Identifying Fake Products through a Barcode based System

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ABSTRACT

The increasing prevalence of counterfeit products in various industries poses significant challenges to consumer safety, brand integrity, and economic stability. This paper proposes a novel approach to combat counterfeit goods by integrating blockchain technology with barcode scanning systems. The authentication and traceability of products can be verified securely by assigning a unique barcode to each product and linking it to an immutable blockchain ledger. Product information, such as manufacturing details and distribution history, cannot be tampered with because of the decentralized nature of blockchain. The system permits consumers and retailers to scan the barcode using mobile devices or scanners, resulting in the instant retrieval of verified product data from the blockchain. Product security, transparency, and traceability throughout the supply chain are enhanced by this solution, which empowers users to effectively identify counterfeit products. The proposed system has a robust mechanism that prevents counterfeit goods, increases consumer trust, and ensures the integrity of global supply chains.

I. INTRODUCTION

Blockchain technology is used to identify counterfeit products. In the proposed system, we are assigning a bar code to a particular product created by the manufacturer along with all the details of the product and the end customer can scan that bar code to get all information about that product. The user is able to tell if the product is real or fake after scanning the bar code.

Our project proposes a product that is easy to use, precise, and affordable in terms of anti- counterfeiting. It comprises 2 modules, including Admin and User. The admin will have access to add, update, view, and delete products. They also have to include the product information, including the product serial number, date of manufacture, origin of the product, expiration date, etc., along with the seller's information. Fake entries are

also accessible to the admin.

Counterfeiting is a problem that affects many industries, including pharmaceuticals, electronics, fashion, and luxury goods. The proliferation of counterfeit products not only poses significant risks to consumers, businesses, and economies, but also undermines trust in brands and erodes consumer confidence. Traditional authentication methods like holographic stickers and serial numbers are often not enough to effectively combat this problem as counterfeiters have become more sophisticated in replicating these features. As a result, it is essential to develop innovative solutions that can reliably verify the authenticity of products and detect counterfeit items. The use of block-chain technology has become a promising tool for addressing different challenges in supply chain management, such as counterfeit detection.

The potential of block-chain in authenticating products and enhancing supply chain transparency has been explored by several initiatives in recent years. Many of these initiatives have concentrated mainly on high-value goods or relied on proprietary technologies that hinder interoperability and scalability. This paper suggests a barcode-based blockchain system that provides a cost-effective and scalable solution for authenticating a diverse range of products across various industries.

II. RELATED WORK

➤ Programming Language: JavaScript

JavaScript is the core programming language of our auction platform, used on both the frontend and backend to enable seamless interactivity and real-time updates. On the frontend, JavaScript powers dynamic UI components, ensuring users can place bids, receive updates, and navigate through the platform smoothly. It handles event-driven functionalities such as validating user input, updating auction listings dynamically, and integrating with WebSockets for real-time bid tracking. On the backend, JavaScript ensures efficient handling of server-side logic, including processing user requests, managing auction data, and executing background tasks such as closing auctions and notifying winners.

➤ Frontend: HTML, CSS

HTML (Hyper Text Markup Language) is the primary language for creating and structuring content on the web. Developers can use tags and attributes to define the layout, structure, and elements of a webpage. Tags are used by HTML to mark up content, including headings, paragraphs, links, images, and other multimedia

➤ CSS is a stylesheet language that is used to control the visual appearance and layout of HTML elements on a webpage. While HTML is responsible for structuring content, CSS is

responsible for defining how it is presented, such as colors, fonts, spacing, positioning, and overall layout. CSS enables developers to apply styles to either individual elements or entire groups of elements, by targeting specific HTML tags, classes, or IDs with selectors. Through media queries and other features, responsive designs can be created that adapt to different screen sizes, including desktops, tablets, and mobile devices.

➢ Backend: PHP

Node.js serves as the backend of our E-Auction platform, offering a high-performance, non- blocking runtime environment. It efficiently manages multiple simultaneous connections, ensuring smooth user interactions even under heavy traffic. It manages Real-Time Bid Processing WebSockets handle bid submissions and update auction statuses instantly, ensuring real-time engagement. User Authentication and Authorization includes Secure login and registration mechanisms manage user access and permissions. It manages Auction Lifecycle Management which the system automates tasks such as starting, updating, and closing auctions, reducing manual intervention.

➢ Database: PHP, MYSQL

The typical way to talk about PHP and databases is to talk about how PHP interacts with databases to store, retrieve, update, and delete data. SQL (Structured Query Language) is commonly utilized to perform this task, and MySQL is one of the most widely used databases in PHP.

MySQL is an open-source relational database management system (RDBMS) that utilizes SQL to manage and manipulate data. Database development and management in web applications is widely used, with support for features like data storage, retrieval, and modification. MySQL creates tables that contain rows and columns, allowing users to store and retrieve data efficiently. Performing operations on the data can be done using SQL commands like SELECT, INSERT, UPDATE, DELETE, and JOIN.
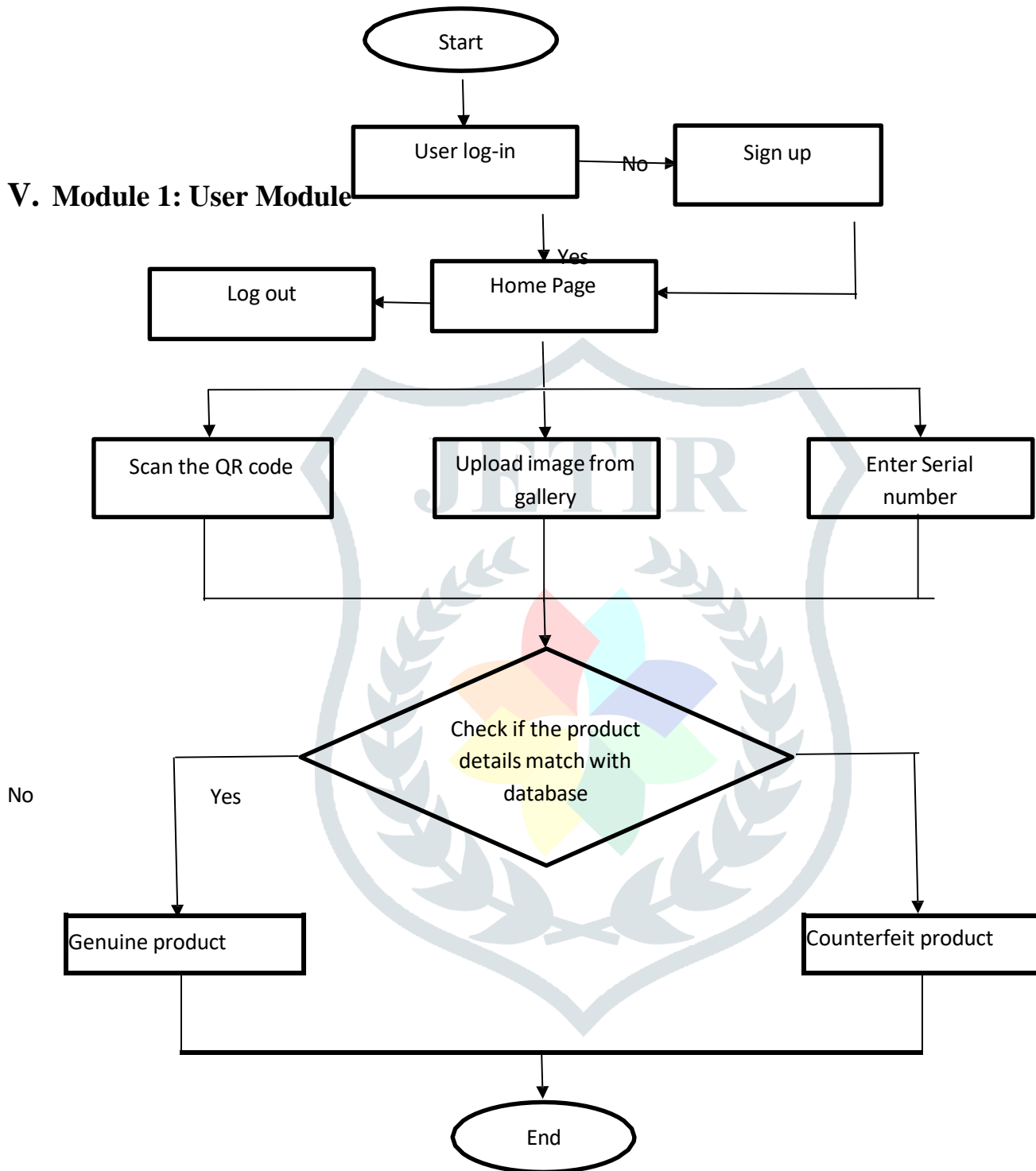
III.   SYSTEM ARCHITECTURE
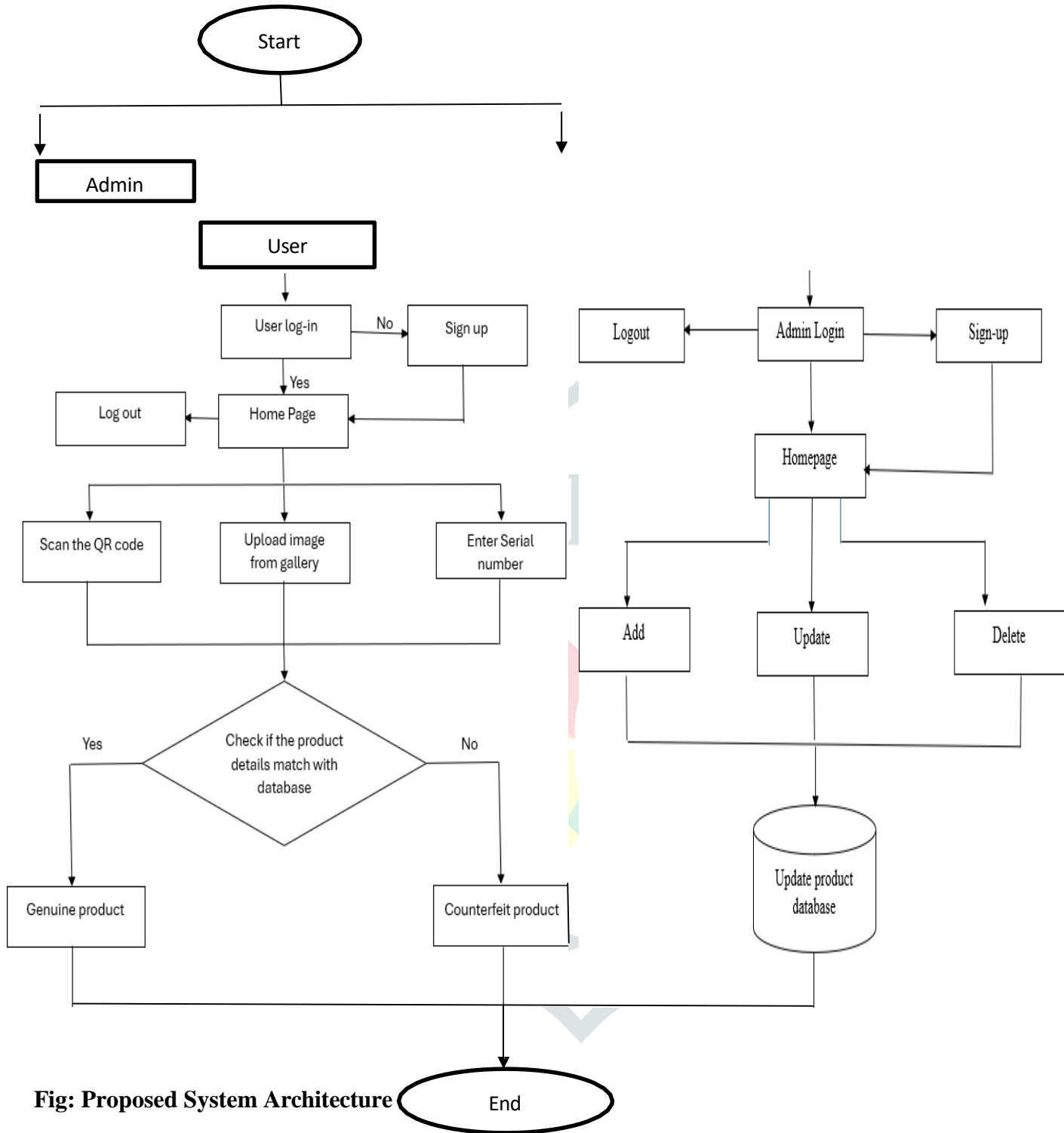
Fig: Proposed System Architecture

IV.　　IMPLEMENTATION AND MODULES

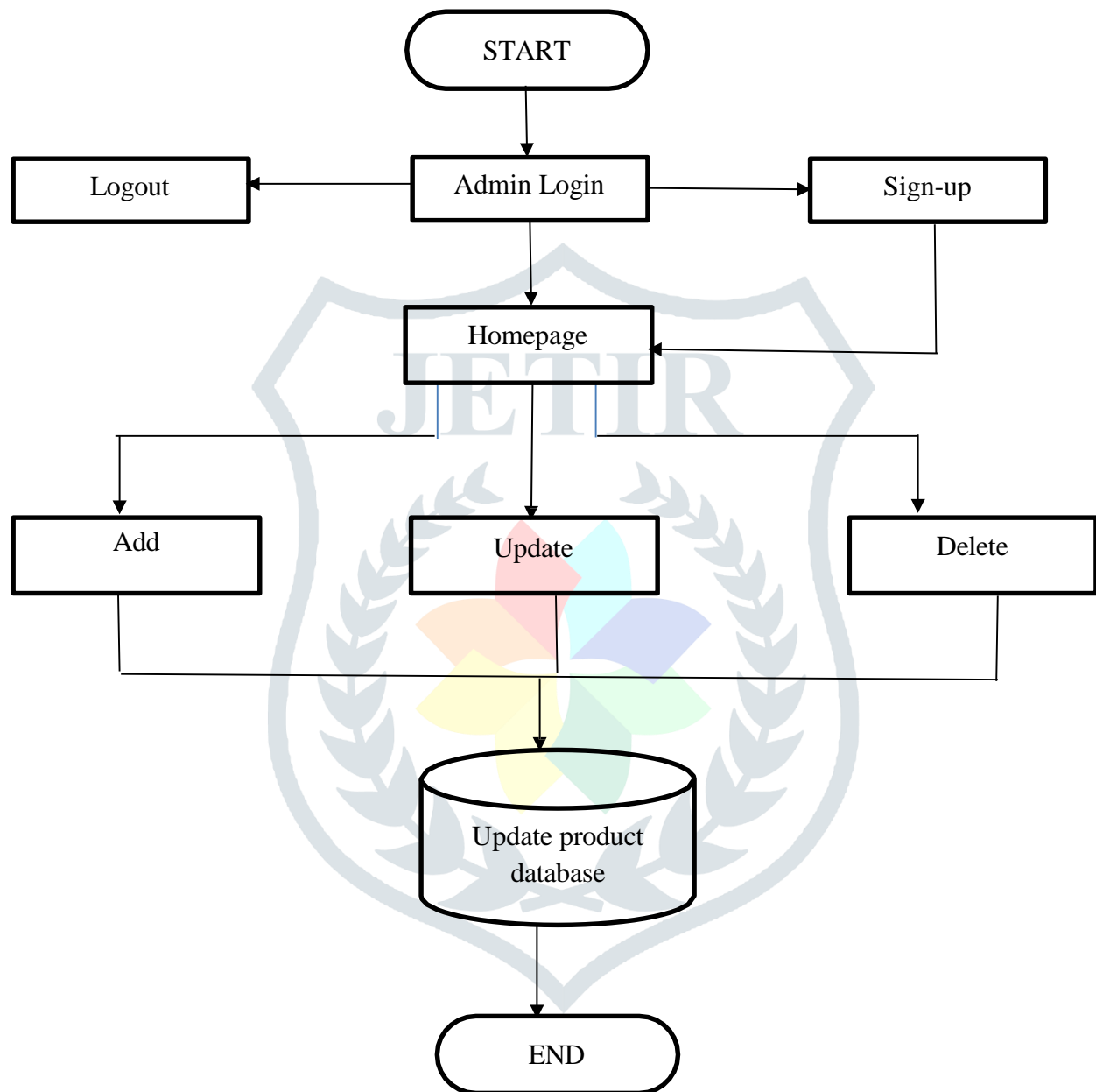## V. Module 1: User Module

Fig : User Module

1. Registration: Users must register to become a part of the project.

2. Login: Users have to log in themselves to access the project.

3. Scan QR code: User uploads the QR code using a web application and then displays all the information of the product on our screen.

4. Enter a unique ID: The user enters the unique ID using a web application and then displays all product information on our screen.

Module 2: Admin Module

Fig: Admin Module

1. Registration: Admins must register to become a part of the project.

2. Login: The admin has to log in themselves to access the project.

3. Manage requests: After the manufacturer sends a request, the admin will check it and, if it is correct, approve or reject it.

4. Send alerts: The admin will send alerts for both accepted and rejected requests.

CONCLUSION

The integration of blockchain technology with barcode scanning presents a transformative solution to the widespread issue of counterfeit products. By leveraging blockchain's immutability and transparency, this system ensures that each product's authenticity can be easily verified at any point in the supply chain. The use of unique barcodes linked to a secure blockchain ledger not only empowers consumers to verify products in real-time but also increases transparency and traceability, thereby reducing the entry of counterfeit goods into the market. This approach offers enhanced security, trust, and accountability, benefiting both consumers and businesses alike. While challenges such as adoption and scalability remain, the proposed system has the potential to significantly mitigate the impact of counterfeit products across various industries, ultimately fostering a safer, more reliable marketplace.

REFERENCES

1) Identifying Fake Products through a Barcode based Blockchain System Anuja Kokate, Shivanjali Phalke, Siddhi Kekan, Prof. Sanjay Ranveer August [2024]

2) https://ieeexplore.ieee.org/abstract/document/9835926/authors#authors

3) Identification of Fake Products Using Blockchain Antony Roshan Dsouza Shantala Devi Patil . Amuthabala K [2023]

4) https://www.projectwale.com/2022/07/11/fake-product-identification-using-blockchain- technology

5) Detection of Fake Product using Blockchain Technology Ms. Renukadevi B Bharathy R Abinesh K [2022]

6) https://ijariie.com/AdminUploadPdf/Fake_Product_Detection_Using_Blockchain_Technolog y_ij ariie14881.pdf.

7) Fake Product Identification using Blockchain Publish Year Mohammad Guffran Sabila, Kattula Dharani Sai, Vendra Meghana, Mattaparthi Jabili Devi, Mrs. K. V. Nageswari [2022]

8) https://ieeexplore.ieee.org/abstract/document/9835926