS), Coimbatore, India, 2022, pp. 1928-1931, doi: 10.1109/ICACCS54159.2022.9785326.