DroPilot : AI Assisted Dropshipping Automation

Final Year Project Proposal

Session 2021-2025

A project submitted in partial fulfillment of the

COMSATS University Degree

of

BS in Computer Science / Software Engineering (CUI)

Department of Computer Science

COMSATS University Islamabad, Lahore Campus

27 October 2024

Project Abstract

DroPilot - AI Assisted Dropshipping Automation

DroPilot aims to transform the dropshipping industry by leveraging artificial intelligence (AI) to automate and streamline all key processes. The platform will enable businesses to concentrate on growth by handling time-intensive tasks through specialized tools designed to enhance the entire dropshipping workflow. DroPilot plans to set up a personalized e-commerce store for each user, automatically importing product data—such as descriptions, pricing, and inventory status—from reliable suppliers and updating this information in real-time. Through automated management of purchasing, inventory, and shipping, DroPilot will help ensure accuracy and prompt delivery. Additionally, an AI-driven chatbot will provide 24/7 customer support, efficiently resolving customer queries to enhance satisfaction and operational efficiency.

1 Introduction :

Dropshipping is an e-commerce model where a store sells products without keeping them in stock. Instead, when a customer orders an item, the store purchases it directly from a third-party supplier, who ships it straight to the customer. This means the seller doesn't handle inventory or shipping. It's popular because it lowers startup costs and reduces risk, as the seller only buys products after a sale is made. However, profits can be lower than traditional retail since sellers often pay higher per-item costs, and they rely heavily on suppliers for stock and shipping quality, impacting customer experience.

DroPilot is an AI-powered Website that streamlines and automates the entire process for online store owners. Designed to handle time-consuming tasks with speed and accuracy, it simplifies business management by automating inventory, product details, and order fulfillment.

For each user, DroPilot creates a fully customized e-commerce website, handling everything from product listings to stock tracking and shipping logistics. Products, descriptions, and images are directly pulled from the supplier's site, and updates are managed in real-time—if a supplier changes product details or stock levels, DroPilot immediately reflects these changes on the user's store. This way, users can focus on strategy and growth while DroPilot takes care of the operational details.

1.1 Background & Objectives :

Dropshipping is a way of selling products online without holding any inventory. Instead of stocking up on goods, the seller lists products in their store. When a customer places an order, the seller purchases the item from a supplier, who then ships it directly to the customer. Essentially, the seller acts as a middleman, handling the sales but leaving the logistics to the supplier.We aim to automate this process of listing and updating products on the store and forwarding the orders. Essentially removing the manual workload so that the store owners can focus on other things like marketing , communication and building their brands while the store works itself.

1.2 Sub-Tasks & Techniques :

The project is divided into several sections, each designed to solve specific problems in the dropshipping process:

1.2.1 Real-Time Data Extraction and Aggregation:

DroPilot's data extraction module will go beyond standard web scraping to provide sophisticated, real-time data synchronization between supplier websites and the user's storefront. Utilizing a combination of advanced data-crawling algorithms and API integrations (where available), DroPilot will continuously monitor multiple supplier sources, detecting changes in product details, pricing, stock levels, and even new product additions.

To achieve true real-time functionality, DroPilot will employ event-driven data pipelines that immediately push updates from suppliers to the user's store as soon as changes are detected. This will involve intelligent scheduling and rate-limiting to avoid overwhelming suppliers' systems, while ensuring updates are near-instantaneous. Additionally, advanced data validation algorithms will be implemented to verify and standardize incoming information, ensuring consistent quality and accuracy across all listings.

This constant data vigilance not only enhances the customer experience with accurate and timely information but also enables store owners to maintain a competitive edge by instantly reflecting market conditions on their storefront.

1.2.2 Responsive Store Website:

DroPilot will create a customized, fully responsive e-commerce website for each user, optimized to provide a smooth shopping experience across all devices, including mobile. This site will be tailored to reflect the user's brand and integrated with DroPilot's automated features like product updates, order management, and customer support. The responsive design ensures customers have a consistent and enjoyable experience whether they're browsing on desktop or mobile.

1.2.3 Mobile App for Store Owners:

DroPilot will provide a dedicated mobile app for store owners to manage and monitor their business from anywhere. This app will give users easy access to real-time data on product listings, inventory, orders, and customer interactions. The app will also send notifications on key updates, such as low-stock alerts, new orders, and important analytics, so store owners can stay on top of their business effortlessly. The mobile app enhances convenience, allowing users to oversee store operations without needing constant access to a computer.

1.2.4 Order Automation and Fulfillment:

This component automates the order process by forwarding customer orders directly from the user's store website to the supplier. Once an order is placed, DroPilot notifies the supplier and provides the necessary shipping details, minimizing manual intervention and reducing errors. With tracking integration, customers can stay updated on their order status, ensuring a smooth and timely delivery experience.

1.2.5 AI Chatbot for Customer Support:

DroPilot's AI-powered chatbot, available 24/7 on the store website, will handle customer inquiries about products, orders, and store policies. The chatbot uses natural language processing (NLP) to deliver accurate and personalized responses, enhancing customer satisfaction. This feature frees up

time for business owners by automating customer service, ensuring prompt support and a professional user experience.

1.2.6 AI-Driven Copywriting and Content Enhancement:

To maximize sales, DroPilot will use AI-based copywriting tools to refine or create compelling product descriptions and marketing content on the store website. These AI-driven descriptions will highlight each product's unique benefits, enhancing conversion potential. Additionally, AI-generated SEO keywords will improve search visibility, driving traffic to the website.

1.2.7 Inventory and Stock Management:

DroPilot will provide real-time inventory tracking, automatically updating stock levels on the store website based on supplier availability. This module will notify users of low-stock or out-of-stock items on the mobile app, preventing overselling and ensuring a reliable storefront. The inventory management feature keeps store owners informed and minimizes stock-related issues.

1.2.8 Performance Analytics and Business Insights:

DroPilot will offer analytics tools accessible via the mobile app, providing insights into sales trends, customer behavior, and product performance. Through AI-driven analytics, users can gain a clear understanding of their store's strengths and opportunities, from identifying popular products to forecasting demand. These insights enable data-driven decisions, helping users optimize their listings and grow their business efficiently across all channels.

1.3 Evaluation Criteria :

To evaluate the success of DroPilot, several criteria will be used:

1.3.1 - Efficiency Improvement: *A decrease in manual work evaluated by the time saved when handling orders and managing inventory.*

1.3.2 - Customer Engagement: *Tracking customer feedback, we have noted improvements in both the time and quality of customer response.*

1.3.3 - Business Growth Metrics: *Automation and trend analysis have led to an uptick in sales, greater product selection, and better customer retention.*

1.3.4 - Technical Robustness: *The efficient operation of APIs, the precision of web scraping, and how effectively the platform can manage multiple vendors along with a multitude of products.*

2 Success Criterion :

The measure of the DroPilot project's success will rest on its ability to automate significant segments of the dropshipping process, improving efficiency, the satisfaction of customers, and the growth of the business. Success will depend on a defined set of core, certifiable milestones that correspond with the principal targets of the project. There exists a achievable and modest success criterion designed to guarantee that the outcome of the project fulfills requirements and has the potential to surpass them.

2.1 Core Success Criteria :

- **Functional Automation:** To be effective, the system needs to automate no less than 80% of the manual efforts involved in dropshipping, covering web scraping, order processing, and customer support. The verification will take place via performance tests showing that these tasks are performed with little human contribution and with zero critical errors.
- **Customer Engagement:** The chatbot enabled by AI ought to resolve at least 90% of customer questions without human involvement. The standard will be met by recording the chatbot's answer accuracy and effectiveness from customer feedback and interaction tracking.
- **Accuracy of Data Scraping and Order Automation:** For web scraping, the goal is to extract correct product data with a success rate no less than 75%, and the order automation should produce on-time and accurate processing for at least 90% of transactions. These criteria will receive verification through trials using real data and simulations of order processing.
- **User Adoption and Feedback:** An indication of success for a project will come from favorable feedback from a sample group of dropshipping companies. According to our estimates, at least 70% of users must feel a rise in operational efficiency and more satisfaction after using DroPilot.
- **Scalability and Integration:** It is necessary for the platform to illustrate its capability to integrate smoothly with two or more different e-commerce platforms and display scalability to manage a variety of vendors and product groups. Success in this sector will be demonstrated by integration tests and load test metrics.

2.2 Evidence of Success :

The success of the project will be evidenced by:

- Extensive accounts on the performance and accuracy of task automation.
- Chatbot effectiveness reflected in customer interaction logs.
- User feedback concerning satisfaction surveys.
- Data which indicates enhancements in operational efficiency alongside sales growth.
- Technical reporting on scalability alongside API integration performance.

3 Related work :

3.1 Dropy.ai [1]:

Dropy.AI aims to simplify dropshipping by automating core tasks with AI. It helps users find products, keeps stores updated with new items, and offers an AI-driven customer support system. While the brand spy tool is useful for checking competitors' strategies, it's not revolutionary and might not always provide a clear advantage.

3.2 AutoDS [2]:

AutoDS is known for being easy to use, especially for beginners, but it's fairly basic. It automates routine tasks like processing orders and adjusting prices when suppliers change them. You can quickly import products from platforms like AliExpress, though it can feel limited if you're looking for more advanced customization or control.

3.3 Glitching AI [3]:

Glitching AI offers tools to discover trending products and manage orders, but its standout feature is access to a network of suppliers. However, the platform's analytics are decent but not as in-depth as some users might want, and while the automated marketing tools are convenient, they can feel generic without much personalization.

3.4 Sell The Trend [4]:

Sell The Trend gives access to over 7 million products and lets you fulfill orders with one click. Its NEXUS tool helps track competitors' trends, but some may find it overwhelming due to the sheer volume of data. The built-in marketing tools are functional but won't blow you away if you're expecting cutting-edge features.

3.5 AppyPie [5]:

Appy Pie is a no-code development platform that enables users to create websites, and other digital solutions without needing extensive programming knowledge. The platform's primary aim is to democratize web development by providing a user-friendly interface and a variety of templates that cater to different industries and functionalities.

3.6 Mobirise [6]:

Mobirise is a user-friendly website builder that allows individuals and businesses to create responsive websites without needing any coding skills. The platform is designed for simplicity, featuring a drag-and-drop interface that facilitates the construction of websites through customizable templates and pre-built blocks.

4 Project Rationale :

E-commerce's fast growth is largely responsible for the rise of dropshipping, a business model that permits retailers to deal in products without keeping a stock. The operational difficulties related to the management of product listings, order processing, customer service, and market competition often become too much, especially for small and medium enterprises. DroPilot plans to take on these issues by providing an automated system that eases the process of dropshipping. Given today's digital climate, where automation and artificial intelligence are innovating business models in many industries, this project is extremely relevant.

The catalyst for DroPilot comes from the requirement to decrease the involvement of humans in ordinary and routine tasks, so that businesses can channel their energy into

scaling and making strategic choices. We will obtain precious experience in the realm of developing AI powered solutions, while also integrating a variety of technologies, such as machine learning, natural language processing (NLP), and automation frameworks, and learning about the dynamics of the e-commerce market. Our goals for this research and development are to broaden our understanding of the tie between AI and business automation, a field that is expanding rapidly with great promise.

4.1 Aims and Objectives

DroPilot aims to create a fully automated, AI-powered dropshipping solution that reduces human workload by handling all aspects of the dropshipping process—from store creation and real-time data updates to order processing and customer support. By managing operational tasks, DroPilot enables users to focus on strategic growth rather than daily maintenance.

4.2 Scope of the Project

DroPilot's scope encompasses automated store creation, a mobile app for store management, product listing, real-time product data synchronization, order processing, AI-driven customer service, and in-depth analytics for dropshipping businesses. Key tasks and deliverables have been structured to accomplish this:

4.2.1 *Project Goals:*

To build a comprehensive dropshipping platform that automates intensive tasks like real-time data updates, inventory management, order forwarding, and customer support. DroPilot's goal is to empower store owners with a responsive store website for customers and a dedicated mobile app for streamlined store management.

4.2.2 *Deliverables:*

- **Real-Time Data Extraction Module:** An advanced system that continuously aggregates and updates product details from supplier sites (e.g., pricing, stock, descriptions), ensuring accuracy on the store website.

- **Responsive Store Website:** A fully branded, responsive e-commerce website that adapts seamlessly to both desktop and mobile devices, providing a consistent shopping experience.

- **Store Management Mobile App:** A mobile app specifically designed for store owners to manage inventory, orders, and analytics on the go. The app will provide real-time notifications and insights to keep users informed and enable easy access to essential features.

- **AI-Powered Customer Support Chatbot:** A 24/7 chatbot built with NLP models to manage customer inquiries efficiently and provide real-time assistance.

- **Automated Order Processing System:** A system to forward orders from the user's store to suppliers, complete with tracking updates for both store owners (via mobile app) and customers (via website).

- **Comprehensive Documentation:** Detailed documentation covering setup, use cases, and future scalability options, ensuring users can easily adopt and understand the system's capabilities.

4.2.3 Features and Functions:

- **Automated Real-Time Product Data Sync:** A sophisticated data extraction system that synchronizes product details with supplier changes, providing near-instant updates to inventory, pricing, and product descriptions on the website.

- **Order Automation and Tracking:** Automated order processing that forwards orders to suppliers and sends real-time status updates to the store owner's mobile app and customers via the website.

- **Mobile App for Store Management:** A dedicated mobile app that allows store owners to manage inventory, view analytics, receive alerts on stock levels or orders, and stay informed of critical business metrics anytime, anywhere.

- **AI Chatbot for Continuous Customer Support:** An NLP-powered chatbot available on the store website, offering assistance with inquiries and order tracking, ensuring efficient 24/7 customer support.

- **Performance Analytics and Insights:** Data-driven tools that analyze sales trends, customer behavior, and product performance, accessible from the mobile app to inform strategic decisions.

- **AI-Driven Copywriting:** AI-generated product descriptions optimized for SEO and conversions, helping to attract traffic and enhance the shopping experience on the website.

4.2.4 Tasks:

- Implement a sophisticated real-time data extraction module, using advanced algorithms and machine learning to monitor supplier sites for changes and sync updates seamlessly.

- Develop a responsive e-commerce website for customers that integrates DroPilot's automation and AI tools.

- Design and build a store management mobile app, ensuring it includes real-time notifications, inventory management, and analytics features for easy, on-the-go management.

- Integrate an AI-powered chatbot using NLP to handle customer inquiries effectively, minimizing human support needs.

- Conduct extensive user testing and gather feedback to refine the platform's usability and performance, particularly for the mobile app and customer website.

4.2.5 *Deadlines:*

- **Real-Time Data Extraction Module:** Completion within the first two months, ensuring reliable data synchronization across supplier sites.

- **Responsive Website and Store Management Mobile App:** Developed by month four, allowing for testing and early feedback on user experience.

- **Order Automation and AI Chatbot:** Testing phase by month six, fully integrated with supplier systems and store platforms.

- **Full System Deployment and Testing:** Comprehensive deployment and final testing by the end of month eight, delivering a streamlined, automated dropshipping platform across all modules.

5   Proposed Methodology and Architecture

The development will be based on rapid and iterative processes to ensure ease of use, continuous feedback and further development. The approach includes design, development and deployment phases, as well as regular testing and feedback to ensure the system meets performance targets.

5.1   Step-by-Step Procedures

5.1.1 *Requirements Gathering and Analysis:*

- Identify and document functional and non-functional requirements with potential users and other stakeholders.

- The paper also outlines the various features which include web scraping, order automation, AI chatbot.

5.1.2 *System Design:*

- Design the platform in a way that the architecture is not rigid and can easily accommodate further expansion.

- Design flowcharts and block diagrams illustrating data flow between different system components.

5.1.3 Web Scraping Development:

Set rules for fetching information about products from dropshipping websites, with the focus on reliability and frequent updates.

5.1.4 Backend Development:

The backend should be created for User Authentication, User Management, Store Management,Product Management and Order Management.

5.1.5 AI Chatbot Development:

- Implement the customer support chatbot by using natural language processing models.
- Teach the chatbot to respond to common queries, order status checks and other information related to customer support.

5.1.6 Order Automation Implementation:

- Design and implement an order processing system that will communicate with supplier systems to enable proper order, inventory, and shipment management.
- Implement event-driven architecture to perform real time actions when an order is placed.

5.1.7 User Interface and Front-End Development:

- Develop the frontend part of the application to provide the users with easy access to the product information, order management.
- To ensure that the design is compatible with different devices, incorporate features of responsive design.

5.1.8 Testing and Iteration:

- Implement four types of tests: unit tests, integration tests, system tests, and other types of tests to check the functionality, performance, and scalability.
- Collect user feedback and build on features to improve the overall user experience of the platform.

5.1.9 Deployment:

- Host the platform on the cloud services so that it can be easily scalable and highly available.
- Use Continuous Integration/Continuous Deployment (CI/CD) to avoid interrupting users and allow for frequent updates and enhancements.

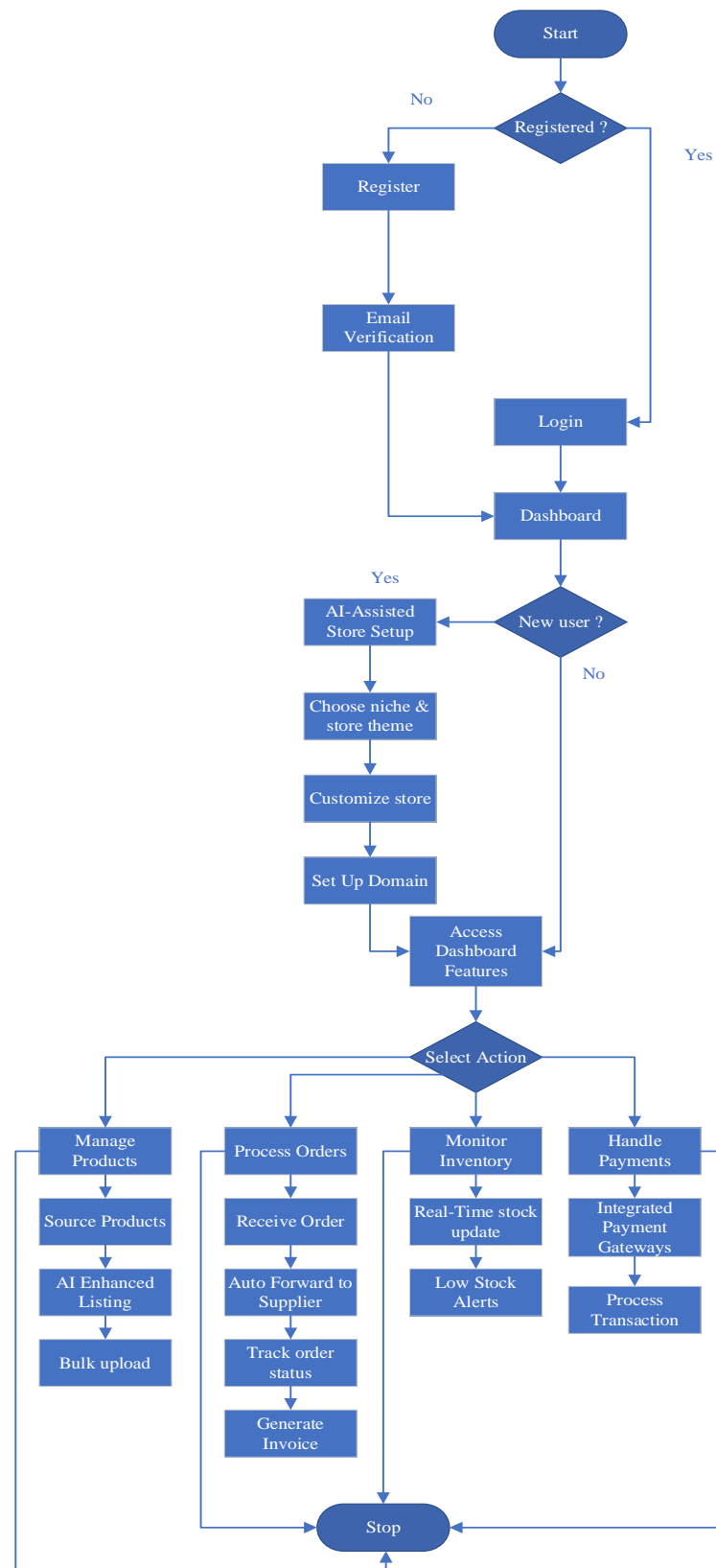## 5.2 Flowchart of Proposed System

Figure1. FlowChartD

5.3 System Architecture

5.3.1 *Data Collection Layer:*

This layer will consist of the web scraping engine responsible for gathering real-time product data from dropshipping websites.

5.3.2 *Business Logic Layer:*

The core functionality resides here, where the order processing system, AI chatbot operate.

5.3.3 *API and Integration Layer:*

This layer will handle communication with external e-commerce platforms, supplier APIs, and third-party services.

5.3.4 *User Interface Layer:*

The front-end interface will allow users to interact with the platform, view real-time product data, manage orders, and analyze business performance.
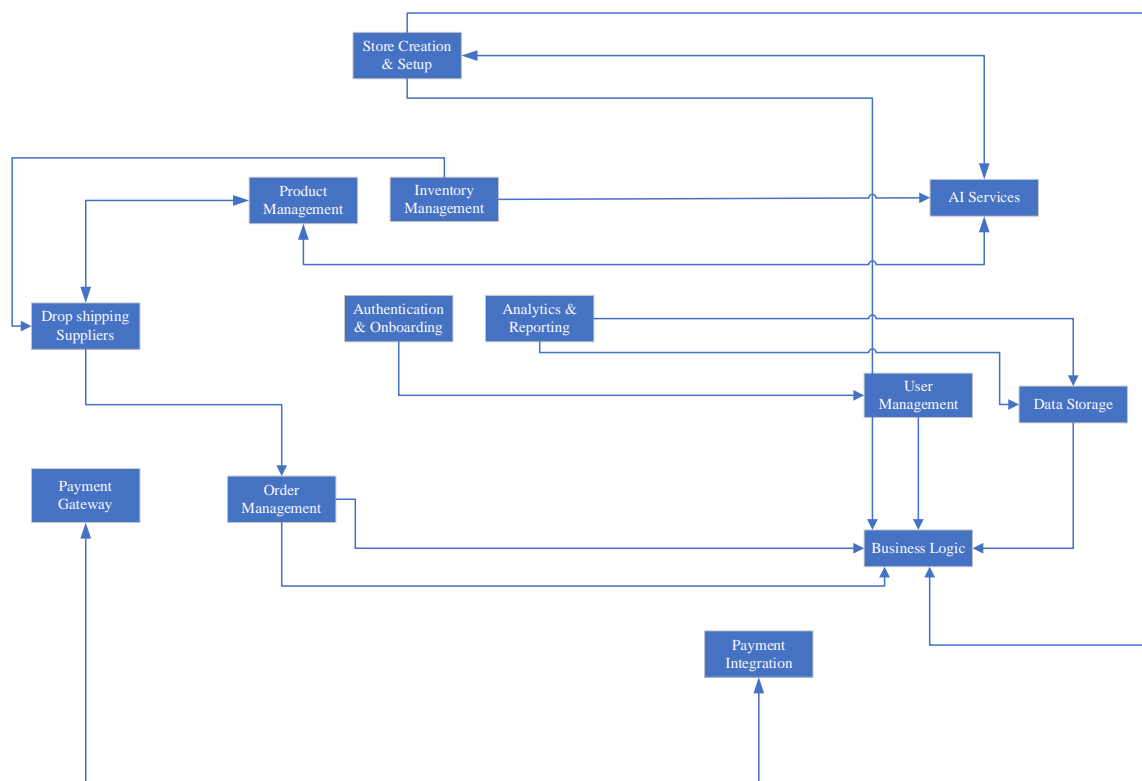
5.4 Block Diagram of System Components

Figure2. BlockDaigram

6 Individual Tasks :

Team Member	Activity	Description	Tentative Date
Abdul Hanan	Project Planning	Initial planning, organizing project tasks, and defining overall objectives.	01-Oct-2024
	UI/UX Design	Designing user-friendly and visually appealing interfaces for the website and mobile app.	01-Nov-2024
	System Architecture	Outlining the technical structure and specifications for both frontend and backend components.	15-Nov-2024
	Frontend Development	Developing the frontend for both the web and mobile applications, ensuring responsiveness.	01-Dec-2024
	Backend Development	Building core backend functionalities, including database integration and API setups.	01-Jan-2025
	AI Model Integration	Integrating AI models for the chatbot and real-time data synchronization.	01-Mar-2025
	Unit Testing	Testing individual modules and components to validate their functionality.	01-Apr-2025
	Documentation - System Architecture	Documenting the system architecture, outlining all major components and their interactions.	01-Mar-2025
	Post-Deployment Support	Providing support and maintenance after deployment, addressing any issues that arise.	15-May-2025
Yahya Irfan	Project Planning	Collaborating on initial project planning and defining core milestones.	01-Oct-2024
	Requirements Gathering	Collecting and analyzing project requirements to align with stakeholder expectations.	15-Oct-2024
	Web Scraping Module	Developing advanced data extraction techniques for real-time product updates from supplier sites.	01-Dec-2024
	Backend Development	Assisting in backend development, focusing on data synchronization, inventory, and order automation.	01-Jan-2025
	Integration Testing	Testing interactions between different modules, ensuring seamless integration of web scraping, AI, etc.	01-Apr-2025
	Documentation - Data Extraction Module	Writing documentation for the data extraction module, detailing algorithms and data syncing processes.	01-Mar-2025
	User Acceptance Testing	Performing user testing to confirm that the system meets user requirements before deployment.	15-Apr-2025
	Feedback Collection & Analysis	Gathering feedback from users post-deployment to identify areas for improvement.	01-Jun-2025
Bushra Hasan	Project Planning	Contributing to project planning and task distribution within the team.	01-Oct-2024
	Requirement Engineering	Documenting detailed technical and functional requirements for all system modules.	15-Oct-2024
	UI/UX Design Support	Assisting with responsive design for the store website and mobile app, ensuring optimal user experience.	01-Nov-2024
	Frontend Development	Working on the frontend development, implementing responsive layouts and user-friendly features.	01-Dec-2024
	Deployment	Managing the deployment process, including beta testing and final deployment to a live server.	15-Apr-2025
	Documentation - Frontend & Deployment Process	Documenting frontend design and deployment steps for reproducibility and future reference.	01-May-2025
	Feedback Collection & Analysis	Analyzing user feedback and performance metrics to suggest enhancements and scalability.	01-Jun-2025
All Members	Project Documentation	Collaborative documentation covering setup, usage, system architecture, AI models, and future scalability.	Throughout Project

7 Gantt Chart :

DroPilot Project Timeline
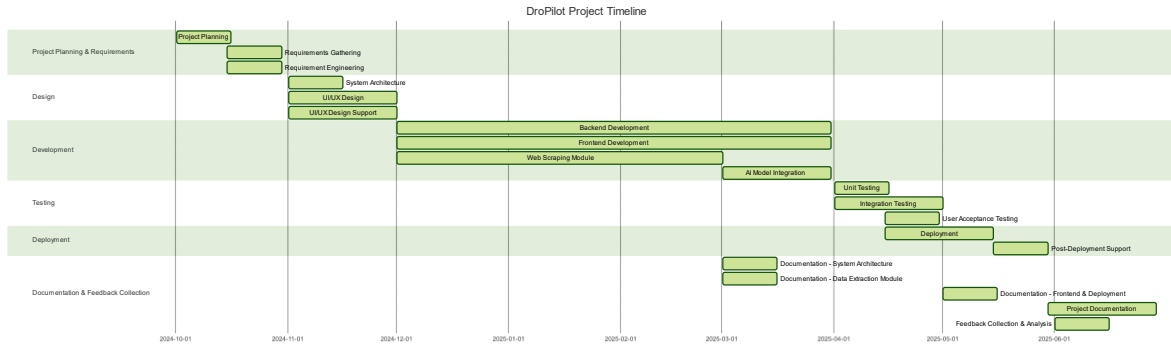
8 Tools and Technologies

8.1 Tools:

- React Js
- Mongodb
- Express Js
- Node Js
- Python
- Visual Studio Code
- Google Colab
- Vercel / Netlify / AWS
- Git and GitHub

8.2 Technologies:

- Web Application
- Artificial Intelligence
- Web Scraping
- Automation
- Natural Language Processing
- OAuth
- Web Hooks
- Application Programming Interface

- Version Control

9 References

[1] "Dropy.ai™ - the future of ai dropshipping," Dropy AI, [Online]. Available: https://www.dropy.ai/. [Accessed 15 September 2024].

[2] "AutoDS the automated dropshipping tool for your store," AutoDS, [Online]. Available: https://www.autods.com/. [Accessed 18 September 2024].

[3] "Glitching AI - the Ultimate AI dropshipping tool," Glitching AI, [Online]. Available: https://www.glitching.ai/. [Accessed 20 September 2024].

[4] "Sell The Trend: AI Dropshipping," Sell The Trend, [Online]. Available: https://www.sellthetrend.com/. [Accessed 22 September 2024].

[5] "AppyPie," [Online]. Available: https://www.appypie.com/. [Accessed 22 September 2024].

[6] "Mobirise," [Online]. Available: https://mobirise.com/. [Accessed 28 September 2024].

Appendix A

DroPilot