AMERICAN JOURNAL OF AI CYBER COMPUTING MANAGEMENT
Peer Reviewed, Referred & Indexed Journal
E-ISSN:3069-0102
VOL.6, NO. 2(1) (2026)

Digi Kisan: A Web-Based Agricultural E-Auction Platform for Transparent Crop Trading

[1] R. Krishna Naik , [2]Ali Soujanya, [3]Christina Joseph, [4]Tejaswi Reddy Karna, [5]Madakam Divya

[1] Asst.Professor, [(2, 3, 4, 5)] B. Tech 4th year IT Students

Vignan Institute of Management and Technology for Women Hyderabad, India

[1]ram123@gmail.com, [2]soujanyamudiraj528@gmail.com, [3]christinajoseph26th@gmail.com, [4]tejaswireddykarna@gmail.com, [5]madakamdivya2@gmail.com

Abstract

Agriculture is vital to the livelihoods of millions of people, especially in developing countries. However, traditional agricultural marketing often relies on middlemen, which lowers profits for farmers and makes pricing unclear. Farmers often struggle to find fair buyers and obtain competitive prices for their crops. To tackle these problems, this paper introduces DigiKisan, a web-based agricultural e-auction platform that directly connects farmers and buyers through an online bidding system. The system is built using the Flask web framework, Python for the backend, and SQLite as the database. The user interface is created with HTML, CSS, and JavaScript to ensure an interactive web experience. DigiKisan has three types of users: administrators, farmers, and buyers. Farmers can list crops for auction, buyers can submit competitive bids in real time, and administrators can oversee and manage the system. The platform automatically checks bids and closes auctions based on time limits while generating digital contracts for completed transactions. DigiKisan enhances market transparency, removes middlemen, and allows secure crop trading using digital technology. This system shows how web applications can modernize agricultural markets and help farmers achieve fair market prices.

Keywords: Agricultural marketplace, online auction system, web application, digital agriculture, smart farming.

1. Introduction

Agriculture is important for food security as well as the economic sustainability of many people. Agriculture is the principal means of providing income for a substantial percentage of the developing world's population; therefore agriculture is essential to economic development. Traditional agricultural marketing systems use the same method of trade; farmers have to sell their crops to a middleman who controls the price and accessibility to a market for their crops. The dependence on a middleman decreases profitability for farmers when selling their products; moreover, it limits the number of potential buyers.

Advances in fast digital technology have led to the development of web-based platforms that enhance transparency and efficiency for buyers and sellers in commercial transactions. Web-

based marketplaces match buyers and sellers without the use of a middleman to facilitate the transaction thereby creating a fair playing field. An auction-based marketplace will provide competitive bidding by all buyers on all products as a means of enhancing price-discovery for all buyers.

DigiKisan is an e-auction platform specifically for agriculture focused on helping to facilitate direct communication between farmers and buyers. Farmers can upload their crop information and begin the auction process while buyers place bids in real time for the crops they want. All bids submitted on DigiKisan will be verified before they become binding on either party through a verification process; once the auction time limit specified is reached, an automated process will be used to complete the auction. DigiKisan, by developing a transparent digital market place, can provide better access to local and international markets for farmers and the potential to improve farmers' profitability.

2. Literature Survey

Numerous researchers have studied the use of digital technology in the marketing of agriculture. These studies have shown that online purchasing, online trading, and online marketplaces, improve the transparency, ease of access and speed of crop transactions.

Researchers (Makka et al.) proposed an agricultural auction system utilizing blockchain, in which automated smart contracts could facilitate the bidding process through the use of secure methods to ensure that stored data remains unchanged. Although this system provides secure methods to ensure that stored data is not changed (due to its use of smart contract technology), the complexity of implementation and the need for a well-established infrastructure to support this type of system will likely hinder its practical use.

One research project discussed an online auction platform for the purposes of online sales. This system allowed buyers to bid competitively, and to have a transparent process for determining prices. However, while it was an excellent system for the purchase of items found in traditional e-commerce applications, it did not discuss specific issues related to the buying and selling of agricultural products.

Other research projects have discussed the development of website portals to serve as a connection between producers and consumers. These website portals reduce the need for intermediaries, allowing producers to access larger markets. However, the majority of existing website portals do not contain features such as built-in auction platforms or the ability to generate secure digital contracts.

DigiKisan is a digital agriculture platform that was developed in connection with these studies, providing simple web-based solutions to support the use of online auctions, through the use of a comprehensive role-based access control and digital contract management system in support of the efficient use of agriculture.

3. Proposed System

DigiKisan is an online agricultural marketplace designed to provide farmers with a platform for selling their crops via a web-based online auction. The new system will supply farmer crops with transparency and improved efficiency by creating a direct interaction between farmers and buyers.

The system has three types of users.

Administrator:

The administrator will manage the system by monitoring users and their activity, crop data management, and ensuring the seamless operation of all auctions.

Farmer:

The farmer will register on the platform, create listing for his/her crops (provide details such as the crop name, short description of the crop, starting price and auction duration).

Buyer:

The buyer will be able to review active auctions and place bids on the crops listed. Every time a buyer bids on a crop, the system will check that their bid has been entered correctly and that the highest bid is updated accordingly.

When the auction period has ended the system will automatically end the auction period, identify which buyer has placed the highest bid, and create a digital document to transfer the ownership of the crop to the buyer via a binding contract.

4. System Architecture

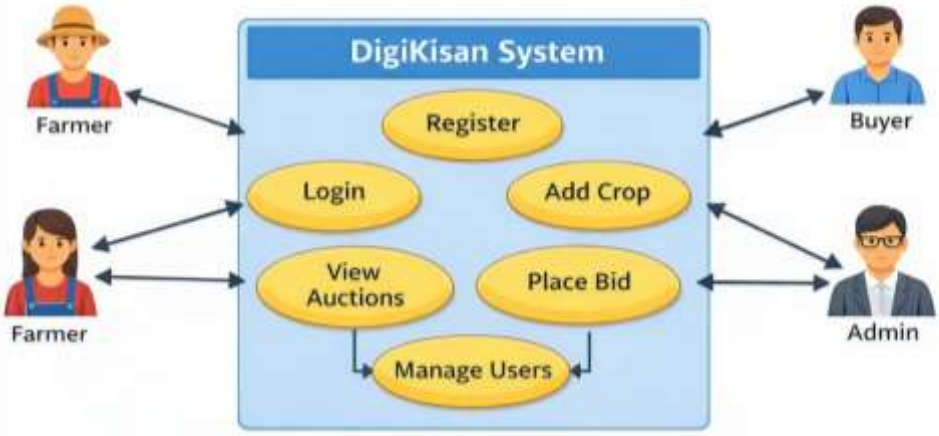


Fig. 1 Use Case Diagram of DigiKisan System

The DigiKisan system has been built with a three-tiered web based architecture consisting of a Presentation Layer, an Application Layer, and a DataBase Layer.

Fig.1 Use Case Diagram of DigiKisan System

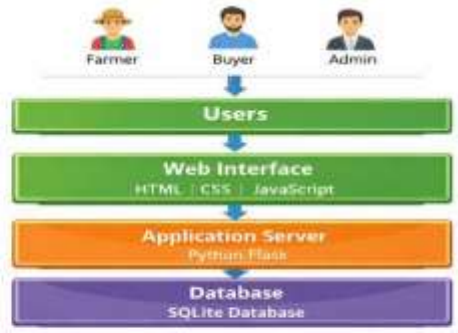


Fig.2 System Architecture of DigiKisan Platform

Fig.3 Workflow Diagram of DigiKisan System

Fig.4 Database Design of DigiKisan Platform

Presentation Layer :

The presentation layer is responsible for how users interact with the DigiKisan platform and therefore provides the graphical user interface through which the user will access the DigiKisan system. This layer is developed using HTML, CSS and JavaScript.

Application Layer :

The Application Layer makes use of Flask as a back-end framework within which applications can be created using the Python Programming Language. The Application Layer has been developed to handle various aspects of the application functionality including business logic, registration of users, authentication of users, auction management, validation of bids placed by users.

Database Layer :

The Database Layer will house all of the data associated with the DigiKisan system. The database will be constructed using SQLite and will store all relevant data associated with DigiKisan and its user including users, crops, bids and contracts between buyers and sellers.

Create an architecture diagram (Figure No. 1 – System Architecture)

An architecture diagram in colour must be created from top to bottom showing the following:

Browser → Flask (Server) → SQLite

Database Boxes will be labelled as follows:

- Browser Interface (HTML/CSS/JS)
- Flask Back End (Python Programming Language)
- SQLite (Database)

5. Algorithm

Auction Bidding Procedure

Step 1. A user logs in to the web application.

Step 2. Grower enters their crops into the system and creates the auction.

Step 3. Timer for the auction is set.

Step 4. The buyer can see the auction currently running in the system.

Step 5. The buyer places their bid.

Step 6. System will check that the bid placed is greater than the current highest bid.

Step 7. If the bid is valid, the database will update the highest bids.

Step 8. If the timer reaches zero, the auction ends automatically.

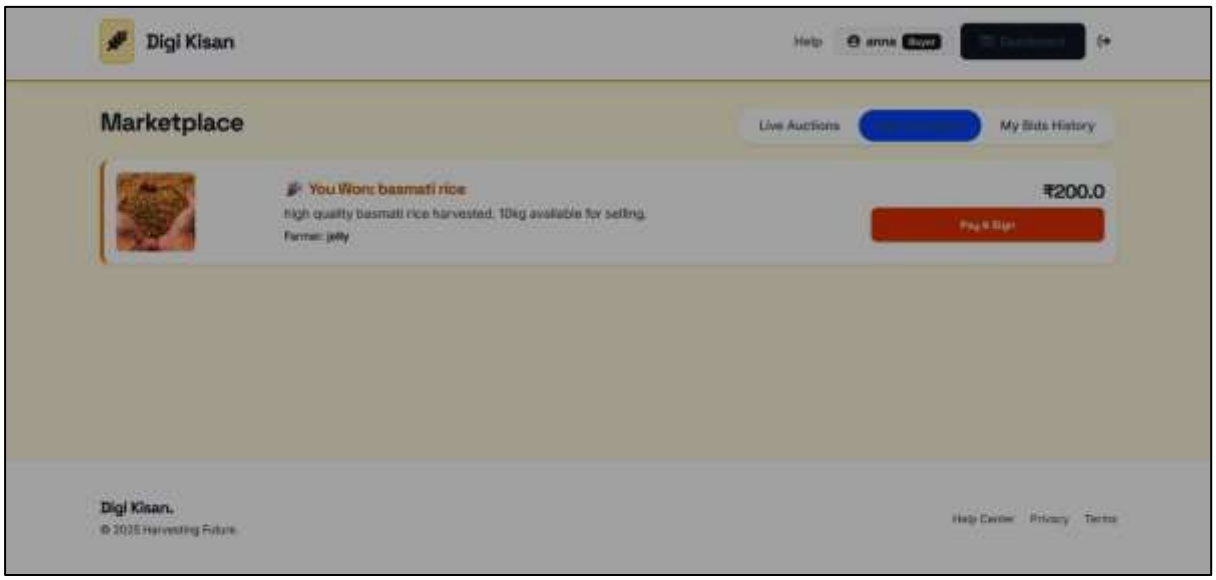
Step 9. The buyer with the highest bid will be notified and the auction winner will be declared.

Step 10. The digital contract will be created.

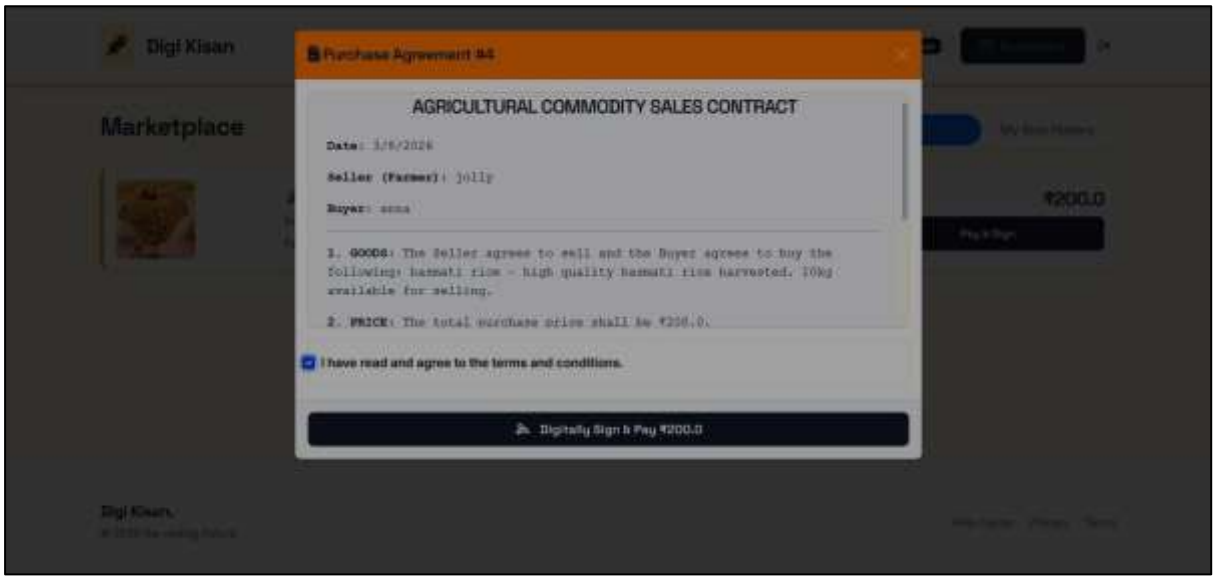
6. Results

The DigiKisan system is functional and has been tested in the web environment. Users can securely log in to the platform, list their crops for sale, bid on crops and generate digital contracts when transactions are complete.

The user interface has two dashboards (Farmers and Buyers). Farmers can add their crop details easily and check on their auction status, while buyers can easily participate in the bidding process by employing a simple and user-friendly interface.

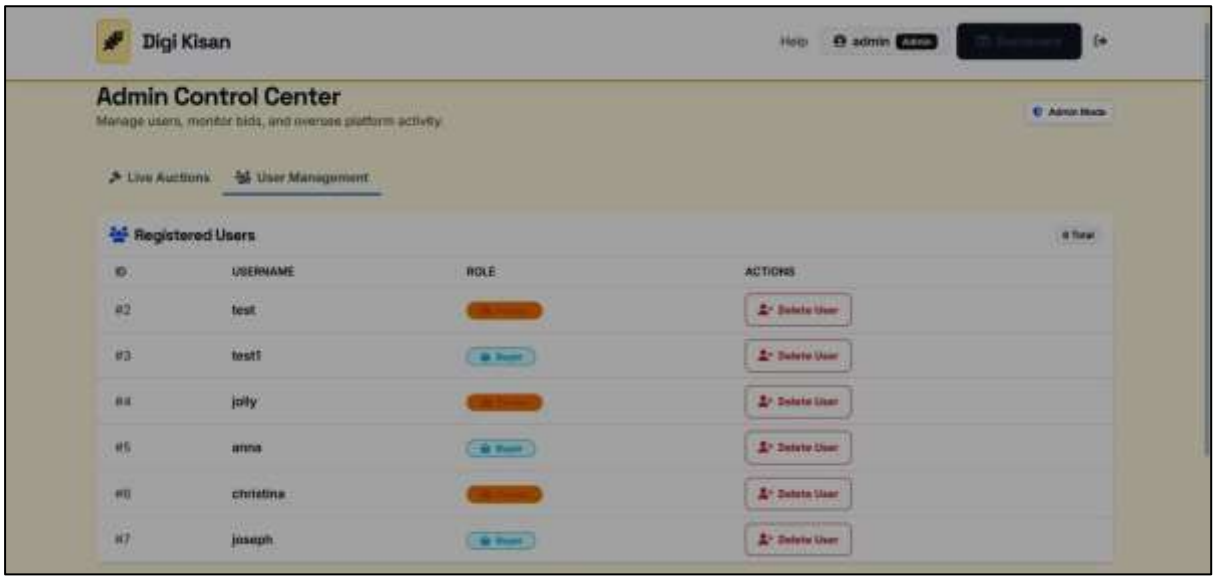


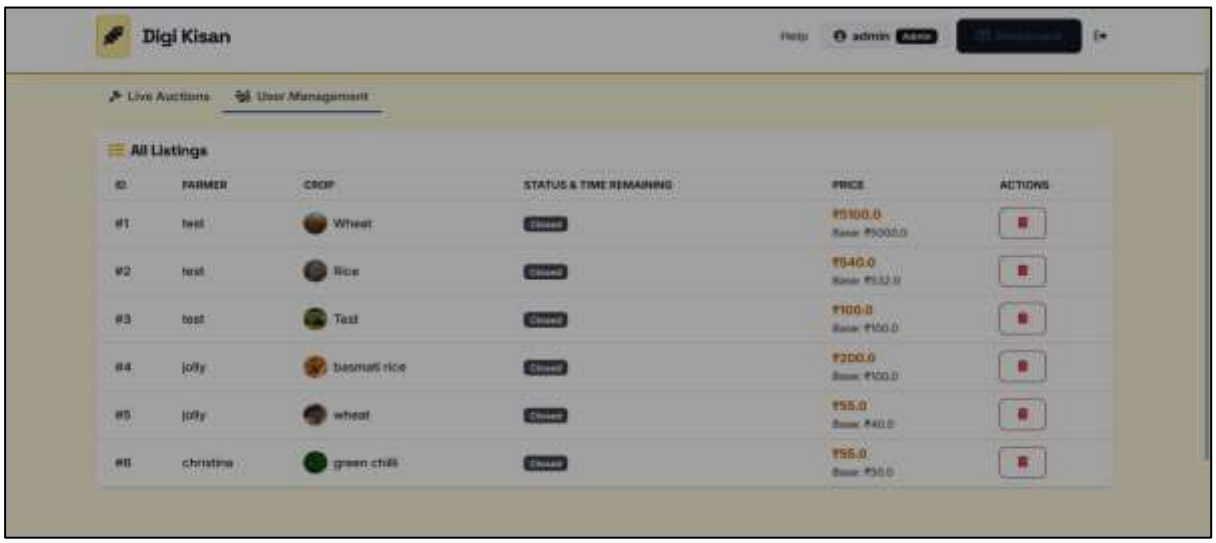

Digi Kisan
Help
anna Buyer
Marketplace
Live Auctions
My Purchases
Bid Log
DATE
CROP NAME
MY BID
CURRENT HIGHEST
STATUS
wheat
₹45.0
₹55.0
basmati rice
₹200.0
₹200.0
Won
Digi Kisan.
Help Center
Privacy
Terms


Digi Kisan
Purchase Agreement #4
AGRICULTURAL COMMODITY SALES CONTRACT
Date: 3/6/2026
Seller (Farmer): jolly
Buyer: anna
1. GOODS: The Seller agrees to sell and the Buyer agrees to buy the following: basmati rice - high quality basmati rice harvested. 10kg available for selling.
2. PRICE: The total purchase price shall be ₹200.0.
I have read and agree to the terms and conditions.
Digitally Sign & Pay ₹200.0
Marketplace
₹200.0
Digi Kisan.


for selling.
3. CONSIDERATION
The Buyer agrees to accept the goods and pay the total sum of ₹200.0.
4. TERMS
This contract was executed digitally via the Digi Kisan Platform. Payment has been secured and held in escrow until delivery is verified.
jolly
SELLER SIGNATURE
(Digitally Verified)
anna
BUYER SIGNATURE
(Digitally Verified)


Back to Dashboard
Print / Save as PDF
AGRICULTURAL COMMODITY SALES AGREEMENT
Contract ID: DIGI-000003
1. PARTIES
This Agreement is entered into between:
SELLER (Farmer): jolly
BUYER: anna
2. THE GOODS
The Seller agrees to transfer and deliver to the Buyer, the following goods:


Digi Kisan
admin
Admin Control Center
Manage users, monitor bids, and oversee platform activity.
Live Auctions
User Management
Registered Users
ID
USERNAME
ROLE
ACTIONS
#2 test
#3 test1
#4 jolly
#5 anna
#6 christina
#7 joseph


Digi Kisan
admin
Live Auctions
User Management
All Listings
ID
FARMER
CROP
STATUS & TIME REMAINING
PRICE
ACTIONS
#1 test Wheat
#2 test Rice
#3 test Test
#4 jolly basmati rice
#5 jolly wheat
#6 christina green chilli

7. Conclusion

DigiKisan, an online e-Auction for agriculture, was developed to bring transparency and efficiency to the agricultural trade. DigiKisan enables farmers to showcase their products via an online auction process, allowing buyers to place bids on agricultural products. By eliminating middlemen, and allowing farmers and buyers to communicate directly via the platform, DigiKisan provides for better price transparency and allows farmers to receive a better market value for their crops. The DigiKisan platform is designed to incorporate role-based authentication, auction management, bid validation, and digital contract generation to create a secure and reliable transaction process. The DigiKisan platform illustrates how digital web technologies can be applied to create a more efficient and effective way of doing business in the agricultural marketplace, by digitally transforming the traditional methods of trading within agriculture into digital marketplace systems.

8. Future Scope

The future potential of the DigiKisan platform includes the addition of further functionality to enhance it for ease of use, as well as scalability. Potential future improvements include adding online payment gateways, real-time notifications, and mobile application support. Enhancements like these will provide farmers with advanced analytics and machine learning models that would help them to predict crop prices and have access to improved market insights.

9. References

[1] V. V. Mandhare, G. A. Patil and P. S. Vikhe, "Design and Implementation of Online Auction System," *International Journal of Computer Applications*, vol. 182, no. 44, pp. 15-21, 2024.

[2] S. Makka, S. B. Reddy and K. S. Rautela, "E-Auction System of Agricultural Products Using Blockchain Technology," *Proceedings of the International Conference on Electronics and Communication Engineering*, pp. 120-126, 2023.

[3] X. Yang, J. Wang and H. Zhang, "A Survey on Smart Agriculture: Development Modes and Technologies," *IEEE/CAA Journal of Automatica Sinica*, vol. 8, no. 3, pp. 457-473, 2022.

[4] S. Vasudev, "Green Auction – A Farmer Friendly Android Application," *International Journal of Engineering Research and Technology (IJERT)*, vol. 9, no. 6, pp. 210-214, 2021.

[5] I. Hossain, M. Rahman and S. Ahmed, "Farmer's Market: An Online Market for Farmers and Traders," *International Journal of Computer Science and Information Technology*, vol. 12, no. 4, pp. 65-72, 2022.

[6] L. Liu, "Research on Agricultural Products E-Commerce Platform Based on Cloud Computing," *Journal of Agricultural Informatics*, vol. 15, no. 2, pp. 45-51, 2023.

[7] A. Gupta and N. Sharma, "AI-Based Crop Trading and Market Prediction System," *International Journal of Advanced Computer Science and Applications*, vol. 14, no. 3, pp. 120-128, 2024.

[8] R. Singh, P. Patel and V. Kumar, "Digital Marketplace for Agricultural Products Using Web Technologies," *International Journal of Agricultural Informatics*, vol. 11, no. 1, pp. 35-42, 2023.

[9] M. Kumar and S. Verma, "Smart Agriculture Using Internet of Things and Data Analytics," *International Journal of Computer Engineering and Technology*, vol. 13, no. 5, pp. 88-95, 2022.

[10] D Shanthi, "Smart Water Bottle With Smart Technology", Handbook Of Artificial Intelligence, Benthem Science Publishers, Pg. No: 204-219, 2023.

[11] P. K. Bolisetty And Midhunchakkaravarthy, "Comparative Analysis Of Software Reliability Prediction And Optimization Using Machine Learning Algorithms," 2025 International Conference On Intelligent Systems And Computational Networks (ICISCN), Bidar, India, 2025, Pp. 1-4, Doi: 10.1109/ICISCN64258.2025.10934209.

[12] Shanthi, Dr. D., G. Ashok, Chitrika Biswal, Sangem Udharika, Sri Varshini, and Gopireddi Sindhu. 2025. "Ai-Driven Adaptive It Training: A Personalized Learning Framework For Enhanced Knowledge Retention And Engagement". Metallurgical and Materials Engineering, May, 136-45. https://metall-mater-eng.com/index.php/home/article/view/1567.

[13] Shanthi, D., Aryan, S. R., Harshitha, K., & Malgireddy, S. (2023, December). Smart Helmet. In International Conference on Advances in Computational Intelligence (pp. 1-17). Cham: Springer Nature Switzerland.

[14] Shanthi, D., G. Narsimha, and R.K. Mohanthy. 2015. Human Intelligence vs. Artificial Intelligence. International Journal of Electronics Communication and Computer Engineering 6 (5): 30–34.

[15] D. Shanthi, Narla Swapna, Ajmeera Kiran, and Shaga Anoosha, Ensemble approach of GP, ACOT, PSO, and SNN for predicting software reliability, International Journal of Engineering Systems Modelling and SimulationVol. 15, No. 2, March 1, 2024pp 68-75.

[16] D. Shanthi, R. K. Mohanty, G. Narsimha and V. Aruna, "Application of partical swarm intelligence technique to predict software reliability," 2017 International Conference on Intelligent Computing and Control Systems (ICICCS), Madurai, India, 2017, pp. 629-635, doi: 10.1109/ICCONS.2017.8250539.

[17] D. Shanthi, P. Kuncha, M. S. M. Dhar, A. Jamshed, H. Pallathadka and A. L. K. J E, "The Blue Brain Technology using Machine Learning," 2021 6th International Conference on Communication and Electronics Systems (ICCES), Coimbatre, India, 2021, pp. 1370-1375, doi: 10.1109/ICCES51350.2021.9489075.

[18] Shanthi, D., C. H. Sankeerthana, and R. Usha Rani. "Spiking Neural Networks for Predicting Software Reliability." ICICNIS. 2020. 179-185.

[19] D. Shanthi, R. K. Mohanty and G. Narsimha, "Application of Machine Learning Techniques for Stastical Analysis of Software Reliability Data Sets," 2018 Second International Conference on Intelligent Computing and Control Systems (ICICCS), Madurai, India, 2018, pp. 1472-1474, doi: 10.1109/ICCONS.2018.8663005.

[20] P. Endla, A. R, S. Suneel, A. P. Singh, P. A and D.Shanthi, "MedSensePathway: A Hybrid Framework for Real-Time Diagnosis of Malarial Parasites using Medical Imaging," 2025 9th International Conference on Electronics, Communication and Aerospace Technology (ICECA), Coimbatore, India, 2025, pp. 1972-1978, doi: 10.1109/ICECA66444.2025.11382939.

[21] Shanthi, D. (2022). Smart Healthcare for Pregnant Women in Rural Areas. In Medical Imaging and Health Informatics (eds T.H. Jaware, K. Sarat Kumar, R.D. Badgujar and S.

Antonov). https://doi.org/10.1002/9781119819165.ch17

[22] N. Gupta and S. Jain, "Digital Agriculture Platforms for Farmers," *International Journal of Agricultural Science and Technology*, vol. 12, no. 1, pp. 25-33, 2023.

[23] M. Ahmed and R. Khan, "Secure Web Applications for Online Marketplaces," *International Journal of Computer Networks and Applications*, vol. 10, no. 4, pp. 155-162, 2022.

[24] D. Lee and J. Park, "Data-Driven Agricultural Trading Platforms," *Journal of Information Systems and Technology*, vol. 16, no. 3, pp. 210-218, 2023.

[25] P. Verma and A. Mishra, "Modern Agricultural Marketing Using Digital Platforms," *International Journal of Agricultural Economics and Management*, vol. 9, no. 2, pp. 100-108, 2024.

[26] Todupunuri, A. (2025). IMPROVING CUSTOMER EXPERIENCE WITH MODERN BANKING SOLUTIONS. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.5120615

[27] Babburi, S. (2024). Explainable AI Framework for Policy-Compliant Anomaly Detection in Data Pipelines.

[28] Gaddam, S. Integrating Analytics into the Development Process: Bridging the Gap between Data Insights and Design Execution.

[29] Reddy, S. K. R. Developing a Modular AI Framework to Enhance Scalability and Personalization in Next-Generation Reward Platforms.

[30] Poojari, R. INTELLIGENT SYSTEMS+B108 AND APPLICATIONS IN ENGINEERING.

[31] Vasagam, M. (2024, August 30). Ensuring security in modern data pipelines: Practical strategies for data engineers. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 2401.

[32] Santthosh Saai Reddy Purmani. (2026). Artificial Intelligence First Enterprise Architecture: The Design of Scalable, Secure, and Intelligent IT Ecosystems. American Journal of AI Cyber Computing Management, 6(1(2)), 1–8. https://doi.org/10.64751/ajaccm.2026.v6.n1(2).pp1-8

[33] Cyril, H. P., & Kumara, S. (2026, February). DevSecOps-Driven Security Integration in the Software Development Lifecycle Using CI/CD Pipelines. In 2026 IEEE 5th International Conference on AI in Cybersecurity (ICAIC) (pp. 1-6). IEEE.

[34] Kotte, G. (2025). Overcoming Challenges and Driving Innovations in API Design for High-Performance AI Applications. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.5283649

[35] Mahtabi, M., Roshan, M., Muhit, M. M. I., Behvar, A., & Haghshenas, M. (2026). Cryogenic ultrasonic fatigue: Mechanisms, advancements, and insights. Cryogenics, 153, 104257. https://doi.org/10.1016/j.cryogenics.2025.104257

[36] Viswanathan, V. (2024). Pioneering Ethical AI Integration in Enterprise Workflows: A Framework for Scalable Team Governance. Available at SSRN 5375619.

[37] Akhilaiswarya, B., Sree, B. T., Lilly, K., Chowdary, K. H., & Sruthi, M. (2023). Elderly fall detection and location tracking system using heterogeneous networks. Journal of Engineering Sciences, 14(05).

[38] Viswanathan, V. (2025). Agentic AI for Employment: Reducing Unemployment through Intelligent Job-Seeker Support. LEX LOCALIS–Journal of Local Self-Government.

[39] Mudusu, S. K. (2026, February 9). AI-augmented data quality engineering. InfoWorld (Foundry Expert Contributor Network).

[40] Viswanathan, V., Shah, A. K., Kubam, C. S., Dontu, S., Gandhi, A., & Singla, P. (2025, August). Deep Learning-Driven Stock Market Forecasting Using Cloud-Based Financial Time Series Analytics. In 2025 International Conference on Emerging Trends in Networks and Computer Communications (ETNCC) (pp. 1-6). IEEE.

[41] Sruthi, M. V., Soundararajan, K., & Sree, V. U. (2012). Accurate Multimodality Registration of medical images. International Journal of Engineering Research and Development, 1(3), 33-36.

[42] Viswanathan, V., Polagani, S. S., Agarwal, R., Akula, S., Dey, S., & Kashyap, R. (2025, September). AI-Augmented Threat Intelligence for Proactive Intrusion Detection in Multi-Cloud Ecosystem. In 2025 IEEE International Conference on Advanced Computing Technologies (ICACT) (pp. 567-572). IEEE.

[43] Mudusu, S. K., & Gentyala, S. (2026). Zero-Trust Data Pipelines for AI Systems: A Framework for Secure, Verifiable, and Auditable Data Engineering. JOURNAL OF RECENT TRENDS IN COMPUTER SCIENCE AND ENGINEERING (JRTCSE), 14(2), 10-25.

[44] DEVARASETTY, N. (2023). SCALABLE DATA ENGINEERING APPROACHES FOR AI-DRIVEN INDUSTRIAL IOT APPLICATIONS. INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH AND MANAGEMENT, 11(06), 954-968.

[45] Agrawal, A. M., Gajula, S., Shinde, R. P., Shah, H., & Ghosh, H. (2025, July). Machine Translation for Long Sequences with Enhanced Attention Mechanisms. In 2025 5th International Conference on Electrical, Computer and Energy Technologies (ICECET) (pp. 1-6). IEEE.

[46] Dayal, P. S., Chandra, B. R., Keerthi, M., Sruthi, M., Venkatesh, K., Appalaraju, G., & Eswari, G. (2013). Design of Pyramidal Horn Antenna at 10GHz Using WIPL-D Optimizer. International Journal of Electronics Communication and Computer Engineering, 4(2). Maturi, S. Y. (2023). Crowdsourced frontier: Unveiling autonomous adversarial cybercapabilities via open AI competition. International Journal of Intelligent Systems and Applications in Engineering, 11(1s), 275–284.

[47] Hassan, T., Karim, M. F., Jeelani, H., Behnam, E., Green, R., & Syed, F. J. (2025). Optimizing Medical Question-Answering Systems: A Comparative Study of Fine-Tuned and Zero-Shot Large Language Models with RAG Framework. arXiv preprint arXiv:2512.05863.

[48] Manoharan, D. (2026). Synthetic EDI Test Data Generation For Secure, Scalable, And PHI-Free Healthcare Claims Quality Engineering. Journal of International Crisis and Risk Communication Research, 9(1).

[49] Ravishankara, M. (2026, February). CircuChain: Disentangling Competence and Compliance in LLM Circuit Analysis. In SoutheastCon 2026 (pp. 1-7). IEEE.

[50] Sruthi, M. V., Sree, V. U., & Soundararajan, K. (2012). Specific removal of motion artifacts in medical image processing. IJECCE, 3(3), 227-229.