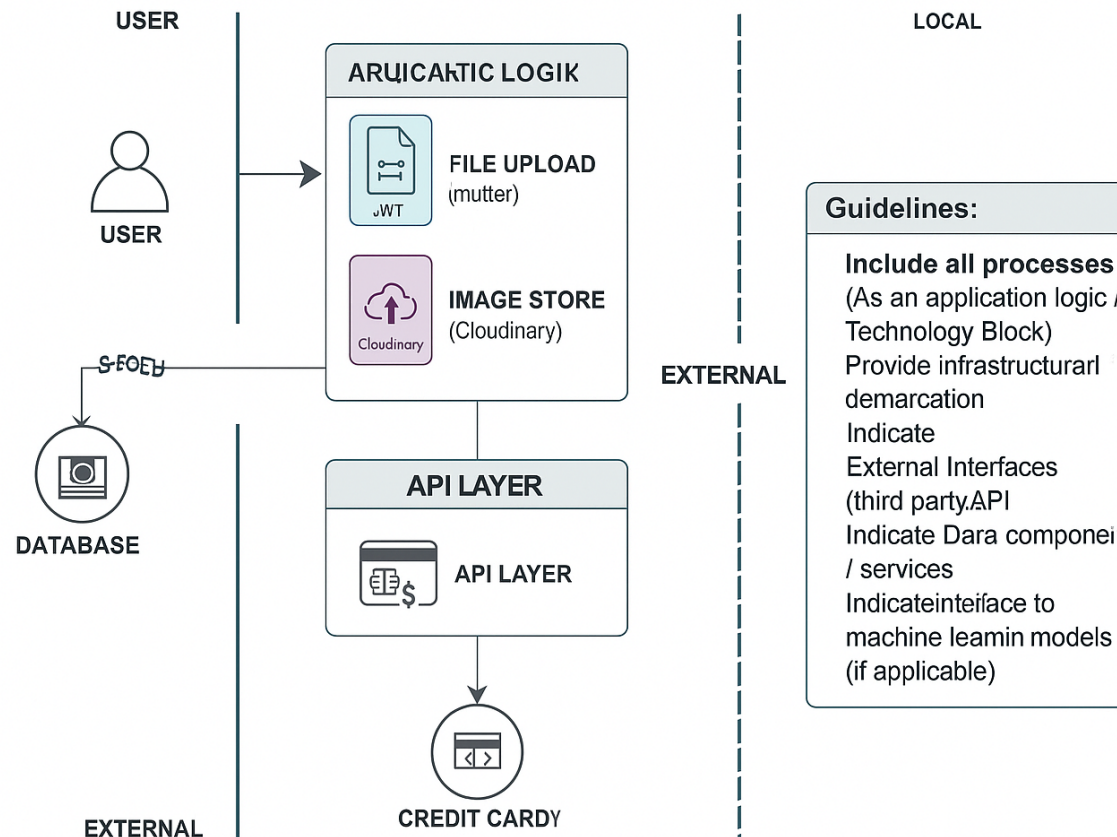


## Project Design Phase-II Technology Stack (Architecture & Stack)

Date	8 AUGUST 2025
Team ID	PNT2025TMID10267
Project Name	Greencart-Grocery Web App
Maximum Marks	4 Marks

### Technical Architecture:



**Table-1 : Components & Technologies:**

S.NO	COMPONENT	DESCRIPTION	TECHNOLOGY
1	User Interface	How user interacts with application (Web UI, Mobile App)	React.js, Tailwind CSS
2	Authentication & Authorization	User login, registration, and access control	Node.js, JWT (JSON Web Tokens)
3	Product Management	Product catalog, inventory, and listing management	Node.js, Express.js
4	Cart & Order Logic	Shopping cart functionality and order processing	Node.js, Express.js
5	Seller Panel	Seller dashboard and product management interface	Node.js, Express.js
6	Database	Product, User, Order, Cart data schemas	MongoDB with Mongoose ODM
7	Media Storage	Image hosting and media file storage	Cloudinary
8	File Upload	Product image upload handling	Multer + Cloudinary
9	Payment Gateway	Online payment processing	Stripe Checkout API
10	Content Delivery	Image hosting and delivery optimization	Cloudinary API
11	Machine Learning	Product recommendation system	To be integrated (Future scope)
12	Deployment Infrastructure	Application hosting and deployment	Vercel (Frontend & Backend)

**Table-2: Application Characteristics:**

S.NO	CHARACTERISTICS	DESCRIPTION	TECHNOLOGY/IMPLEMENTATION
1	Open-Source Frameworks	Modern web development frameworks utilized	React.js, Node.js, Express.js, MongoDB
2	Security Implementations	Security controls and access restrictions	JWT tokens, httpOnly cookies, bcrypt hashing, Helmet.js
3	Scalable Architecture	Three-tier architecture with separation of concerns	MERN stack with modular routing and middleware
4	High Availability	Cloud hosting with redundancy and uptime guarantees	Vercel deployment with global CDN
5	Performance Optimization	Frontend and backend performance enhancements	MongoDB indexing, Cloudinary CDN, lazy loading, caching
6	Cross-Platform Compatibility	Responsive design for multiple devices	Tailwind CSS responsive utilities
7	API Design	RESTful API architecture for clean data exchange	Express.js REST API with JSON responses
8	Data Validation	Input validation and data integrity	Mongoose schema validation, Express validators

**References:**

- [GreenCart GitHub Repository](#)
- [Stripe Documentation](#)
- [Cloudinary Documentation](#)
- [C4 Model: Structurally Visualizing Software Architecture](#)
- [IBM Order Processing System Pattern](#)