Journal of Research Proceedings

JRP

Under the delegate of "Journal of Research Proceedings," we anchor a bimonthly electronic journal enclosing the diverse realms of the educational research field. JRP is providing a platform for the researchers, academicians, professionals, practitioners, and students to impart and share knowledge in the form of high quality empirical and theoretical research papers, case studies, literature reviews, and book reviews.

JRP Publications
www.i-jrp.com
journalrp.editor@gmail.com
9353189468

Multipurpose Card Using RFID Technology

Nagarathna C[1], BharathKR [2],SarathyV V [3]

Assistant Professor, CSEDepartment,SriKrishnaInstituteofTechnology,B'lore-560090,India[1]

Student, CSEDepartment,SriKrishnaInstituteofTechnology,B'lore-560090,India[2]

Student, CSEDepartment,SriKrishnaInstituteofTechnology,B'lore-560090,India [3]

ABSTRACT:

In this modern world, we carry different cards such as debitcards, credit cards for shopping or any money transactions, identity cards for identity or verification purposes, metrocards for traveling, special cards for tolls and parking and many more cards as such. The smart card implementation scan be seen around the globe but they are unique i.e. each developer uses different programming standards and data structures and each purpose has different cards. The smart card will provide service to the verified user only within a preferred area or an organization. To make available such multiple application access using a single card to every person we have planned to use RFID technology, which is cost-effective. As RFID technology is used in the proposed concept, the programming standards, and structures will be unified. Unlike the smart card, the multipurpose card using RFID technology can be used by every person to access different applications. Thus, a person needs not to carry several cards; he can just carry a single card for many purposes.

Keywords: RFID, Multipurpose.

I. INTRODUCTION

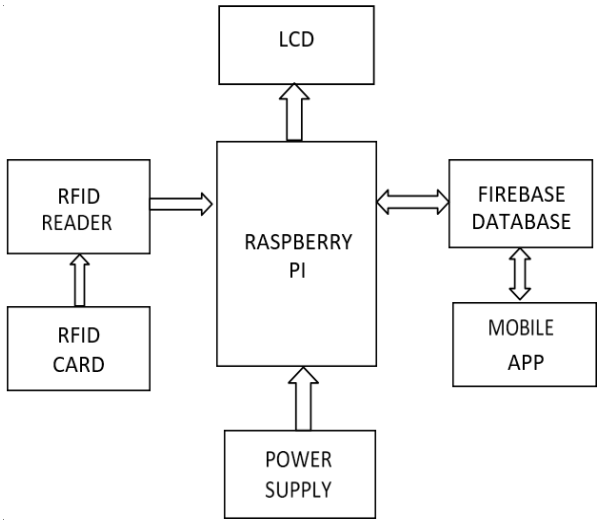
Radio Frequency Identification (RFID) is a technique that transmit information from such a RFID tag to the RFID reader, which processes the data stored on the tag to meet the needs of a particular use. RFID tags often feature a modest storage area that stores the tag's identifier. A distinctive identifier, exact location, or specific data that a developer will employ in the manufactured product are all examples of material that can be contained in the tag. An embedded system with just an antenna makes up an RFID tag. The tag has a storage capacity of 2 KB. The information stored on the RFID tag is retrieved using an RFID reader. The signal from either the RFID tag is received by the readers using radio waves from antennae. An RFID reader delivers radio frequency signals to the RFID tag, which absorbs them and transmits out a signal carrying data from the tag. The data from the RFID tag is then translated into electronic data that can be received by a system. The concept, which incorporates a card with an RFID [1-2], is designed to make a person's job easier. The versatile card could be used in a variety of locations, including toll booths, grocery stores, and any other location where an identification card is needed and payments are necessary. The cardholder's balance (amount) could always be replenished. Whenever the Rfid tag is scanned, the amount in the user's profile connected with the unique id is subtracted. With either the help of an RFID scanner, the RFID card is read. The cards can be used at tollgates, with the le pays based on the location and from some name entered in the system. It is also suitable for usage in retail malls. As a result, it is quite simple for an ability to hold a transportable card that is extremely secure. Another part of this study is that it allows the user to do financial transactions. To enable a student using the system, the admin must first sign up him and her and allocate an RFID tag with him or her. The persons personal tag carries identification number which will be used to identify them. When a customer encounters a Rfid tag and puts the tag upon on reader, the reader scans the identifier and checks to see if the ID would be in the database. The software will tell the administration that RFID tag also isn't recorded in the database system if indeed the identifier is not there. When the system recognises the RFID tag's unique ID, he is free to conduct all transactions. [3-4].

II. BACKGROUND STUDY(LITERATURE)

This is a unique card that is used for multi-purpose with the help of RFID technology. This survey aims to find RFID applications [5-9].

- **LittyRajan, Alpana Gopi, Divya P, and Surya Ranjan** proposed, " RFID is used for fastest mobile and sensing of sensor devices via radio waves, and it necessitates a Rfid system to access user knowledge when it comes into the awareness of the viewer, as well as the viewer recites the digital information and sends the data in "A Study on RFID Predicated Vehicle Authentication Using Only a Card," where an RFID tag is used for automobile verification with RFID [10].
- **Navaneeth, Megha P, Sruji N, Anusha T., and Haritha** have proposed a paper, "Students Smart Card using RFID" in which a student's smart card is developed using Radio Frequency Identification (RFID) technique is used to prevent the time delay and the rush during the registration. In this prototype, an RFID tag is used to carry the student details and needs to show, this tag to the RFID scanner.
- A paper named "**RFID Based Smart Master Card For BusTrainMetroTicketing**" in which a smart master card approach that integrates the smart cards for communication of all the transport systems together and allows for a single master card and a centralized system for all transportation areas(mediums). To demonstrate this concept of RFID tags and its uses, we use three RFID scanners as bus train and metro train smart card scanners respectively [11-12].
- **Subhash M.E., S. Gayathri, D. Gayathri** proposed an idea "Multipurpose Card Using RFID Technology" in which a smartcard for all in one purpose card using RFID technology in which a single card can be used for multiplepurposes such as personal identification card, card for toll and debitcard [13-17].

III. METHODOLOGY

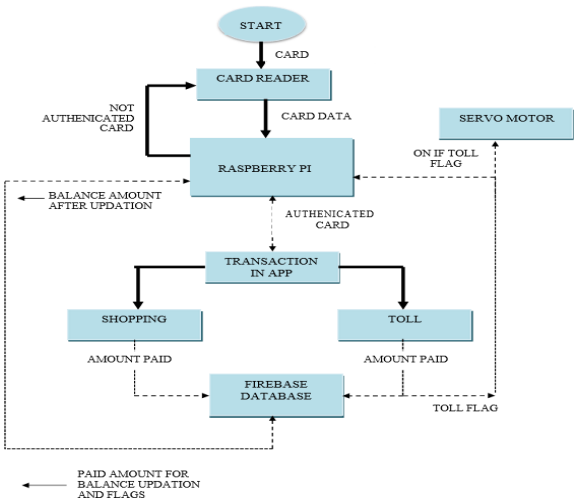


A methodology was developed to automated the safety assessment of industrial RFID systems. The tag is examined visually [18-19]. The name of the maker, the type, plus, in the some cases, the RFID standards are all included on many tags. It's indeed generally easier to collect a more specific quantity of information on how well the tags act and how to execute testing using this material. Identification of radiofrequency When there are no local government on the tag, the frequency of the RFID tag or card should be established first. LF tags, HF tags, UHF tags, or super-high frequency (SHF) tags can all be discovered in this situation. [20-22]. There are a variety of operating systems ways for determining the operating frequency of RFID tags, such as utilising a spectroscope or dismantling the tag or RFID readers to examine the iot communication computer hardware [23-29].

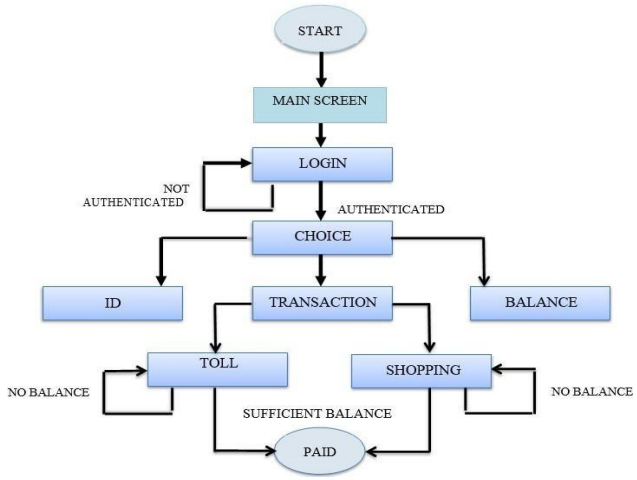
IMPLEMENTATION

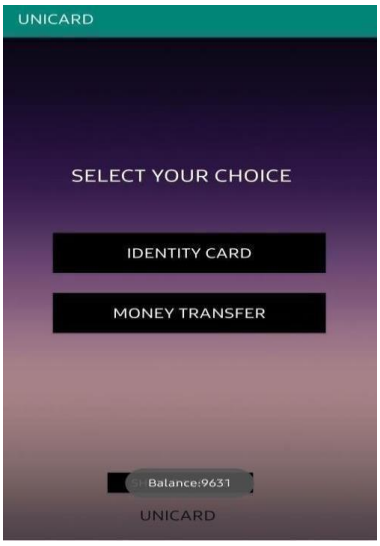
RFID readers and scanners are also called as interrogators, are devices which transmit and receive radio waves in order to communicate with RFID tags [30-34]. RFID reader has a signal generator block that generates radio waves of a particular frequency. The signal generated is used to detect the RFID tag and the data stored in it. The signal detected by the detect or emitted from the tag containing digital data is decoded to get the data in analog form by the microcontroller. RFID is also known as "radio-frequency identification" which refers to a technology in which the data encoded in RFID tags are captured by a reader via radio waves. The main reason behind the vast usage of RFID technology lies with the easier identification and tracking of objects with RFID tags as far as the object is within the range of the reader. RFID tag contains a microchip that has a transponder which when triggered by an interrogation pulse from the nearby RFID reader, the tag transmits the data stored in its memory [35-41].

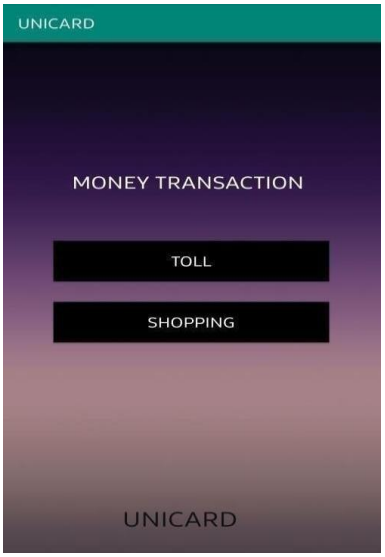
Workflow in Raspberry pi



Workflow of Android App







IV CONCLUSION

As technology grows day by day, we can imagine the future in which things we may occupy every place. This project simplifies the billing process, makes it swift & increases the security using the RFID technique. This will take the overall shopping experience to a different level which will much easier for users to use. By application of this project in real-time, we can avoid malfunctions, Time maintenance system, and a long wait on the Highways can be avoided.

REFERENCES

[1] Chakraborty, C., Roy, S., Sharma, S., Tran, T., Dwivedi, P. and Singha, M., 2021. IoT Based Wearable Healthcare System: Post COVID-19. The Impact of the COVID-19 Pandemic on Green Societiesenvironmental Sustainability, pp.305-321.
[2] Seyhan, K., Nguyen, T.N., Akleylek, S., Cengiz, K. and Islam, S.H., 2021. Bi-GISIS KE: Modified key exchange protocol with reusable keys for IoT security. Journal of Information Security and Applications, 58, p.102788.
[3] Fathima, N., Ahammed, A., Banu, R., Parameshachari, B.D. and Naik, N.M., 2017, December. Optimized neighbor discovery in Internet of Things (IoT). In 2017 International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques (ICEECCOT) (pp. 1-5). IEEE.
[4] Naeem, M.A., Nguyen, T.N., Ali, R., Cengiz, K., Meng, Y. and Khurshaid, T., 2021. Hybrid Cache Management in IoT-based Named Data Networking. IEEE Internet of Things Journal.
[5] KalyaniAdawadkar,"QuotesaboutPython".Python Software Foundation. Retrieved 8 January2012.
[6] ShraddhaDhomase,SamruddhiMahabaleshwarkar"Electronic Shopping Cart For Effective Shoppingbased on RFID", International Journal of InnovativeResearch In Electrical, Electronics, InstrumentationAndControlEngineeringVol.3,Issue1pp84-86,January2015.
[7] Ms. Vrinda, Niharika, "Novel Model for AutomatingPurchasesusingIntelligentCart,"e-ISSN:2278-0661,p-ISSN;1;2278.8727Volume16,Issue1,Ver. VII (Feb. 2014),PP23-30.
[8] Mr.P. Chandrasekar and Ms.T. Sangeetha "SmartShoppingCartwithAutomaticBillingSystemthroughRFIDandZigBee",IEEE, 2014.
[9] LITTYRAJAN,ALPANAGOPI,DIVYAPand SURYA RAJAN, "A Survey on RFID Based VehicleAuthenticationUsing ASmartCard".
[10] Boregowda, S.B., Babu Prasad, N.V., Puttamadappa, C. and Mruthyunjaya, H.S., 2015. Energy Balanced Fixed Clustering protocol for Wireless Sensor Networks. International Journal of Computer Science and Network Security, 11(8), pp.166-172.
[11] Sreevathsa, C.V., Daina, K.K., Hemalatha, K.L. and Manjula, K., 2016, July. Increasing the performance of the firewall by providing customized policies. In 2016 2nd International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT) (pp. 561-564). IEEE.
[12] Navaneeth,MeghaP,SrujiN,AnushaT.andHaritha"StudentsSmart CardusingRFID"J.Subhash M.E., S. Gayathri, D. Gayathri,"Multipurpose Card Using Rfid Technology. AdityaBodake,VirajBaviskar,"MultipurposeSmartcardSystem", (2012).
[13] Arun, M., Baraneetharan, E., Kanchana, A. and Prabu, S., 2020. Detection and monitoring of the asymptotic COVID-19 patients using IoT devices and sensors. International Journal of Pervasive Computing and Communications.
[14] Chakraborty, C., Roy, S., Sharma, S., Tran, T., Adhimoorthy, P., Rajagopalan, K. and Jebaranjitham, N., 2021. Impact of Biomedical Waste Management System on Infection Control in

the Midst of COVID-19 Pandemic. The Impact of the COVID-19 Pandemic on Green Societiesenvironmental Sustainability, pp.235-262.
[15] Rachana, C.R., Banu, R., Ahammed, G.A. and Parameshachari, B.D., 2017, August. Cloud Computing–A Unified Approach for Surveillance Issues. In IOP Conference Series: Materials Science and Engineering (Vol. 225, No. 1, p. 012073). IOP Publishing.
[16] Subramani, Prabu, K. Srinivas, R. Sujatha, and B. D. Parameshachari. "Prediction of muscular paralysis disease based on hybrid feature extraction with machine learning technique for COVID-19 and post-COVID-19 patients." Personal and Ubiquitous Computing (2021): 1-14.
[17] Hemalatha, K. L., S. M. Ashitha, and S. R. Meghana. "Design and implementation of modified FCM in the detection of brain tumor." Int. J. Adv. Sci. Res. Eng 3, no. 4 (2017): 2850-2858.
[18] Y. Gong, L. Zhang, R. Liu, K. Yu and G. Srivastava, "Nonlinear MIMO for Industrial Internet of Things in Cyber–Physical Systems," IEEE Transactions on Industrial Informatics, vol. 17, no. 8, pp. 5533-5541, Aug. 2021, doi: 10.1109/TII.2020.3024631.

[19] C. Feng, K. Yu, M. Aloqaily, M. Alazab, Z. Lv and S. Mumtaz, "Attribute-Based Encryption with Parallel Outsourced Decryption for Edge Intelligent IoV," IEEE Transactions on Vehicular Technology, vol. 69, no. 11, pp. 13784-13795, Nov. 2020, doi: 10.1109/TVT.2020.3027568.

[20] S. Chen, L. Zhang, Y. Tang, C. Shen, R. Kumar, K. Yu, U. Tariq, and A. K. Bashir, “Indoor Temperature Monitoring Using Wireless Sensor Networks: A SMAC Application in Smart Cities”, Sustainable Cities and Society, vol. 61, p. 102333, July 2020.

[21] K. Yu, L. Lin, M. Alazab, L. Tan, B. Gu, “Deep Learning-Based Traffic Safety Solution for a Mixture of Autonomous and Manual Vehicles in a 5G-Enabled Intelligent Transportation System”, IEEE Transactions on Intelligent Transportation Systems, doi: 10.1109/TITS.2020.3042504.

[22] L. Zhen, Y. Zhang, K. Yu, N. Kumar, A. Barnawi and Y. Xie, "Early Collision Detection for Massive Random Access in Satellite-Based Internet of Things," IEEE Transactions on Vehicular Technology, vol. 70, no. 5, pp. 5184-5189, May 2021, doi: 10.1109/TVT.2021.3076015.

[23] L. Tan, K. Yu, A. K. Bashir, X. Cheng, F. Ming, L. Zhao, X. Zhou, “Towards Real-time and Efficient Cardiovascular Monitoring for COVID-19 Patients by 5G-Enabled Wearable Medical Devices: A Deep Learning Approach”, Neural Computing and Applications, 2021, https://doi.org/10.1007/s00521-021-06219-9.

[24] Nguyen, Ngoc-Tu, Ming C. Leu, and Xiaoqing Frank Liu. "RTEthernet: Real-time communication for manufacturing cyberphysical systems." Transactions on Emerging Telecommunications Technologies 29, no. 7 (2018): e3433.

[25] Rajendrakumar, Shiny, V. K. Parvati, B. D. Parameshachari, KM Sunjiv Soyjaudah, and Reshma Banu. "An intelligent report generator for efficient farming." In 2017 International Conference on Electrical, Electronics, Communication, Computer, and Optimization Techniques (ICEECCOT), pp. 1-5. IEEE, 2017.

[26] Nguyen, Tu N., Bing-Hong Liu, and Shih-Yuan Wang. "On new approaches of maximum weighted target coverage and sensor connectivity: Hardness and approximation." IEEE Transactions on Network Science and Engineering 7, no. 3 (2019): 1736-1751.

[27] Rajendrakumar, Shiny, and V. K. Parvati. "Automation of irrigation system through embedded computing technology." In Proceedings of the 3rd International Conference on Cryptography, Security and Privacy, pp. 289-293. 2019.

[28] Le, Ngoc Tuyen, Jing-Wein Wang, Duc Huy Le, Chih-Chiang Wang, and Tu N. Nguyen. "Fingerprint enhancement based on tensor of wavelet subbands for classification." IEEE Access 8 (2020): 6602-6615.

[29] Manjanaik, N., B. D. Parameshachari, S. N. Hanumanthappa, and Reshma Banu. "Intra Frame Coding In Advanced Video Coding Standard (H. 264) to Obtain Consistent PSNR and Reduce Bit Rate for Diagonal Down Left Mode Using Gaussian Pulse." In IOP Conference Series: Materials Science and Engineering, vol. 225, no. 1, p. 012209. IOP Publishing, 2017.

[30] K. Yu, M. Arifuzzaman, Z. Wen, D. Zhang and T. Sato, "A Key Management Scheme for Secure Communications of Information Centric Advanced Metering Infrastructure in Smart Grid," IEEE Transactions on Instrumentation and Measurement, vol. 64, no. 8, pp. 2072-2085, August 2015.

[31] Pham, Dung V., Giang L. Nguyen, Tu N. Nguyen, Canh V. Pham, and Anh V. Nguyen. "Multi-topic misinformation blocking with budget constraint on online social networks." IEEE Access 8 (2020): 78879-78889.

[32] Nayak, Jithendra PR, K. Anitha, B. D. Parameshachari, Reshma Banu, and P. Rashmi. "PCB Fault detection using Image processing." In IOP Conference Series: Materials Science and Engineering, vol. 225, no. 1, p. 012244. IOP Publishing, 2017.

[33] Nguyen, Tu N., Bing-Hong Liu, Nam P. Nguyen, and Jung-Te Chou. "Cyber security of smart grid: attacks and defenses." In ICC 2020-2020 IEEE International Conference on Communications (ICC), pp. 1-6. IEEE, 2020.

[34] Parameshachari, B. D., H. T. Panduranga, and Silvia liberata Ullo. "Analysis and computation of encryption technique to enhance security of medical images." In IOP Conference Series: Materials Science and Engineering, vol. 925, no. 1, p. 012028. IOP Publishing, 2020.

[35] Nguyen, Ngoc-Tu, Bing-Hong Liu, Shao-I. Chu, and Hao-Zhe Weng. "Challenges, designs, and performances of a distributed algorithm for minimum-latency of data-aggregation in multi-channel WSNs." IEEE Transactions on Network and Service Management 16, no. 1 (2018): 192-205.

[36] Shahriar, Md Rakib, SM Nahian Al Sunny, Xiaoqing Liu, Ming C. Leu, Liwen Hu, and Ngoc-Tu Nguyen. "MTComm based virtualization and integration of physical machine operations with digital-twins in cyber-physical manufacturing cloud." In 2018 5th IEEE International Conference on Cyber Security and Cloud Computing (CSCloud)/2018 4th IEEE International Conference on Edge Computing and Scalable Cloud (EdgeCom), pp. 46-51. IEEE, 2018.

[37] L. Tan, K. Yu, F. Ming, X. Cheng, G. Srivastava, "Secure and Resilient Artificial Intelligence of Things: a HoneyNet Approach for Threat Detection and Situational Awareness", IEEE Consumer Electronics Magazine, 2021, doi: 10.1109/MCE.2021.3081874.

[38] K. Yu, L. Tan, X. Shang, J. Huang, G. Srivastava and P. Chatterjee, "Efficient and Privacy-Preserving Medical Research Support Platform Against COVID-19: A Blockchain-Based Approach", IEEE Consumer Electronics Magazine, doi: 10.1109/MCE.2020.3035520.

[39] Hemalatha, K. L., SUNILKUMAR MANVI, and HN SURESH. "ADAPTIVE WEIGHTED-COVARIANCE REGULARIZED KERNEL FUZZY C MEANS ALGORITHM FOR MEDICAL

IMAGE SEGMENTATION." Journal of Theoretical & Applied Information Technology 95, no. 14 (2017).
[40] Bhuvaneswary, N., S. Prabu, S. Karthikeyan, R. Kathirvel, and T. Saraswathi. "Low Power Reversible Parallel and Serial Binary Adder/Subtractor." Further Advances in Internet of Things in Biomedical and Cyber Physical Systems (2021): 151.
[41] Bhuvaneswary, N., S. Prabu, K. Tamilselvan, and K. G. Parthiban. "Efficient Implementation of Multiply Accumulate Operation Unit Using an Interlaced Partition Multiplier." Journal of Computational and Theoretical Nanoscience 18, no. 4 (2021): 1321-1326.