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EMPORA: A Smart Mobile Application for Entrepreneur Empowerment Using Artificial Intelligence

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Abstract- EMPORA is an AI-powered business advisory platform designed to provide entrepreneurs and small business owners in India with access to expert guidance across ten critical business domains. The platform integrates artificial intelligence through the Groq LLaMA 3.3-70B language model to deliver personalised advisory services covering fundraising, strategic planning, taxation, land and legal matters, licensing and compliance, loans and finance, risk management, project management, cybersecurity, and business restructuring. The mobile application is developed using Flutter for cross-platform compatibility on Android, iOS, and web. The backend services are built using Node.js and Express.js with a RESTful API architecture. MongoDB Atlas is used for cloud-based data storage and management. Razorpay payment gateway is integrated to support secure membership subscription transactions. An admin approval system controls user access to ensure platform quality. The system provides free access to two modules and membership-based access to all ten advisory modules. EMPORA aims to democratise business advisory services by making expert-level AI guidance affordable and accessible to founders and SMEs across India.

Index Terms - AI Advisory, Business Platform, Flutter, Groq LLaMA, Mobile Application, Node.js, Razorpay, SME, Startup

I. INTRODUCTION

The rapid growth of digital technology has transformed the way businesses access professional advisory services. Entrepreneurs and small business owners in India face a significant challenge: they require expert guidance in multiple domains such as taxation, legal compliance, financial planning, and risk management, but professional consultants remain financially inaccessible to most early-stage founders. According to Sharma and Gupta (2023), nearly 78 percent of Indian startups fail within their first three years, largely due to poor financial planning, legal non-compliance, and lack of strategic guidance.

With the emergence of large language models and conversational AI, it has become possible to deliver expert-level advisory at scale. Research by Rahman and Hossain (2023) highlights that AI-powered platforms can effectively support small businesses by providing intelligent, personalised guidance across multiple service domains through a single integrated system. These advancements create a unique opportunity to develop platforms that make professional business advice accessible to every entrepreneur, regardless of budget.

In recent years, several AI-based platforms have been developed to assist businesses with specific domains such as taxation or legal compliance. Kumar and Patel (2025) demonstrated that AI advisory systems significantly improve decision-making quality for SME founders when the system is trained on domain-specific knowledge and personalised to the user's business context. However, most existing platforms address only one or two domains and do not provide an integrated multi-module advisory experience.

The integration of Groq's LLaMA 3.3-70B large language model into business advisory applications has shown promising results in providing accurate, context-aware guidance. According to Chen and Wang (2024), multi-domain AI assistants that maintain conversational memory and personalise advice based on the user's business profile deliver significantly higher user satisfaction scores than generic chatbot solutions.

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Despite these developments, a comprehensive, affordable, and mobile-first AI business advisory platform tailored to the Indian startup and SME ecosystem does not currently exist. Existing solutions are either too expensive, web-only, or limited to a single advisory domain. As noted by Verma and Singh (2024), the lack of integrated advisory platforms forces entrepreneurs to consult multiple specialists, leading to fragmented guidance and increased costs.

To address these limitations, this research proposes EMPORA: An AI-Powered Multi-Module Business Advisory Platform. EMPORA integrates ten specialised AI advisors within a single cross-platform mobile application, providing founders and SME owners with personalised, context-aware guidance across all critical business domains. The platform is built using Flutter for the mobile interface, Node.js and Express.js for backend services, MongoDB Atlas for data management, and the Groq API for AI-powered advisory. Razorpay is integrated for secure membership subscription processing.

The primary objective of this research is to design, develop, and validate an accessible AI advisory system that reduces the barrier to professional business guidance for entrepreneurs in India. By combining conversational AI with founder profile personalisation, persistent chat memory, and a structured module-based architecture, EMPORA aims to serve as a reliable, always-available business advisor for the next generation of Indian entrepreneurs.

II. SYSTEM DESIGN

2.1 System Flow Diagram

The system flow of EMPORA begins when a user downloads and launches the mobile application. The user is first directed to the registration screen where they provide their name, email, phone number, company name, and password. Upon successful registration, the system creates a new user account with a default status of pending approval. The new user is directed to the Pending Approval Screen, which notifies them that their account requires admin verification before access is granted.

The admin receives a notification of the pending registration and reviews the new user through the Admin Panel. If approved, the user receives an in-app notification confirming account activation. Upon next login, the system checks the approval status and routes the user to the main home screen. Admin accounts bypass the approval check and are routed directly to the Admin Dashboard.

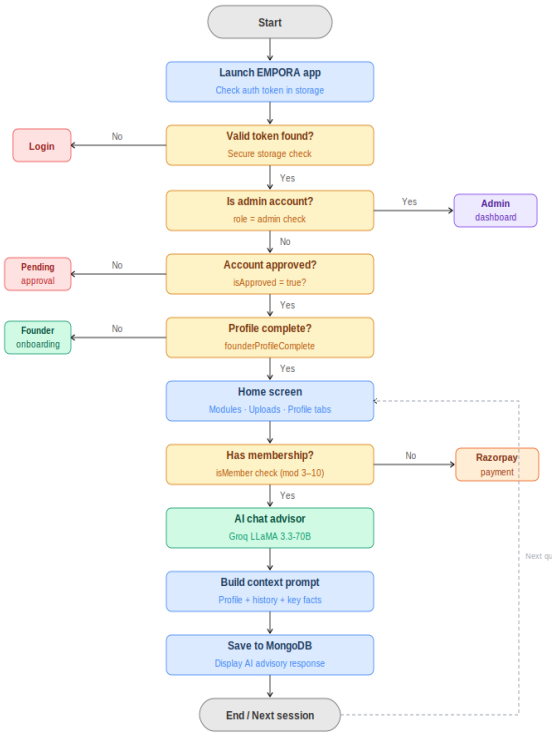

Fig. 1 - EMPORA System Flow Diagram

From the home screen, approved users can access the module dashboard containing all ten advisory modules. Free users have unrestricted access to the Fund Raising and Strategic Planning modules. Access to the remaining eight modules requires an active membership subscription, which can be purchased through the integrated Razorpay payment gateway. Upon successful payment, the user's membership is activated and all ten modules become accessible.

Each module opens a dedicated AI chat interface powered by the Groq LLaMA 3.3-70B model. The AI advisor is personalised using the user's founder profile,

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which includes their industry, business stage, team size, annual revenue, and primary goals. Conversation history is stored in MongoDB per user per module, enabling the AI to maintain context across multiple sessions. Users can also submit documents and files through the Uploads section for admin review and report generation.

2.2 System Architecture Diagram

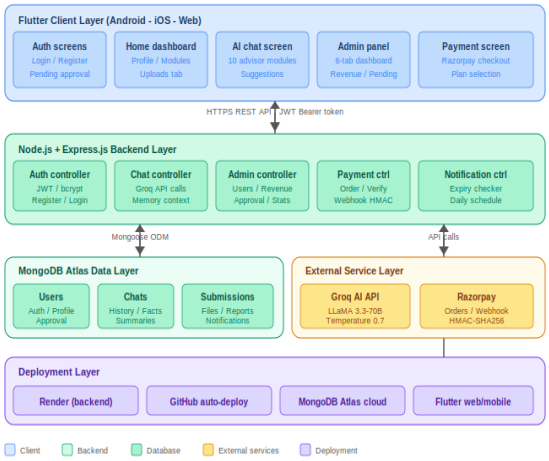

Fig. 2 - EMPORA System Architecture Diagram

The EMPORA system architecture follows a layered client-server design consisting of four primary layers: the Flutter mobile application layer, the Node.js backend API layer, the MongoDB Atlas data layer, and the Groq AI service layer.

The Flutter mobile application serves as the user interface and communicates with the backend through RESTful API calls using HTTP over HTTPS. The backend server, built with Node.js and Express.js, handles all business logic including user authentication with JWT tokens, password hashing with bcryptjs, module access control, admin operations, notification management, and payment processing. The backend connects to MongoDB Atlas for persistent data storage across all collections including users, chats, notifications, submissions, and settings.

For AI advisory services, the backend routes chat requests to the Groq API, appending the user's founder profile and conversation history as context before sending each query. The Groq LLaMA 3.3-70B model processes the contextualised request and returns a domain-specific advisory response. Payment processing is handled through the Razorpay API, with webhook support for real-time payment confirmation. The system is deployed on Render with automatic deployment triggered by GitHub pushes, ensuring continuous delivery.

III. SYSTEM IMPLEMENTATION

The implementation of EMPORA is carried out using a modern full-stack architecture designed for cross-platform mobile and web deployment. The system is developed using Flutter for the mobile application interface, which provides a unified codebase for Android, iOS, and web platforms. Flutter's widget-based architecture enables the construction of responsive and visually consistent user interfaces across all screen sizes and operating systems.

The backend of the system is developed using Node.js and Express.js, which handle all API communication, business logic, and data processing. The backend exposes a comprehensive set of RESTful API endpoints covering authentication, user management, admin operations, AI chat, notification management, payment processing, and file submissions. JSON Web Tokens are used for stateless authentication, ensuring secure and scalable API access without server-side session management.

For data storage, MongoDB Atlas is used as the cloud database service. The database maintains collections for users, chat histories, notifications, submissions, admin settings, and pricing configurations. Each chat collection stores per-user per-module conversation history along with extracted key facts and conversation summaries, enabling the AI to maintain long-term context without exceeding token limits.

The AI advisory functionality is powered by the Groq API using the LLaMA 3.3-70B-Versatile model. Each of the ten modules has a dedicated system prompt that configures the AI as a domain-specific expert advisor. The backend constructs the AI request by combining the module-specific system prompt, the user's founder profile, extracted key facts from previous conversations, and the user's current message. This

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multi-layer context construction ensures that advisory responses are highly personalised and relevant to the user's specific business situation.

The Razorpay payment gateway is integrated for processing membership subscriptions. When a user initiates a payment, the backend creates a Razorpay order and returns the order ID to the Flutter application. The Flutter application then opens the Razorpay checkout interface, where the user completes the payment. Upon successful payment, the signature is verified on the backend using HMAC-SHA256 encryption, and the user's membership status is updated in the database.

IV. METHODOLOGY

1. Main Application Control Flow

The main control flow of the EMPORA platform operates through a structured interaction between the Flutter application, the Node.js backend API, MongoDB Atlas, and the Groq AI service. When the application launches, the system checks for an existing authentication token stored in secure local storage. If a valid token is found, the backend validates it and retrieves the user's profile, including approval status, membership status, and founder profile completion state.

Based on the retrieved profile, the application routes the user to one of four destinations: the Pending Approval Screen for unapproved users, the Admin Dashboard for admin accounts, the Founder Profile Onboarding Screen for users who have not yet completed their profile, or the main Home Screen for fully approved and onboarded users. This routing logic ensures that each user type receives an appropriate experience upon launch.

Within the Home Screen, users navigate through four tabs: Home Dashboard, Modules, Uploads, and Profile. The Home Dashboard displays a personalised greeting, quick statistics, motivational content, and quick access shortcuts to frequently used modules. The Modules tab displays all ten advisory modules with visual differentiation by colour, icon, and domain. Locked modules display an upgrade prompt for free users.

WHILE application_running DO

1.1 Launch EMPORA Mobile Application

1.2 Check authentication token in secure storage

1.3 IF token valid THEN

Fetch user profile from backend

IF user is admin THEN route to Admin Dashboard

ELSE IF user not approved THEN route to Pending Screen

ELSE IF profile incomplete THEN route to Onboarding

ELSE route to Home Screen

1.4 User selects advisory module

1.5 Check membership access

1.6 IF access granted THEN open AI Chat Advisor

1.7 Send message with founder profile context to Groq API

1.8 Display AI advisory response

1.9 Save conversation to MongoDB

END WHILE

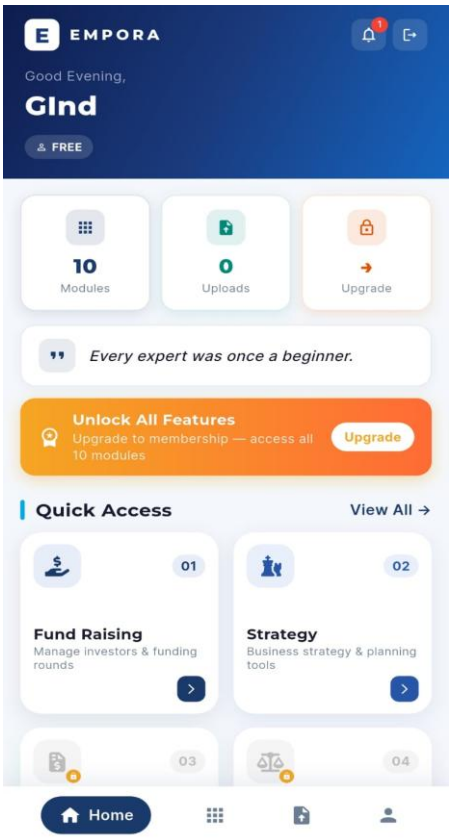

Fig. 3 — Home Screen

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2. AI Chat Advisory Module

The AI Chat Advisory Module is the core feature of EMPORA. When a user opens any of the ten modules, the system loads the user's existing chat history from MongoDB and displays previous messages. The module-specific AdvisorConfig provides the chat interface with the advisor's title, colour theme, welcome greeting, suggested questions, and quick chip options. This configuration ensures that each module has a visually and functionally distinct identity .

When the user submits a message, the Flutter application sends the message along with the user's business profile context to the backend API endpoint at POST /api/chat/:module/message. The backend retrieves the user's stored conversation history, key facts, and context summary from MongoDB.

The Groq LLaMA 3.3-70B model processes the contextualised prompt and returns a domain-expert advisory response. The backend saves both the user message and the AI response to the chat history in MongoDB. Every six messages, the system automatically extracts and updates key facts about the founder's situation using a secondary Groq API call. Every thirty messages, a conversation summary is generated to compress older context and maintain advisory continuity within the model's context window.

IF user_sends_message THEN

2.1 Receive message at POST/api/chat/:module/message

2.2 Load user's chat history and key facts from MongoDB

2.3 Build contextualised prompt:

System prompt (module-specific expert role) + Founder profile (industry, stage, revenue, goals) +Key facts from previous sessions + Recent conversation history (last 20 messages) + Current user message

2.4 Send to Groq LLaMA 3.3-70B API

2.5 Receive AI advisory response

2.6 Save message pair to MongoDB

2.7 IF every 6 messages THEN extract and update key facts

2.8 IF every 30 messages THEN generate context summary

2.9 Return response to Flutter application

END IF

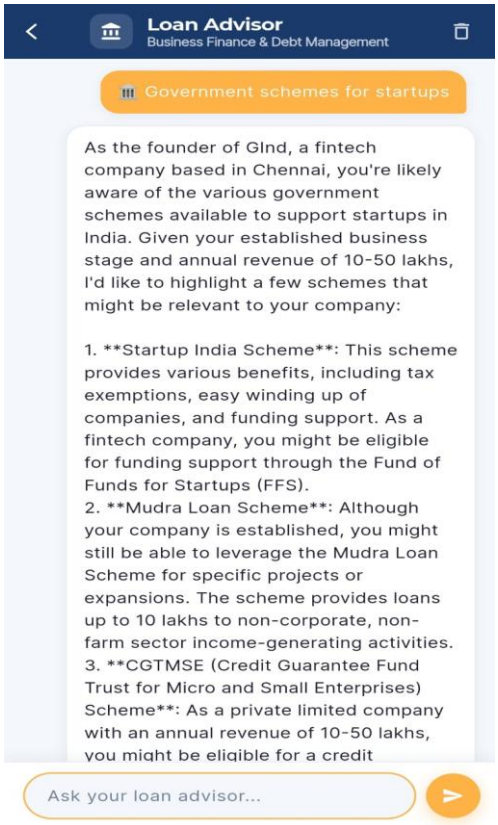

Fig. 4 — AI Chat Advisor Screen

3. User Approval and Membership Module

The user approval system ensures that only verified users can access the EMPORA platform. When a new user registers, their account is created with is Approved set to false. The user is immediately directed to the Pending Approval Screen, which displays a three-step progress indicator showing account creation, admin review, and access granted stages. A timer automatically checks the approval status every thirty seconds by polling the backend profile endpoint.

The admin receives a notification of the new registration and can review the pending user in the Admin Panel under the Pending Approvals tab. Each

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pending user card displays the user's name, email, phone, company, and registration time.

The admin can approve the user with a single tap, which triggers a database update setting isApproved to true and sends an in-app notification to the user. Alternatively, the admin can reject the user with an optional reason, which deletes the account and notifies the user.

IF user_registers THEN

3.1 Create user account with isApproved = false

3.2 Send pending approval notification to user

3.3 Route user to Pending Approval Screen

3.4 Admin reviews pending user in Admin Panel

3.5 IF admin approves THEN

Set isApproved = true in database

Send approval notification to user

User gains access to Home Screen

3.6 ELSE IF admin rejects THEN

Send rejection notification with reason

Delete user account

3.7 Membership upgrade via Razorpay:

Create Razorpay order

Process payment in Flutter

Verify signature with HMAC-SHA256

Set isMember = true, activate all 10 modules

END IF

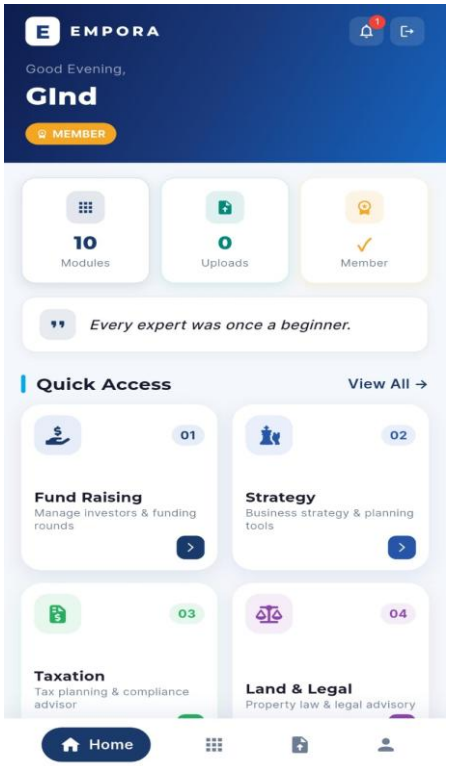

Fig. 5 — Membership

V. RESULT

Testing Methodology

The EMPORA platform was tested using a modular testing approach to ensure that each component of the system functions correctly under realistic user scenarios. The application is structured into modules covering user authentication, admin approval, AI advisory chat, membership payment, notification management, and admin dashboard analytics. Each module was tested individually before integration testing was performed across the complete system.

Unit testing was conducted on individual backend controllers to verify correct handling of registration, login, profile retrieval, chat message processing, payment verification, and notification delivery.

Integration testing confirmed that the Flutter application, Node.js backend, MongoDB Atlas database, Groq API, and Razorpay payment gateway communicate correctly under normal and error conditions. The AI advisory responses were evaluated for domain relevance and personalisation accuracy

using predefined founder profiles across all ten modules.

Functional testing was carried out by simulating complete user journeys from registration through admin approval, founder profile completion, module access, AI advisory interaction, and membership upgrade. The admin panel was tested for accuracy of revenue data, user management operations, submission processing, and pending approval workflows. All major test cases passed.

Table 1 - Test Cases

TC ID	Module	Input	Result	Status
01	Registration	Valid details	Pending screen	Pass
02	Admin	Tap approve	Access + notification	Pass
03	AI Advisory	User query	AI guidance	Pass
04	Payment	Select plan	Activated	Pass
05	Profile	Complete profile	Industry response	Pass
06	Revenue	Open tab	Revenue shown	Pass
07	Notification	3 days before	Warning shown	Pass

VI. CONCLUSION

The EMPORA platform provides a comprehensive AI-powered advisory solution that connects entrepreneurs and SME owners with expert-level business guidance across ten critical domains through a single cross-platform mobile application. The system integrates Flutter for the mobile interface, Node.js and Express.js for backend services, and MongoDB Atlas for data management, ensuring efficient data handling and smooth communication between all system components. The Groq LLaMA 3.3-70B model powers personalised, context-aware AI advisory conversations that adapt to each founder's unique business profile and maintain long-term conversational memory.

The admin approval system ensures platform quality by requiring manual verification of new user registrations before granting access. The Razorpay payment integration provides a secure and seamless membership upgrade experience. The modular architecture separates each advisory domain into an independent, configurable unit, enabling easy extension and maintenance of the platform. The testing results confirm that all major modules including user management, AI advisory, payment processing, and admin operations function correctly and deliver reliable responses.

Overall, EMPORA demonstrates that AI technology, combined with a thoughtfully designed mobile application architecture, can meaningfully reduce the barrier to professional business advisory services for entrepreneurs in India. The platform represents a practical and scalable approach to democratising expert guidance for the next generation of founders and small business owners.

VII. FUTURE ENHANCEMENT

The EMPORA platform can be further enhanced through several planned developments. Future versions may include voice-based AI advisory through speech-to-text integration, enabling founders to consult their advisors hands-free while on the move. The system can be extended with push notifications powered by Firebase Cloud Messaging to deliver proactive advisory tips, compliance deadline reminders, and business milestone alerts.

Multilingual support can be added to serve founders across India's diverse linguistic landscape, with regional language advisory available in Hindi, Tamil, Telugu, and other major languages. The AI advisory system can be enhanced with retrieval-augmented generation to incorporate real-time regulatory updates, tax law changes, and market data into advisory responses. A document analysis feature can allow

users to upload contracts, financial statements, or licence applications and receive AI-powered review and recommendations.

A community feature connecting founders facing similar challenges can be introduced, along with a marketplace for connecting users with verified human advisors for complex matters that require professional certification. These enhancements will further expand EMPORA's capability to serve as a complete business support ecosystem for entrepreneurs across India.

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