INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.625

Revolutionizing Direct-to-Consumer E-Commerce for Farmers and Buyers to Empower Agriculture

Dr.M.V.Bramhe [*1], **Mohit Kumar**[*2], **Singay Wangchuk**[*3], **Shreyash Kapse**[*4], **Shashwat Balamwar**[*5],

Rutuja Thaokar[*6], **Sanskreeti Meshram**[*7]

Professor, Department of Information Technology, St. Vincent Pallotti College of Engineering and Technology, Nagpur, India[*1]

Student, Department of Information Technology, St. Vincent Pallotti College of Engineering and Technology, Nagpur, India[* 2 3 4 5 6 7]

ABSTRACT: The agricultural e-commerce platform is at the vanguard of a technological revolution in the traditional agricultural marketplace. By focusing on eliminating historical obstacles like intermediary influence, transaction opaqueness, and operational inefficiencies, this project establishes a revolutionary approach to agricultural commerce. The incorporation of innovative features, such as social media integration, forms the basis for community building and engagement, allowing users to easily follow and connect with sellers, creating a collaborative environment that transcends geographical boundaries and not only improves user experience but also fosters knowledge-sharing and insights essential for informed decision-making. The platform's key accomplishment is the removal of intermediary barriers, which enables farmers to display their products directly to buyers. One of the platform's key accomplishments is the removal of middlemen, which enables farmers to present their goods to consumers directly. It is impossible to overestimate the platform's revolutionary influence on the agriculture industry. To fully realize the platform's potential and promote long-lasting positive change in the agricultural sector, the project will require consistent efforts in user uptake, platform improvement, and regulatory compliance. Enhancing market access entails building better roads and storage facilities, utilizing technology (such price-tracking smartphone applications), putting supporting laws into place, and forming cooperatives or other groups that may assist small farmers in negotiating higher prices. Farmers may decrease losses, increase earnings, and make a more significant contribution to the agricultural economy with better market access.

KEYWORDS: authentication, back-end, BCRYPT, Cloud, cloning, front-end, JSON The Project b tokens, MERN stack

I. INTRODUCTION

Krishi Setu is a cutting-edge online marketplace that is transforming the agriculture industry. By offering a direct avenue for the purchase and sale of premium agricultural products, This Project hope to close the gap between farmers and customers. The Project enable farmers to display their produce and establish connections with consumers looking for locally produced, fresh products by doing away with middlemen and encouraging transparent transactions. The Project promote smooth interactions and reciprocal advantages for both buyers and sellers by providing strong communication tools, secure payment channels, and user-friendly interfaces. Come along with us as The Project redefine agriculture's future and advance sustainable, locally driven business. This e-commerce project's backdrop includes a number of important factors and driving forces that are intended to facilitate direct transactions between consumers and sellers of agricultural products: Many middlemen are frequently involved in the conventional agricultural supply chain, which raises prices for both farmers and consumers. Understanding this inefficiency, This Project idea aims to empower farmers to reach a wider market while leveraging the rising demand for fresh, locally produced goods. Many small-scale farmers find it difficult to negotiate appropriate rates for their goods or get access to traditional distribution channels. This project's goal is to empower farmers by giving them a direct line to

consumers so they can display their produce and keep a bigger share of the profits by developing an online platform that is specifically suited to their needs. Consumers are becoming more interested in supporting local farmers and learning where their food originates from. Several compelling elements are the driving force behind This Project e-commerce operation, which aims to directly link consumers and sellers of agricultural products: Encouraging Farmers: The dominance of large-scale distributors makes it difficult for small-scale farmers to reach markets and get fair pricing for their goods. By giving them a platform to sell their goods directly to customers, eliminating intermediaries, and allowing them to generate a steadier income, This Project idea seeks to empower these farmers. Assisting Local Communities: This Project initiative helps local communities thrive by encouraging direct trade between farmers and customers. It strengthens local food systems and creates a feeling of community by encouraging customers to support local agriculture, which may have beneficial social and economic effects like creating jobs. Ensuring Food openness and Quality: This Project tackles the need for more openness in the food supply chain at a time when consumers are growing more concerned about the source and quality of their food. Customers may make better decisions about the food they buy by allowing farmers and customers to communicate directly, which promotes responsibility and confidence in the process. Minimizing Environmental Impact: Conventional agricultural supply chains can include a great deal of storage and transportation, which increases carbon emissions and degrades the environment. This Project initiative supports environmental sustainability by minimizing the carbon footprint associated with food production and distribution by encouraging local sourcing and shortening the distance food travels from farm to table. Improved market accessibility enables farmers to invest in quality enhancements, lower poverty, and boost food security for both their local communities and the country at large. The agricultural sector, which continues to be an essential component of the economies of nations like India, is therefore strengthened. Farmers can obtain higher pricing and lower post-harvest losses by expanding their access to markets. Building improved transportation and storage facilities, establishing farmer cooperatives, putting supporting legislation into place, and offering real-time market pricing information via digital platforms are all important ways to increase market accessibility.

Seasonal variations in supply and demand frequently affect agricultural products, which can have an effect on pricing and inventory control. The suggested remedy is to use dynamic pricing algorithms that modify prices in response to supply, demand, and seasonal patterns. Provide tools like subscription services or pre-ordering to assist farmers in better inventory planning and management. Protecting Privacy and Data Security: The challenge Strong security measures are necessary.

To protect consumer data, put encryption techniques, safe authentication methods, and frequent security assessments into place. Respect privacy rights by adhering to applicable data protection laws, such as the CCPA or GDPR. Supply and Demand Equilibrium the Challenge It can be difficult to balance supply and demand while preventing overstock or stockouts, particularly for perishable agricultural items. Suggested Resolution: To more precisely estimate future demand, apply demand forecasting algorithms based on market trends, customer preferences, and historical data. During periods of high demand or excess inventory, provide discounts or promotions as incentives to purchasers.

II. LITERATURE REVIEW

In recent years, the agricultural sector has witnessed a surge in the adoption of e-commerce platforms aimed at facilitating direct interaction between farmers and buyers. However, with this advancement comes the pressing need to address critical security challenges inherent in online transactions within the agricultural marketplace. Inspired by recent advancements in enhancing security in various domains, researchers have begun to explore novel approaches to fortify the security measures of agricultural e-commerce platforms

In [1] It highlights the e-commerce-based online selling portals for farmers can eliminate intermediaries and offer better access to markets along with better prices to the farmers. Research indicates the need for digital platforms as a way of solving problems in traditional agricultural supply chains by directly linking the consumers to the farmers. But all these must be worked around: limited digital literacy, lack of connectivity, and issues of trust in order to make such a platform succeed. There are several reasons why e-commerce needs to be user-friendly and safe, so that transactions should flow easily, inventory management and payments could work effortlessly, while government support and initiatives might also ease up barriers for all these. Effective web-based platforms can increase transparency and therefore allow for fairer trade. Ultimately, these kinds of e-commerce portals would create a more

efficient and fairer agricultural marketplace.

In [2] It emerges that e-commerce platforms have gradually become important for organic products, especially in the case of the COVID-19 pandemic. Various studies report how these online platforms helped farmers sell directly to the consumers, improved profitability and reduced intermediaries. Various researches have also described problems that farmers are facing due to e-commerce, like technology barriers and logistics issues. The review further points to a more profitable and accessible market for the small-scale farmers through e-commerce. It concludes by highlighting the fact that e-commerce can facilitate sustainable farming practices and greater farm resilience in adversity.

In [3] The study represents the difficulties that farmers face in traditional markets, such as exploitation by middlemen and low pricing. It underlines how digital platforms can empower farmers by giving them direct access to consumers, thereby reducing dependence on middlemen. The review mentions successful case studies where direct selling models improved market access and profitability for farmers. It also discusses barriers like limited digital literacy and infrastructure, suggesting training and support as solutions. The paper also points out the advantages of increased efficiency in the supply chain and less food waste. Direct selling is proven to support sustainability, rural development, and better price transparency. Literature shows that such systems may be able to create a more equitable agricultural ecosystem. Finally, it points out the potential of technology to transform agricultural markets.

In [4] The study represents the growing role of e-commerce in linking farmers to suppliers, with benefits including better market access, cost savings, and efficiency. However, it identifies some challenges as internet connectivity, digital literacy, and payment systems. Solutions proffered include mobile-friendly platforms and localized content to overcome such barriers. Finally, it concludes that e-commerce has the potential to empower the farmer and transform the agricultural supply chain.

In [5] It highlights how digital platforms enable farmers to reach the consumers directly, cutting out middlemen and increasing the efficiency of the market. The paper indicates the benefits: better pricing transparency, increased income, and efficient supply chains. However, it also has challenges: limited digital literacy, inadequate infrastructure, and poor internet connectivity in the rural areas. The paper emphasizes the role of mobile technology and digital payment systems in making transactions. Case studies presented in the review show successful agricultural e-commerce platforms that have promoted economic growth in rural areas. It also underlines the need for government intervention to address infrastructure gaps. The paper concludes by advocating further innovation, policy improvements, and investment to unlock the full potential of e-commerce for sustainable agricultural development.

In [6] It highlights the benefits of reducing intermediaries, providing farmers with better market access, and ensuring consumers get fresh produce at competitive prices. Studies emphasize the role of technology in overcoming inefficiencies in traditional agricultural supply chains, offering direct marketing opportunities. Platforms can enhance transparency and traceability, improving trust between farmers and consumers. However, challenges such as limited digital literacy, poor connectivity, and security concerns still hinder widespread adoption. Furthermore, the development of user-friendly platforms and the integration of AI and blockchain could enhance efficiency. Future research should focus on addressing these barriers. Overall, these systems hold promise for improving agricultural marketing and fostering sustainable food systems.

In [7] The study explores how e-commerce helps farmers directly access markets, increases price transparency, and minimizes dependency on middlemen. It looks at the means through which agricultural marketplace platforms aid farmers to increase their earnings and reach a wider client base, especially in the rural areas. The paper reveals some of the major obstacles to adoption, which are digital illiteracy, limited access to internet facilities, and insufficient infrastructure. It also mentions successful case studies wherein e-commerce platforms are fruitful through training and support programs. The authors urge coordination among the government, technology vendors, and agricultural stakeholders in light of these challenges. Besides that, they highlight the importance of innovative improvement for the long run so that the platforms continue working efficiently. Overall, the review exemplifies the possibility of e-commerce changing the face of agricultural markets for the betterment of the farming sector.

| Sr No.	Title of Paper	Author Name	Year	Findings
1	Website creation for farmers online selling portal	Mr. B. Bayanand, Mr. M. M. Nirmal, Mr. J. Veera Raghul, Mr. M. Dhanush	4 April 2024	Creating e-commerce-based online selling portals for farmers can improve market access, reduce intermediaries, and enhance the efficiency and transparency of agricultural product sales.
2	Farmers' Profitability through Online Sales of Organic Vegetables and Fruits during the COVID-19 Pandemic—An Empirical Study	Deenadayalu Sudharani Ravindran, Sureshkumar Girija Yogesh	24 April 2023	E-commerce platforms significantly boosted farmers' profitability by facilitating direct sales of organic vegetables and fruits during the COVID-19 pandemic, although challenges in digital adoption and logistics remained.
4	Farmer Product Direct Selling System	P.Madhan Kumar, Dr.E.Ramadevi, M.C.A.,M.Phil	May 2022	The direct selling system effectively improves farmers' market access, ensuring better pricing and reducing reliance on intermediaries. It also highlights those overcoming barriers like digital illiteracy and infrastructure challenges is crucial for successful implementation.
5	Farmkart: e-commerce website for farming related products	Dhananjay Girsawale, Siddhant Chilke, Praful Ramedwar, Shivam Longadge, Prof. Manisha Pise	6 June 2022	E-commerce can enhance farmers' access to necessary agricultural products, improving efficiency and reducing costs. However, challenges like internet connectivity and digital literacy must be addressed through solutions such as mobile-friendly platforms and localized content.

6	E-Commerce in Agriculture	Mamta Patel, Sneha Pandey,Sanjana Shrivastava, Parul Sharga,Prashant Gigaulia	August 2022	Improve market access and income for farmers, challenges like digital literacy and infrastructure limitations hinder broader adoption, requiring enhanced policies and investments.
3	Development of Web Based System for Farmer to Consumer Product Selling Through Direct Marketing	Pritam Ramteke,Sandeep Pathak,Pooja Raut, Pradnya Sarade, Naina Palandurkar	3 March 2020	Developing a web-based system for direct marketing between farmers and consumers can enhance market access, reduce intermediaries, and improve the efficiency and transparency of agricultural product sales.
7	Leveraging E-commerce to Empower Farmers: A Comparative Analysis of Agricultural Marketplace Platforms	S. Khan and R. Patel	April 2019	E-commerce platforms significantly enhance farmers' market access, reduce dependence on intermediaries, and improve price transparency. However, they also highlight challenges such as digital illiteracy and infrastructure issues, which need to be addressed for broader adoption.

III. FLOWCHAR
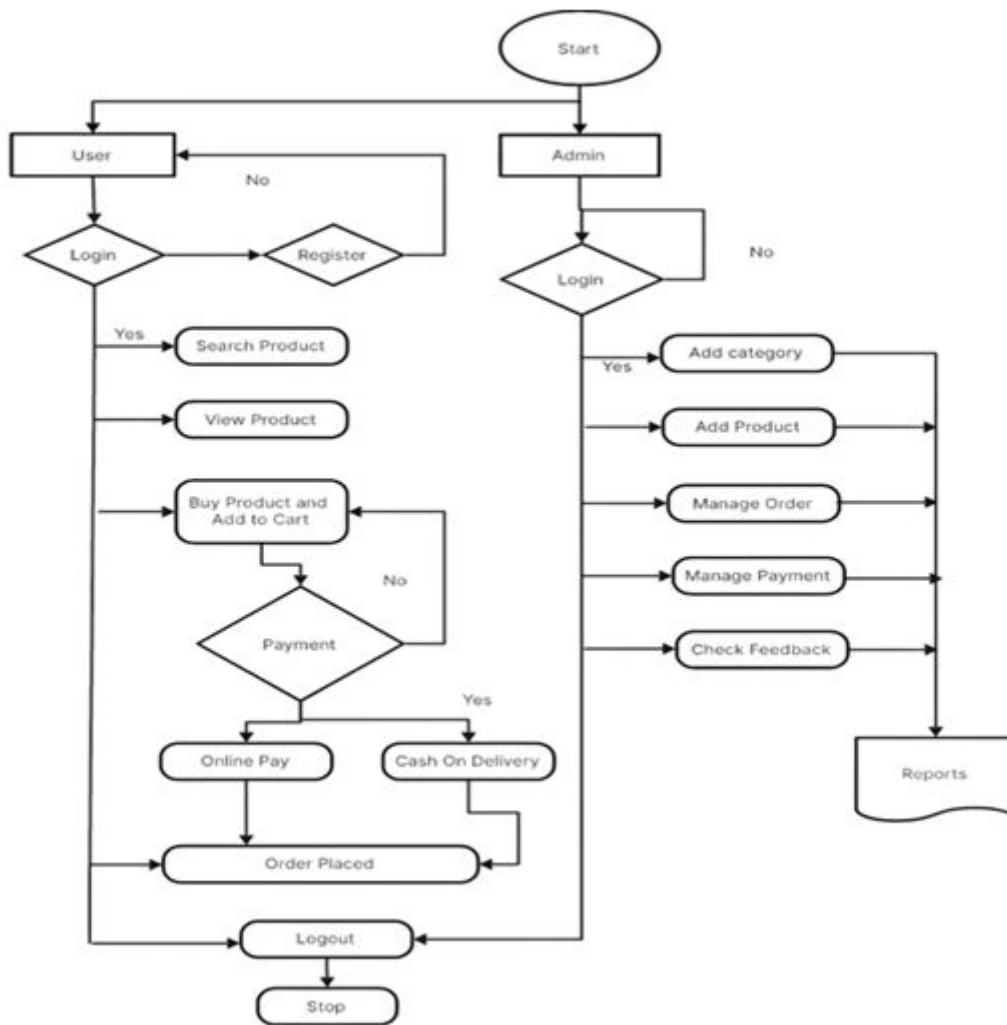
IV. METHODOLOGY

The proposed methodology of the project consists of several components that work together to provide a secure e-commerce website. The main components of the system include:

Research and Analysis:
Conduct market research: this would be an analysis of the agricultural e-commerce market. Know what is currently happening, the challenges, and where an opportunity for this kind of business can be found.
User Analysis Identify target: farmers, buyers, and administrators-knowing their needs, preferences, and pain points. Competitor Analysis: Identifying strengths, weaknesses, and areas of differentiation for the existing agricultural e-commerce platforms. User Interaction: User opens Website/app on device. Once they land on the home page, they would find: recommended products; trending items; special deals offer; and seasonal promotion or deals. It helps the business attract the attention of the user to curated content based on previous browsing or purchasing behavior.

Admin Dashboard: This module will provide a central interface for administrators in order to manage the workings of the platform, monitor performances and make informed decisions. It has the following key feature User Management:

Allow Administrators to manage user accounts, roles, permissions and access levels, including Add or Edit/ Delete user account depending on the need.

Product Management: Offer tools for administrators to manage the product listings, add new products, edit existing ones, and remove old or sold-out items. Order Management: Allow administrators to view orders, manage orders, keep track of order status, process refunds or cancellations, and generate reports of orders for analysis. Analytics and

Registration and Login Module: This module allows users to register and login processes that help in creating an account and safely logging in to the system. Registration Form Users can fill out a registration form using essential details such as name, email address, password, and contact information. Email Verification A verification email is sent after registration to confirm the user's email address and activate his account. Login Form Logged in users can log in by using their email and password credentials. Forgot Password: allows a user to reset the forgotten password; the email address for this is sent through the password reset link.

Profile Management Module: This module allows the users to manage their profiles and update information of personal nature on the website. Profile Settings: It offers viewing and editing facilities in regards to profile information such as name, contact details, address, and profile picture. Change Password: It allows changing a user's password safely and soundly through the site. Communication Preferences: Users have options to manage preferences such as email notification subscriptions or newsletter subscriptions. Account deactivation: The right of users to deactivate or delete the accounts based on their wish, following proper confirmations and verifications.

Photo Upload Module This module allows users to upload pictures of agricultural products on the site for listing and sale. Upload Form: Users can upload pictures of products along with relevant details such as the name of the product, description, category, price, quantity, and location.

Image Upload: Multiple images can be uploaded for every product listing so that people get a view of the products from different angles. Editing and deletion: Editing and removal for photos that a user had once uploaded on his listing. Notification Module This module sends notifications to users for important events and activities on the platform. Email Notifications: The user receives email notifications for actions such as account registration, password reset, photo upload confirmation, and new message alerts. In-App Notifications: Provides in-app notifications for real-time updates on photo-sharing activity, product inquiries, and order status changes. Customization: Allows users to customize their notification preferences, including frequency and types of notifications received.

1. Admin Dashboard functionalities: This is one module that is an administrator control panel with a single-point interface, thus enabling central operations of a given platform by overseeing its performances and deciding accurately.

Creation or Addition of Products: This will offer sellers a chance to develop new products and include the new stock in the catalogue. Creation Form of the Product: Product creation forms wherein sellers include names, description details, categories, price range, number, and pictures among others.

Profit charts and dashboard features: This feature provides sellers with profit charts and dashboard features to monitor sales performance and track earnings. Sales Analytics: Presents visualizations and charts of sales data, including total sales, revenue, profit margins, and top-selling products.

Orders and bill management features: This feature allows sellers to manage orders and bills efficiently, including order fulfillment and invoicing processes. Order Fulfillment: It notifies sellers about new orders and guides them through the fulfillment process, including packaging, shipping, and delivery to customers. Order Tracking: It allows sellers to track the status of orders, update order status, and provide shipping information to customers.

Invoice Generation: The system automatically generates invoices for the orders placed by customers, which can include itemized billing, payment terms, and tax calculations. Payment Reconciliation: The system helps sellers reconcile payments received with the orders fulfilled, thereby making sure that accounting and financial reporting are accurate.

Refunding feature: This allows sellers to process refunds for orders and manage refund requests from customers. Refund Policy defines the seller's refund policy, including eligibility criteria, refundable items, and refund processing timelines.

Refund Requests: Customers can request refunds for eligible orders, and sellers can accept, reject, or negotiate the refund. Refund Processing: It guides the seller through the refund processing workflow, which includes issuing refunds, updating the status of the order, and communicating with the customer regarding the resolution of the refund.

2. Buyer side features: These buyer-side features have been incorporated into the site so that buyers can go through a smooth and exciting shopping experience, which enhances their trust, satisfaction, and loyalty in the agricultural sector.

Product Discovery and Search: Browse through a plethora of agricultural products listed on the marketplace. Search for specific types of products using keywords or categories, or even specific filters like price range and location, and seller rating. Explore featured products, best sellers, or new arrival to discover trending items.

Product Information and Reviews: Detailed information for each product is visible, including descriptions, images, prices, and seller details. Other buyers' reviews and ratings help make an informed purchasing decision. Rating and review for products purchased enables one to share experiences and feedback with the community.

Cart Management: Add items to a shopping cart to aggregate and checkout easily. Review and edit items in the cart, including changing quantities or deleting items. Checkout to finalize your purchase of selected items.

Order placement and tracking: Place orders securely with options to choose products of your interest, with cash on delivery, or online payment. Confirm the status of order through confirmation, tracking details, and real-time tracking of shipments. Receive notification for successful delivery, updates in shipping and delivery schedules.

Account Management: Register for a buyer account to access personalized features and services. Update profile information, including contact details, shipping addresses, and communication preferences. View order history and track previous purchases for reference and reordering.

Notifications and Alerts: Receive notifications and alerts for product updates, promotions, or special offers. Know when the status of your orders changes, including order confirmations, shipping notifications, and delivery updates. Access customer support services to help with inquiries, order issues, or product-related questions. Contact sellers directly for additional product information, customization requests, or post-purchase support.
Feedback and Suggestions: Offer feedback and suggestions to the sellers or platform administrators regarding improving product offerings, services, or user experience. Participate in surveys or feedback forms to contribute to the continuous improvement of the platform.

V. CONCLUSION AND FUTURE SCOPE

The agricultural e-commerce platform has been designed to directly connect farmers with consumers, eliminating middlemen and improving market access. With features like easy product listings, secure payment processing, and real-time order tracking, the platform enhances the overall experience for both buyers and sellers. The integration of social media for engagement and community building fosters trust and transparency, benefiting both farmers and consumers. However, challenges such as limited digital literacy and connectivity issues in rural areas may affect widespread adoption. Moving forward, expanding payment options and mobile accessibility will further enhance the platform's impact on the agricultural sector.

The future scope of the agricultural e-commerce platform can focus on increasing its accessibility and reach. Implementing multi-language support would make the platform more accessible to farmers and consumers from different linguistic backgrounds, especially in regions with diverse languages. Additionally, incorporating mobile-friendly features and offline capabilities could help farmers in rural areas with limited internet access. To improve the user experience, adding tools to track products and show ratings can help build more trust with buyers. Lastly, adding features such as a chatbot for real-time assistance and educational resources for farmers would enhance platform usability and empower them to make better business decisions.

REFERENCES

[1] Mr. B. Bayanand, Mr. M. Nirmal, Mr. J. Veera Raghul, Mr. M. Dhanush, "Website creation for farmers online selling portal", 4 April 2024.

[2] Deenadayalu Sudharani Ravindran, Sureshkumar Girija Yogesh, "Farmers' Profitability through Online Sales of Organic Vegetables and Fruits during the COVID-19 Pandemic—An Empirical Study", 24 April 2023.

[3] P.Madhan Kumar, Dr.E.Ramadevi, M.C.A.,M.Phil, "Farmer Product Direct Selling System " , May 2022.

[4] Dhananjay Girsawale, Siddhant Chilke, Praful Ramedwar, Shivam Longadge, Prof. Manisha Pise, "Farmkart: e-commerce website for farming related products", 6 June 2022.

[5] Mamta Patel,Sneha Pandey,Sanjana Shrivastava, Parul Sharga,Prashant Gigaulia, "E-Commerce and Entrepreneurship in Agricultural Markets", August 2022.

[6] Pritam Ramteke,Sandeep Pathak,Pooja Raut, Pradnya Sarade, Naina Palandurkar, "Development of Web Based System for Farmer to Consumer Product Selling Through Direct Marketing ", 3 March 2020.

[7] S. Khan and R. Patel, "Leveraging E-commerce to Empower Farmers: A Comparative Analysis of Agricultural Marketplace Platforms", April 2019.

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

📱 9940 572 462 🟢 6381 907 438 ✉️ ijircce@gmail.com

Scan to save the contact details