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Startup GPS: AI-Powered Startup Idea Validation, Team Building, and Roadmap Generation Platform

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Abstract: Startup GPS is an AI-powered platform designed to guide early-stage entrepreneurs through the toughest parts of starting a company. Many new startups struggle because of gaps in market research, unclear strategy, or not having the right people on the team. Startup GPS simplifies this early journey by giving founders the tools and clarity they need from day one. At the core of the platform is the Groq LLM, which evaluates business ideas, offers market insights and creates personalized action plans, without need for complicated NLP setups.

To help founders build stronger teams, Startup GPS includes a skill-based matching system that connects users with potential members whose strengths complement the project's needs. The platform also features a Research Finder that pulls relevant academic papers from sources like arXiv, crossref and Semantic Scholar. This allows users to dig deeper into technical knowledge, validate ideas and stay aligned with the latest research trends. By combining idea validation, trend analysis, Team Building and guided strategic planning in one place, Startup GPS removes many of the early barriers founders face. It acts as practical, always available companion for both solo founders and startup teams providing direction, clarity and confidence throughout the entire building process.

Keywords: AI Powered entrepreneurship, Startup Idea Validation, Personalized startup Roadmaps, real time market insights

I. INTRODUCTION

Starting a company is exciting, but the early stages are often overwhelming-especially for the first time founders who must validate their ideas, understand the market, find the right teammates, and access reliable information. With nearly 90% of startups failing in their first few years, many founders struggle because traditional support-consultants, mentors or manual research-is expensive, slow, and spread across different platforms. Research shows that AI can help in several parts of this journey. Some studies demonstrate that machine learning models can evaluate startup ideas by analysing factors like demand, customer base, and feasibility. Other work shows that clustering and neural networks can predict potential outcomes by learning from real startup data. Meanwhile, behavioural studies highlight the founders are more likely to use AI tools when they are simple, trustworthy, and useful for tasks like matchmaking. The AI-Based Financial Law Analyser and Collaborator aims to address these challenges by offering intelligent, AI-driven solutions for the analysis, interpretation, and resolution of financial legal matters. This digital platform leverages automation to simplify the complexity of financial law and facilitates connections between users and the most suitable legal professionals, thus empowering them with better clarity and assurance before proceedings

Startup GPS brings this research insights together into one unified system. Inspired by idea-evaluation studies, it uses LLMS to help founders assess the strength of their concept. Building on work in predictive modelling, it offers guidance on market position and potential risks[2]. Drawing from research on user adoption and matchmaking, it includes skill-based team building module so founders can find the collaborators they need [4]. In addition, recognizing the importance of informed decision making, the system provides quick access to academic research through external APIs. Finally, Startup GPS introduces a personalized roadmap feature that converts these insights about the founder's idea, market , and team-into a structured, step-by-step plan. This roadmap outlines key phases-such as market research, team requirements, and MVP planning—each with recommended actions, milestones, and expected timeframes, giving founders a clear sense of direction based on their stage and goals. By bringing these elements together, Startup GPS offers a unified system that reduces barriers in early stages of entrepreneurship and offers help to students, entrepreneurs and new founders in making clear and confident decisions. It simplifies complex tasks, reduce uncertainty, and helps entrepreneurs move forward with great clarity and confidence.

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II. RELEVANT LITERATURE

A. Startup Idea Validation using Machine Learning:

Many founders rush into building products without checking whether the idea truly solves a real problem, which often leads to failure. To address this the authors introduce a machine learning platform that helps automate the idea validation process. The system uses Linear Regression and Support Vector Regression to evaluate more than 50 factors such as market demand, customer base, uniqueness, pricing, founder experience and funding needs.

Once the user enters their startup idea details, the platform generates a validation score and provides clear feedback on what looks promising and what may require improvement. Because the system is web-based, It is easily accessible to students and early stage entrepreneurs who may not have access to expert advice. What makes this work important is its ability to mimic expert judgment using AI, giving founders a data-backed understanding of how strong their idea really is before they invest more time and money[2].

B. Startup Success and Failure Prediction using k-Means clustering and Artificial Neural Networks:

Knowing whether a startup has the potential to succeed or fail is extremely valuable, yet difficult to predict. This study proposes a hybrid model that combines a modified version of Kmeans clustering with an Artificial Neural Network to forecast four possible outcomes: success, failure, acquisition, or IPO. The researchers use real time startup data from Crunchbase and apply an extensive preprocessing method that merges company information with funding data to improve reliability.

A key Improvement in this work is replacing the usual Euclidean distance in K-means with an RBF kernel, which handles complex and uncertain data much better. After grouping similar startups together, the ANN learns patterns from the clusters and predict outcomes with an accuracy of up to 89% . The model gives both founders and investors a clearer picture of where a startup stands and what risk may be ahead helping them to make better decisions based on data rather than intuition [3].

C. Enhancing Startup MatchMaking through Machine Learning

Finding the right Co-founder or collaborator is often one of the biggest challenges in Startup Journey. This study explores how machine learning can improve matchmaking by understanding what makes entrepreneurs willing to use AI powered platforms. Using TAM and UTAUT2 frameworks, the authors analyze factors such as usefulness, ease of use, social influence and availability of support.

The data collected from aspirin entrepreneurs and analyzed using Smart PLS shows that people are more likely to trust and adopt a platform when it is simple to use clearly beneficial and supported by a helpful community Social pressure also meant us when others in the ecosystem use and recommend that tool adoption increases this study highlights that even if the back end intelligence is strong users will not engage unless the platform feels trustworthy and easy to navigate this balance between technical capability and user comfort is key to building matchmaking platforms that can genuinely help founders connect with right people[4].

D. Gap in Existing Literature

Most tools either validate ideas, analyze data, or provide networking none offer a complete, integrated solution. Startup GPS uniquely combines idea validation, research support, team building and strategic Roadmaps in one unified system.

III. SYSTEM DESIGN

The Startup GPS platform follows a simple yet intelligent flow that helps entrepreneurs move from just having an idea to building a clear structured path for launching this startup. Each component works together to make the early stages of entrepreneurship easier, more informed, and more confident.

Fig 1 illustrates the layered system architecture of startup gps platform showing how data flows from user interface to the backend services and integrated data sources. The architecture is organised into four primary layers: Presentation, Feature, Application, and Data Integration.

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System Architecture of Startup GPS Platform

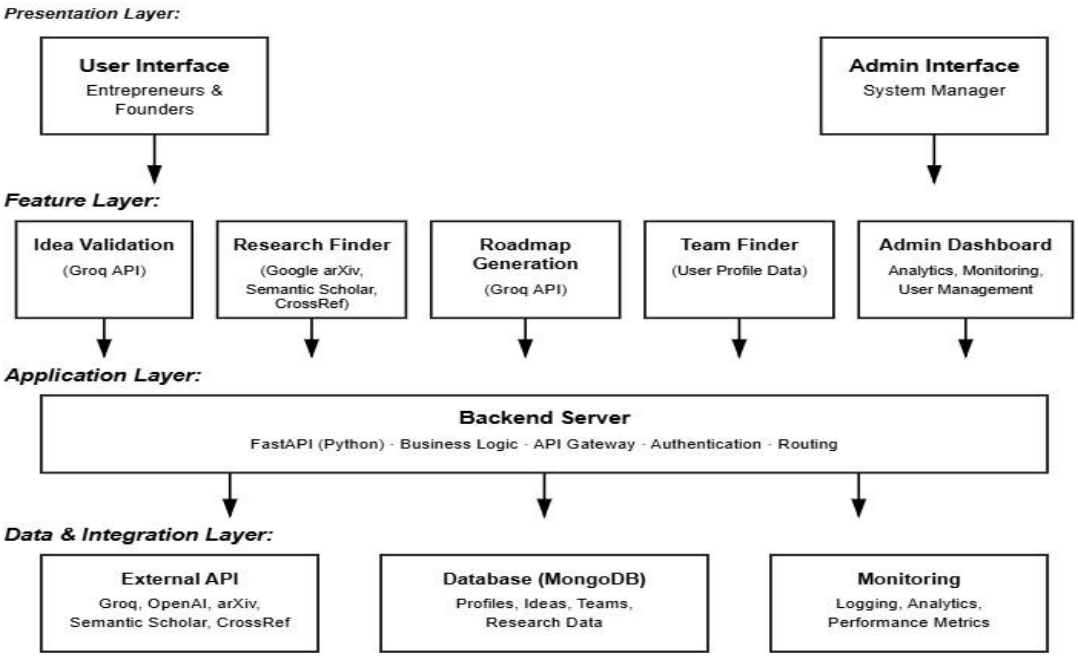

Fig 1. System architecture diagram

A. Presentation Layer:

This layer provides entry point for all users

1. **User interface:** Designed for entrepreneurs and founders it allows them to submit ideas search research papers find potential team members and generate road maps.
2. **Admin interface:** Enable system managers to monitor the platform manage user activity and oversee Analytics. And provides meaningful insights to refine the concept

B. Feature Layer:

This is the layer where all core functional models operate each feature works independently it communicates seamlessly with the rest of the system

1. **Idea Validation:** Powered by Groq LLM, this module analyzes user-submitted ideas, identifies strengths and weaknesses and provides meaningful insights to refine the concept.
2. **Research Finder:** This component connects with external academic sources such as Crossref, arXiv, and Semantics Scholar to gather relevant papers. It helps users explore existing research, understanding similar approaches, and identify innovation opportunities
3. **Roadmap Generation**: Using Groq LLM the system creates a personalized roadmap based on the user's idea and selected timeframe. It breaks down the startup journey into phases like research, prototyping, MVP development, launch and scalability
4. **Team Finder:** Matches users with potential team members or collaborators by analyzing skill, compatibility, experience, and goals. This reduces the difficulty of finding the right team member
5. **Admin Dashboard:** Offers analytics, monitoring tools, and user management features for administrators to oversee platform activity, maintain data quality, and ensure smooth operations.

This layer delivers the intelligent, user-facing functions that make Startup GPS an all-in-one platform for early entrepreneurs.

C. Application Layer: At the core of the architecture is the Backend Server, built using FastApi python.

This layer acts as the command centre of the entire platform handling.

1. Business logic and workflow rules
2. Authentication, authorization and security user access
3. API routing and request handling
4. communication between frontend interface, functional modules and external data sources
5. Integration with Groq and research APIs

By centralizing these operations the backend ensures that the system is fast scalable and capable of processing real time request efficiently.

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D. Data & Integration Layer: This layer manages all data operations and external system interactions that supports the platform's intelligent features**:**

1. **External Apis:** Groq LLM, Crossref, Semantic Scholar Supply real-time insights, research data and idea-analysis results.
2. **Database (Mongodb):** Stores user profiles, startup ideas, co-founder match data, roadmap content, and retrieved research information. It enables persistent data access and smooth user sessions.

This layer forms the backbone of the platform enabling smooth data flow and reliable integration with all required external systems.

IV. METHODOLOGY

A. Smart Idea Check

When users describe their startup idea in their own words the Groq LLM reads this description and evaluates how clear, practical and well defined the idea is . It identifies what makes sense what might need to be improved and what potential risks could arise. Because Grok LLM doesn't rely on heavy custom NLP pipelines it can understand ideas in different forms of natural language and provide context-aware, meaningful feedback. This ensures founder starts with a polished and well structured concept.

B. Market Trends and Competitor Insights

Once the idea is understood, the system checks what is happening outside in the real world. It pulls real-time information from APIs and trusted online sources to show current trends, customer interest, and competitors working in the same space. This helps users avoid building something the market doesn't need. Instead they get a realistic picture of demand, opportunities, and challenges before investing time or money

C. Feasibility Assessment

After understanding the idea and the market, Startup GPS evaluates whether the concept can realistically succeed. This step is about really getting to know your idea how much people might actually want it , what makes it stand out how realistic it is to build, the risks you might run into, and who else is already doing something similar. Taking time to explore these area gives founders a clear picture of where their idea truly stands and what needs a little polishing before taking this next step.

D. Skill-Based Team Building

Building a startup is difficult alone and finding the right partner or team member is often a major challenge. The platform helps by allowing users to specify what skills they need in a team member like technical, marketing ,business, or creative. Using a compatibility scoring system startup GPS compares available profiles and suggest people who share similar goals, values, required skills and experience. This makes team formation easier and more reliable, reducing the guesswork involved in finding trustworthy collaborators.

E. Research Finder

To support deeper understanding and innovation the platform includes a research Finder that gathers relevant academic papers from sources like: arXiv, Crossref ,Semantic Scholar .This helps users explore existing solutions, understand past approaches, and identify gaps that their idea can fill. It ensures decisions are based not just on intuition but on verified research and global knowledge.

F. Roadmap Generation

Once all assessments are done startup GPS creates a personalized road map tailored to the user's idea, skills, market fit, and goals. The RoadMap Generation module helps founders to turn their ideas into a clear time bound plan they can actually follow. When user submits their idea and choose a preferred time frame the system creates a customized roadmap that fits within the duration. The timeframe determines how many phases the road map will have, ensuring the plan is realistic and easy to manage.

Each phase includes three key elements: what needs to be done, which outlines the main task to focus on; how to do it, which provides clear, detailed steps to follow; and the potential challenges or risk that might come up along the way. Together, these phases guide founders through the entire early startup journey - from researching the problem to creating prototypes to building an MVP, and eventually preparing for launch and scalability

V. RESULTS AND DISCUSSION

This Startup GPS platform delivers a range of practical benefits designed to support entrepreneurs during the earliest and most critical stages of building a startup.

A. Clearer Idea Understanding and Meaningful Feedback

The platform helps users refine their ideas by offering clear structured feedback. It highlights what is strong in the idea, how relevant it is to the market, and what parts need improvement. The built-in smart input validation ensures that even incomplete ideas are polished before moving forward allowing founders to begin with a solid and well-defined concept.

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B. Stronger Teams Through Skill-Based Matching

Finding the right team member can be challenging. The system simplifies this by matching team members or individuals who have the skills, experience and goals that best complement their startup. This leads to better team alignment, stronger collaboration, and a more stable foundation for business.

C. Decisions Backed by Reliable Research

With access to academic resources from arXiv, Crossref, and Semantic Scholar, users can explore relevant research related to their idea or industry. This reduces guesswork and ensures decisions are grounded in proven information rather than assumptions giving founders more confidence as they move forward.

D. A Clear ,Step-by-Step Roadmap

The platform's roadmap generator organizes this entire startup journey into a simple easy-to-follow phases. Each phase outlines key tasks, how to execute them, and possible challenges to expect. This gives founders a structured plan covering research, prototype building, MVP development, launch stages and growth strategies, helping them stay focused and avoid common early-stage confusion.

E. A Unified Platform for the Entire Startup Journey

Many existing tools focus on only one feature such as Validating ideas or Team Building. Startup GPS brings all essential functions together in one place users can validate ideas, study trends, find team members, access research, and generate a full road map, without switching platforms making the process smoother and more efficient.

F. Lower Risk of Early Startup Failure

By addressing the main reason startups struggle: lack of market fit, poor planning, and weak Team Formation, the platform helps reduce risk in early stages. The guidance provided makes it easier for founders to avoid common mistakes and build a more sustainable startup.

G. Saves Time and Reduces Early Costs

The platform speeds up many time consuming tasks such as market research, feasibility analysis, and planning. This helps founders make faster, more informed decisions, while limiting unnecessary early expenses. Especially useful for people with limited resources

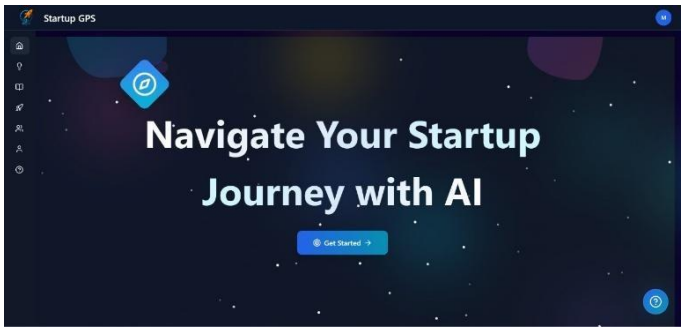

Fig 2. Startup GPS Home page

Fig 3. Idea Validation

VI. CONCLUSION AND FUTURE WORK

Startup GPS presents a unified AI-driven platform designed to support aspiring entrepreneurs throughout the early stages of building a startup. By integrating idea validation, market trend analysis, Feasibility assessment, team building, personalized roadmap generation, Research finder ,the system addresses the major challenges identified in the report: unclear direction, limited research capabilities, difficulty in building a team, and a lack of structured guidance.

The platform's use of Groq LLM enables intelligent idea understanding and meaningful feedback without requiring users to have a technical expertise. Real time market insights combined with feasibility mapping and competitor analysis helps founders make grounded and informed decisions. The skill-based team building system promotes the creation of stronger more compatible teams and the integrated research finder ensures that users have direct access to relevant academic knowledge reducing guesswork.

To further enhance the effectiveness and reach of Startup GPS, several meaningful improvements can be explored. One promising direction is a funding recommendation system that analyses startup's stage, domain, and validation results to suggest suitable grants, incubators, seed investors, or venture capital opportunities. Market research capabilities can also be expanded with advanced analytics- such as sentiment analysis, geo-market performance, pricing comparisons, and predictive trend modelling- to offer users deeper competitive intelligence. Building a mobile application version would greatly improve accessibility, especially for students, first time founders and users in emerging markets are lining with

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the platforms goal of being widely available. Additionally integrating community features, such as discussion forums or mentor-matching tools can foster collaboration, peer feedback.

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