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# BLOCK CHAIN TECHNOLOGY WITH QR CODE FOR MEDICAL DEVICE OWNERSHIP

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## Abstract:

Medical devices straightforwardly influence individuals' health, thus duplicating in the medical care store network should be forestalled. Fake products hurt general health and benefit from cost contrasts. A blockchain-coordinated QR code-based recognizability strategy resolves this critical issue. Our technique further develops tokenization conventions and focuses on application, security, and protection over NFT choices. QR codes recognize clinical gear effectively and inexpensively, empowering consistent combination into current work processes. Decentralized blockchain capacity confirms medical devices without outside applications. Blockchain's appropriated record design, safeguarded by complex cryptography, shields medical device information from control. Decentralized arrangements help trust and security by further developing information protection. Our innovation lets end-clients verify gadget proprietorship, advancing store network receptiveness and obligation. Our total fake medical device avoidance technique utilizes QR innovation, blockchain, and decentralized stages to safeguard general health and medical services framework certainty.

*Keywords—Secure Medical Device Information, QR Code Generation, Blockchain Technology, Authenticity, Verification, Medical device purchase.*

## 1. INTRODUCTION

The medical services business is creating because of innovation propels that have worked on understanding consideration and results. These advancements incorporate QR code innovation, which further develops information organization and correspondence [1]. QR codes utilize two-layered standardized identifications that cell phones other QR checking gadgets might sweep to rapidly acquire encoded information [2]. Cell phones have made QR codes normal in a few enterprises, including medical care [3]. This presentation features QR code innovation's part in battling fake medical devices, customary following methods' disadvantages, and medical device quality and security. It likewise analyzes how blockchain innovation could further develop medical devices security and recognizability, laying the ground for the proposed drive.[31]

QR codes have changed medical services by making data access and trade simple [4]. Rather than scanner tags, QR codes might hold URLs, contact data, and item data [5]. This flexibility makes QR codes helpful in quiet distinguishing proof, drug the board, and medical device following [6]. Simple use and

openness are QR code innovation's principal benefits. Cell phones with QR code examining capacities make it simple for medical services experts and patients to get indispensable data [7]. QR codes have worked on quiet commitment and strengthening by giving admittance to instructive assets and educational materials, empowering patients to pursue informed health choices [9]. QR code innovation has additionally permitted novel medical services arrangements like fake clinical contraptions [10]. Patient security is compromised by fake gadgets, which might be bad quality or incorporate perilous fixings [11].

Following and check strategies should be upgraded when medical device quality and health are examined [12]. Customary manual record-keeping and paper documentation are arduous, blunder inclined, and murky [13]. Clinical gear possession and upkeep history are challenging to follow with these old frameworks, leaving medical care establishments defenseless to fake or sub-par things [14]. Customary following methods are dependent upon misrepresentation and control, debilitating inventory network respectability and medical care framework certainty [15]. Creative arrangements are expected to get and follow medical devices for patient health and medical services quality [16].

Blockchain innovation might further develop medical services following [17]. Decentralized and unchangeable blockchain tracks exchanges safely [18]. It was made for digital currencies like Bitcoin. Blockchain safeguards information utilizing cryptography and agreement components [19]. Blockchain permits medical care associations to follow and confirm medical device provenance [20]. Blockchain encodes touchy information and gives adaptable access limitations so it is secure and private [21]. Blockchain networks defend patient

information against hacking and information penetrates that happen in unified data sets [22]. Blockchain additionally works on tolerant consideration by permitting medical care partner information trade and interoperability [23].

QR code innovation and blockchain give exceptional answers for fake clinical gear and clinical item quality and security [24]. Medical services associations might further develop clinical gear security, discernibility, and legitimacy by utilizing QR codes and blockchain [25]. Further interest in these advances and partner support are expected to augment patient health and medical services quality [26].

## 2. LITERATURE SURVEY

Late consideration has zeroed in on medical care, production network the board, and new advances like blockchain and QR codes. This writing overview surveys applicable examination and studies to assist us with understanding the difficulties and chances of fighting fake medical devices and further developing medical care production network detectability and security.[33]

Secure user verification frameworks for remote medical services sensor networks have been seriously concentrated because of patient information's significance. A solid remote medical care sensor network user validation strategy was recommended by Liu and Chung [1]. Their answer dealt with validation and key understanding hardships while being proficient and secure. Remote medical care information is shielded from unlawful access and information breaks utilizing validation instruments.

Drug supply networks need recognizability answers for guarantee item realness and health. Silva and

Matos [2] analyzed how medicine recognizability frameworks make esteem in drug supply chains. Discernibility frameworks need administrative consistence, information consistency, and partner interest, as indicated by their exploration. Drug organizations might increment inventory network straightforwardness, fake medicine hazard, and patient security by tending to these worries.

Blockchain innovation is promising for production network the board and different purposes past digital currencies. Chhane [3] researched blockchain-based savvy rubbish the executives. Squander the board turned out to be more straightforward, discernible, and responsible utilizing blockchain's decentralized and changeless record. Comparative blockchain executions in e-squander the board [4] underscore savvy agreements' part in further developing tasks and forestalling misrepresentation.

Blockchain innovation joined with IoT frameworks permits secure and effective information transmission in various fields. Then et al. [5] presented a brokerless, microservice-based secure IoT stage engineering for versatility and heartiness. The stage tended to IoT information transmission security issues, particularly in medical services applications where patient protection and information assurance are urgent, by utilizing blockchain for information confirmation and uprightness check.

An exhaustive writing investigation of blockchain-based applications by Casinno et al. [6] uncovered the field's state, arrangement, and unsettled concerns. Their examination found blockchain applications in medical services, store network the executives, banking, and government. Blockchain can further develop straightforwardness, security, and productivity in corporate tasks, as per the report.

In touchy fields like medical care and energy the board, protection is significant in developing innovation acknowledgment. Rotondi [7] recommended a protection well disposed game system for shrewd power and water organizations, focusing on information trade and examination security. Rotondi addressed information security and user obscurity issues by including protection upgrading systems into the structure, empowering savvy network sending.[35]

Inventive energy the executives programs need local area and user investment. Fereira and Martins [8] inspected open market energy stage user local area development. User driven plan, local area association, and schooling advance energy market trust and interest, as indicated by their review. Energy stages might engage users and advance practical energy by remembering users for navigation and cultivating transparency.

The writing audit shows how blockchain, QR codes, and IoT are utilized in medical care supply chains and neighboring fields. These advancements target fake clinical gear, production network straightforwardness, and information security to work on persistent health, effectiveness, and medical services conveyance and the executives development. Understanding these innovations' maximum capacity and tackling medical services production network troubles requires further review and joint effort.

### 3. METHODOLOGY

#### a) Proposed Work:

QR has opened up a few specialized potential outcomes that let individuals to quickly and definitively access, recover, and see information



from anyplace. QR code innovation makes getting to sites and applications fun.

Given the broad utilization of cell phones, QR code innovation makes it simple to associate, interface, and offer data.

It's likewise a protected method for sending information in light of the fact that an unapproved party can't secure it without right programming. QR codes and blockchain advancements would increment security.[37]

This total technique joins QR code straightforwardness with blockchain security and straightforwardness. This framework further develops medical device recognizability and confirmation by enabling end-users, further developing security, and settling protection issues related with brought together capacity.

Medical device information is changeless and alter safe utilizing a decentralized blockchain framework. Decreased dependence on incorporated data sets lessens duplicating and addresses security issues.

**b) System Architecture:**

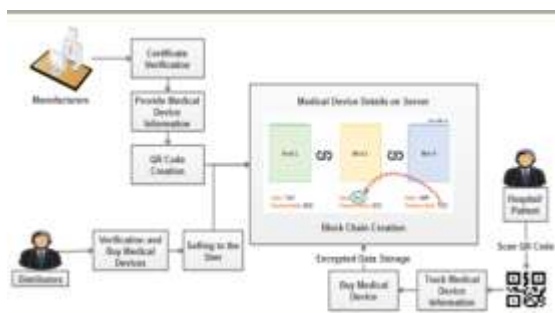


Fig1 Proposed Architecture

Different parts in the proposed system architecture empower protected and productive medical device verification and access. Endorsements from makers are held safely on servers to guarantee legitimacy. Every clinical hardware has a special QR code.

Examine the QR code to get to scrambled medical device information on the server. The client sees this unscrambled information. Information capacity is scrambled for protection. Hospitals and patients might purchase medical devices securely. QR codes let hospitals actually look at gadget legitimacy and get gadget data for procurement. Straightforwardness and genuine hospitals contraptions help patients. The plan focuses on information security and validness while empowering medical device verification, access, and buy.

**c) Admin Login:**

This module gives overseers selective backend access for client organization, item information, and framework designs through a modern login framework. Its security components limit managerial capabilities to approved clients, guaranteeing framework trustworthiness and privacy.

**d) Add Product Details**

Incorporate Item Data Executives and item supervisors utilize this module to information and update Medical device information. Details, chronic numbers, make dates, and different information are constrained by the framework. A remarkable QR code helps screen and deal with every contraption all through its presence. This worked on strategy further develops clinical hardware stock association and responsibility.

**e) View Product Details**

This module lets overseers and approved clients inspect broad Medical device information. This element is fundamental for gadget confirmation and specs. Clients might confirm quality and administrative consistence and trust the biological

system's clinical contraptions by giving definite data.

#### **f) View Users**

Overseers might analyze and oversee framework client information with this module. Heads can oversee client records, jobs, and activities. Directors may handily control client undertakings with this usefulness, keeping up with framework security. Directors might advance fruitful client the board by figuring out client jobs and activities.

#### **g) New User sign up**

This module permits clients to make accounts by giving their own data and framework qualifications. Enrollment is available to medical services experts, gadget creators, and different partners. This module smoothes out account creation to further develop client onboarding and empower smooth stage commitment for every single significant partner, making serious areas of strength for a comprehensive client local area.

#### **h) User Login**

Signing in with accreditations awards framework access after enrollment. In light of job and authorizations, this module gives customized admittance to elements and information. The framework ensures protected and fitted client collaborations by matching access levels to liabilities. This strategy safeguards delicate information and further develops client experience by offering appropriate elements in light of stage liabilities.

#### **i) Retrieve Product Data**

This module allows approved clients to check QR codes for Medical device data. This element gives speedy admittance to possession and upkeep history. Clients with approval may rapidly gain applicable

data utilizing QR code innovation, supporting independent direction and gadget the executives. This capability works on working effectiveness and tracks and records gadget information.

#### **j) Authenticate Scan**

The framework affirms the output, validates the gadget, and showcases applicable data. Medical device genuineness, administrative consistence, and fake avoidance rely upon this method. The module further develops clinical gear obtainment and use reliability by easily consolidating validation and QR code filtering.

#### **k) Start Webcam**

The QR code examining capacity, potentially combined with the filtering module, allows clients to utilize their gadget's camera or webcam. Clients may handily validate clinical hardware utilizing this worked on strategy. Clients may effectively check gadget lawfulness utilizing worked in camera works, further developing security and client experience. QR code filtering is quick and simple with this association, making framework verification more effective.[39]

### **I) BLOCKCHAIN TECHNOLOGY-**

The undertaking utilizes blockchain for decentralized capacity. It safely records clinical hardware possession and upkeep to check realness. Information saved money on the blockchain is encoded and safeguarded, forestalling unlawful access.

Blockchain is a cryptographically protected disseminated record. These strategies obtain and keep up with Medical device information safely. Adding information to the blockchain makes it

almost hard to change, guaranteeing information respectability.

The undertaking utilizes blockchain to further develop tokenization conventions, making clinical hardware and their information particular tokens on the blockchain. This strategy streamlines and gets confirmation. Clients don't require other applications for confirmation on the grounds that the blockchain is independent and dependable.

Blockchain innovation makes a total review trail for every clinical gear. This way has possession changes and upkeep. This set of experiences may be utilized in questions or reviews to follow the gadget. This component urges medical services partners to be responsible, straightforward, and dependable.

#### m) GANACHE-

In an Ethereum improvement climate, Ganache stores information in blocks that bunch exchanges, reference the past block (with the exception of the beginning block), and record a timestamp.

Ganache catches exchanges in these blocks, reporting savvy contract associations and Ethereum blockchain state changes for Ethereum application improvement, testing, and troubleshooting.

Ganache allows engineers to see exchange data, contract associations, and the blockchain state at various times in put away blocks, working with application testing and check.

#### n) METAMASK-

Metamask streamlines bitcoin the executives through an Ethereum wallet and program module. Direct admittance to decentralized applications (DApps) rearranges blockchain-based application and administration collaborations.

The task depends on Metamask to get Ethereum store network exchanges. Straightforwardness is improved by showing ETH exchange costs. This straightforwardness advances precision and creates trust in monetary trades, safeguarding store network honesty.

## 4. EXPERIMENTAL RESULTS

1) Admin Login's in and add medical device, view product details, view users



Fig 2 admin login page



Fig 3 QR code page



Fig 4 QR code download page



Fig 5 details page

2) User can register, check the product via product id and bar code



Fig 6 authentication scan page



Fig 7 user signup page



Fig 8 retrieve product details page



Fig 9 details page



Fig 10 authentication scan page



Fig 11 details page



Fig 12 equipment details page

3) User testing via camera



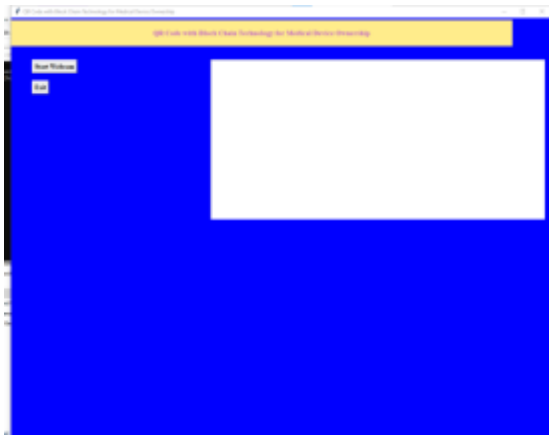


Fig 13 QR code with block chain technology for medical device ownership page

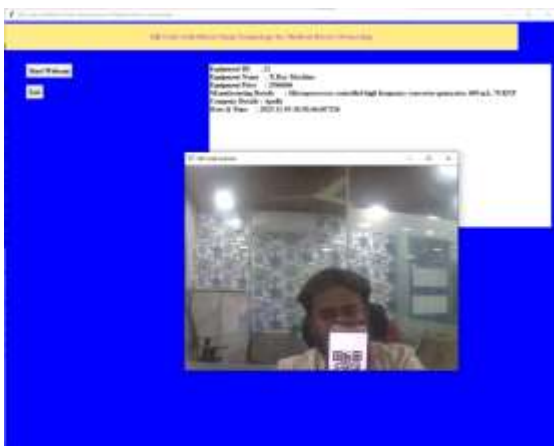


Fig 14 output page

## 5. CONCLUSION

The innovation works on purchaser check of clinical things and makers. QR codes and blockchain innovation give quick, solid assessments, supporting medical device supply chain certainty. A solid recognizability arrangement depends on the blockchain record to store gadget beginning data safely. This strategy safeguards against altering and replication dangers, further developing security and trust over concentrated frameworks.

Blockchain and QR codes might modify medical services, as shown by this spearheading exertion. It shows innovation, receptiveness, and patient security. Its decentralized engineering rouses

medical device management and different turns of events. The drive propels and advances medical services development by exhibiting these innovations' benefits.

## 6. FUTURE SCOPE

Future advancements may entail the synergistic integration of QR code and blockchain technology with other cutting-edge innovations like Internet of Things (IoT) devices and Artificial Intelligence (AI). This integration holds the potential to revolutionize real-time monitoring, data analytics, and predictive maintenance within the healthcare supply chain. By harnessing IoT devices, the system could enable comprehensive tracking of medical devices throughout their lifecycle, providing valuable insights into usage patterns and performance metrics. Moreover, AI algorithms could be employed to analyze data collected from QR codes and blockchain ledgers, facilitating predictive maintenance schedules and proactive identification of potential issues.

This convergence of technologies promises to optimize efficiency, enhance decision-making capabilities, and improve overall patient care by ensuring the availability of authentic, high-quality medical products. As these innovations continue to evolve, the healthcare industry stands poised to benefit from unprecedented levels of transparency, reliability, and innovation in supply chain management.

## REFERENCES

- [1] Liu H, YuFaang Chung, "Secure user authentication scheme for wireless healthcare sensor networks" *Comput. Electr. Eng.* Pp:6780(2017)
- [2] Silva R. B. D. and Matos C. A. D., "Critical success factors of a drug traceability system for

creating value in a pharmaceutical supply chain (PSC),” *Int. J. Environ. Res. Public Health*, vol. 16, no. 11, p. 1972, Jun. 2019.

[3] LamiChhane M., “A smart waste management system using IoT and blockchain technology,” M.S. thesis, Dept. Inf. Technol., ITMO Univ., Saint Petersburg, Russia, Pages:1-60 Published on: May 24, 2017.

[4] Gupta N. and Beddi P., “E-waste management using blockchain based smart contracts,” in *Proc. Int. Conf. Adv. Compu., Commu. Info. (ICACCI)*, pp 915-921, 2018

[5] Then, Phien, Vo, Luong, Anh, Tuan, Son. A secure IoT platform with brokerless and micro-service architecture. (IJACSA) *International Journal of Advanced Computer Science and Applications*, Vol. 12, Pp: 7-20, 2021

[6] Casinno, F.; Dasakllis, T.K.; Patsakiis, C. A systematic literature review of blockchain-based applications: Current status, classification, and open issues. *Telemat. Inform. Vol. 36*, pp 55-81. Published on: 2019.

[7] Rotondi, G. Verticale, A Privacy-Friendly Gaming Framework in Smart Electricity and Water Grids, *IEEE Access*, Vol. 5, pp. 14221-14233, July 2021.

[8] J. Ferreira, A. Martins, “Building a Community of Users for Open Market Energy”, *Energies*, Vol. 11, No. 9 Pages 41-71, Article No. 2330, September, 2018.

[9] J. Liliestam and Hangger, “Shades of green: Centralisation, decentralisation, and controversy among European renewable electricity visions,” *Energy Res. Social Sci.*, vol. 17, pp. 20–29, Jul. 2016.

[10] T. Orlandiini, T. Sores, T. Sousa, and P. Pinson, “Coordinating consumercentric market and grid operation on distribution grid,” in *Proc. 16th Int. Conf. Eur. Energy Market (EEM)*, pp. 1112–1123, Sep. 2019.

[11] Jin Wu, and Jia, “Local flexibility markets: Literature review, models and clearing methods,” vol: 8 pp. 76–90 Mar 2020.

[12] S. Saravanan, T. Abirami and P. Pandiaraja, “Improve Efficient Keywords Searching Data Retrieval Process in Cloud Server. 2018 International Conference on Intelligent Computing and Communication for Smart World (I2C2SW), Erode, India, 2018, pp. 219-223, 2018.

[13] Peddro H. PettersBarbosaEttore P. L. B. AquinoDiogoBarross Pinto Bruno Henri QuesDiass “Blockchain in Consumer-Centric Electricity Markets: An Overview” vol.87 pp. 221–235, Oct 2022.

[14] Parag, Y., Sovacool, B. K.: „Electricity market design for the prosumer era”,

[15] *Nat. Energy*, 2016 Parag, Y., Sovacool, B. K.: „Electricity market design for the prosumer era”, *Nat. Energy*, 2016.

[16] Yavas, Kim DS „Matching of buyers and sellers by brokers: a comparison of alternative commission structures”, *Real Estate Econ.*, pp. 3410–3421 (1996).

[17] AmitBhusari, RinuVishwakarma, DipaliBhusari, SnehalShinde, et. al., “GOVERNMENT FUND ALLOCATION TRACKING SYSTEM OVER BLOCKCHAIN” published in *ijstm open Access*, available at [http://www.ijstm.com/images/short\\_pdf/1696153596\\_T5084.pdf](http://www.ijstm.com/images/short_pdf/1696153596_T5084.pdf)

- [18] ApoorvaMohite; Ajay Acharya; et. al., “Blockchain for government fund tracking using Hyperledger” published in IEEE open Access, available at <https://ieeexplore.ieee.org/document/8769200>
- [19] Jay Jagtap , PradhumnaJadhav, RushikeshWanjale , Ninad Mane , Mrs.HemaKumbhar, et. al., “Government Fund Allocation Using Blockchain” published in IJCRT open Access, available at <https://www.ijcrt.org/papers/IJCRT23A5359.pdf>.
- [20] AjayvikramChauhan; GauravSavner; PrajwalVenkatesh; VishwanathPatil; Wencen Wu, et. al., “A Blockchain-Based Tracking System” published in IEEE open Access, available at <https://ieeexplore.ieee.org/abstract/document/9183541>
- [21] NinadSonawane; Pranshu Gupta; Laksh C; Gururaja H S, et. al., “Blockchain Solution for Enhancing Risk Management and Transparency in Loan Disbursements” published in iee open Access,availableat<https://ieeexplore.ieee.org/document/10392836>
- [22] Mohanta, Bhabendu Jena, Debasish and Panda, Soumyashree and Sob-hanayak, Srichandan. (2019).Blockchain Technology: A Survey on Applications and Security Privacy Challenges. 8. 100107.10.1016/j.iot.2019.10010
- [23] D. A. Wijaya, ”Extending asset management system functionality in bit- coin platform,” International Conference on Computer, Control, Informatics and its Applications (IC3INA), Tangerang, 2016,pp. 97-101, doi: 10.1109/IC3INA.2016.7863031
- [24] K. Saito and H. Yamada, ”What’s So Different about Blockchain? — Blockchainis a ProbabilisticState Machine,” 2016 IEEE 36th International Conference on Distributed Computing SystemsWorkshops (ICDCSW), Nara, 2016, pp. 168-175, doi: 10.1109/ICDCSW.2016.28.
- [25] G. Hurlburt, ”Could Blockchain Outlive Bitcoin ?,” in IT Professional, vol.18, no. 2, pages 1216,Mar.-Apr. 2016, i-doi: 10.1109 / MITP.2016.21.
- [26] Lei Xu, Nolan Shah, Lin Chen, NourDiallo, ZhiminGao, Yang Lu, and Weidong Shi. 2017.Enabling the Sharing Economy: Privacy Respecting Contract based on Public Blockchain. In Proceedings of theACM Workshop on Blockchain, Cryptocurrencies and Contracts (BCC ’17).Association forComputing Machinery, New York, NY, USA, 1521.DOI:<https://doi.org/10.1145/3055518.30555>
- 6 | P a g e
- [27] LS Sankar, M. Sindhu and M. Sethumadhavan, ”A study of compliance proceduresregardingblockchain applications,” 2017 4th International Conferenceon Advanced Computing andCommunication Systems (ICACCS), Coimbatore, 2017, pages 1- 5, doi: 10.1109 / ICACCS.2017.8014672
- [28] Tien Tuan AnhDinh, Ji Wang, Gang Chen, Rui Liu, Beng Chin Ooi, and Kian-Lee Tan. 2017.BLOCKBENCH: A Framework for Analyzing Private Blockchains. In Proceedings of the 2017ACMInternational Conference on Management of Data (SIGMOD ’17). Association forComputingMachinery, New York, NY, USA, 10851100.DOI:<https://doi.org/10.1145/3035918.3064033>
- [29] Khan, A. Lewis, E. Rutland, C. Wan, K. Rutter and C. Thompson, ”A Distributed-

Ledger Consortium Model for Collaborative Innovation,” in Computer, vol. 50, no. 9, pp. 29-37, 2017, doi:10.1109/MC.2017.3571057

[30] [1] M. Moser, R. Bohme noD. Breuker, ”An investigation into fraudulent tools in the Bitcoin ecosystem,”2013 APWG at Crime Researchers Summit, San Francisco, CA, 2013, pages 1-14,doi:10.1109 / CRS.2013.6805780

[31] G.Viswanath, “Hybrid encryption framework for securing big data storage in multi-cloud environment”, Evolutionary intelligence, vol.14, 2021, pp.691-698.

[32] Viswanath Gudditi, “Adaptive Light Weight Encryption Algorithm for Securing Multi-Cloud Storage”, Turkish Journal of Computer and Mathematics Education (TURCOMAT), vol.12, 2021, pp.545-552.

[33] Viswanath Gudditi, “A Smart Recommendation System for Medicine using Intelligent NLP Techniques”, 2022 International Conference on Automation, Computing and Renewable Systems (ICACRS), 2022, pp.1081-1084.

[34] G.Viswanath, “Enhancing power unbiased cooperative media access control protocol in manets”, International Journal of Engineering Inventions, 2014, vol.4, pp.8-12.

[35] Viswanath G, “A Hybrid Particle Swarm Optimization and C4.5 for Network Intrusion Detection and Prevention System”, 2024, International Journal of Computing, DOI: <https://doi.org/10.47839/ijc.23.1.3442>, vol.23, 2024, pp.109-115.

[36] G.Viswanath, “A Real Time online Food Ordering application based DJANGO Restfull Framework”, Juni Khyat, vol.13, 2023, pp.154-162.

[37]Gudditi Viswanath, “Distributed Utility-Based Energy Efficient Cooperative Medium Access Control in MANETS”, 2014, International Journal of Engineering Inventions, vol.4, pp.08-12.

[38] G.Viswanath,“ A Real-Time Video Based Vehicle Classification, Detection And Counting System”, 2023, Industrial Engineering Journal, vol.52, pp.474-480.

[39] G.Viswanath, “A Real- Time Case Scenario Based On Url Phishing Detection Through Login Urls ”, 2023, Material Science Technology, vol.22, pp.103-108.

[40]Manmohan Singh,Susheel Kumar Tiwari, G. Swapna, Kirti Verma, Vikas Prasad, Vinod Patidar, Dharmendra Sharma and Hemant Mewada, “A Drug-Target Interaction Prediction Based on Supervised Probabilistic Classification” published in Journal of Computer Science, Available at: <https://pdfs.semanticscholar.org/69ac/f07f2e756b79181e4f1e75f9e0f275a56b8e.pdf>