

STARTUP PILOT – GUIDING TEAMS

FROM CHAOS TO CLARITY

*Project report submitted to Shri Ramdeobaba College of Engineering & Management,
Nagpur in partial fulfillment of requirement for the award of
degree of*

HONORS

In

COMPUTER SCIENCE AND ENGINEERING

By

Vedika Jaipurkar - Computer Science and Engineering

**Anshdeep Singh Bhandari – Computer Science
and Engineering**

Guide

Prof. Vishwas Bhagwat



RCOEM

The logo consists of the letters "RCOEM" in a bold, orange, sans-serif font.

**Shri Ramdeobaba College of
Engineering and Management, Nagpur**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
Shri Ramdeobaba College of Engineering & Management, Nagpur
440013

(An Autonomous Institute affiliated to Rashtrasant Tukadoji Maharaj Nagpur University Nagpur)

2025 - 2026

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COMPUTER SCIENCE AND ENGINEERING

This is to certify that the Thesis on "**Startup Pilot – Guiding Teams from Chaos to Clarity**" is a bonafide work of Vedika Jaipurkar, Anshdeep Singh Bhandari of **Computer Science and Engineering** submitted to the Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur in partial fulfillment of the award of a Honors has been carried out at **Computer Science and Engineering**, Shri Ramdeobaba College of Engineering and Management, Nagpur during the academic year 2025-2026.

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Project Guide

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DECLARATION

We hereby declare that the project report titled "**Startup Pilot – Guiding Teams from Chaos to Clarity**" submitted herein, has been carried out in the Department of Computer Science and Engineering of Shri Ramdeobaba College of Engineering and Management, Nagpur. The work is original and has not been submitted earlier as a whole or part for the award of any degree/diploma at this or any other institution / University.

Date:

Place: Nagpur

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Vedika Jaipurkar	Computer Science and Engineering	
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APPROVAL SHEET

This report entitled **Startup Pilot – Guiding Teams from Chaos to Clarity** by Vedika Jaipurkar, Anshdeep Singh Bhandari from department of Computer Science and Engineering is approved for the degree of Honors in Computer Science and Engineering.

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Date:

- Projectees

ABSTRACT

Startup Pilot is a unified digital platform designed to support early-stage startups by providing structured workflow management, investor connectivity, and intelligent guidance through an integrated web-based system. Startups often struggle with unorganized task distribution, unclear team roles, and fragmented communication, leading to inefficiencies, missed deadlines, and challenges in strategic planning. The proposed system addresses these issues by offering a centralized environment where users can create startups, manage projects, assign tasks, monitor progress, and collaborate through an intuitive and user-friendly interface.

The platform incorporates three major modules: a Project & Task Management System that organizes work through a hierarchical structure of startups, projects, and tasks; an Investor Network Module that enables startups to explore potential investors and initiate contact seamlessly; and an AI-powered guidance component designed using Retrieval-Augmented Generation (RAG) principles to provide personalized recommendations for future growth. Built using React, Node.js, MongoDB, and modern CI/CD practices, the system ensures scalability, maintainability, and efficient performance across all modules.

Comprehensive evaluation highlights the system's strength in usability, clarity of design, and ease of navigation, making it accessible for both technical and non-technical founders. The platform's structure promotes better team coordination, reduces operational ambiguity, and provides a streamlined environment for early-stage entrepreneurial activities. With future integration of advanced AI insights, automated workflows, and mobile accessibility, Startup Pilot is positioned as a comprehensive ecosystem tool that enhances productivity, improves investor outreach, and supports better decision-making. By bringing coherence to early-stage operations, the system contributes meaningfully to the growth, sustainability, and long-term success of emerging startups.

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CHAPTER 1

INTRODUCTION

1.1 Problem Definition

Startup Pilot aims to address the difficulty early-stage startups face in evaluating the feasibility and scalability of their business ideas. Many founders struggle with validating market demand, estimating costs, identifying risks, and selecting appropriate business models. The system provides an intelligent, structured, and automated assessment to support data-driven decision-making for startup planning and development.

1.2 Brief Introduction

Early-stage startups often face challenges in maintaining structured workflow, organizing tasks, setting priorities, and ensuring effective collaboration within the team. Without a centralized system, teams may experience miscommunication, unclear responsibilities, missed deadlines, and difficulty in aligning strategic goals. To address these challenges, Startup Pilot is designed as an integrated web-based platform that provides startup teams with a streamlined environment for project execution and collaboration.

Startup Pilot serves as an end-to-end management solution that connects startups, projects, tasks, AI assistance, and investors within a unified ecosystem. It incorporates intelligent features such as AI-based suggestions, automated reminders, and smart insights to enhance productivity and decision-making. In addition, the platform facilitates investor connectivity, enabling startups to showcase their progress and attract potential funding. The system ultimately aims to improve planning, communication, workflow alignment, and team efficiency across the startup lifecycle.

1.3 Objectives

1. To develop a web-based task and collaboration platform specifically designed for early-stage startups.
2. To enable seamless creation, assignment, and tracking of tasks across teams.
3. To incorporate AI-driven insights for reminders, suggestions, and strategic guidance.

4. To ensure transparent communication through role-based access and team-wide visibility.
5. To establish an intelligent connection layer between startups and potential investors.
6. To provide structured workflow management through a hierarchy of Startups → Projects → Tasks.
7. To enhance productivity using built-in dashboards, progress tracking, and planning tools.

1.4 Applications

- **Entrepreneurship Guidance:** Helps new founders evaluate business ideas before investing time and capital.
- **Incubators and Accelerators:** Assists screening and early-stage assessment of startup applications.
- **Market Research Teams:** Provides structured insights on market potential, risk factors, and competitive landscape.
- **Business Consultants:** Acts as a supplementary tool for quick feasibility checks and strategic recommendations.

1.5 Block Diagram

The development workflow of Startup Pilot follows a structured and iterative approach designed to ensure clarity, scalability, and user-centric functionality. The platform begins with detailed requirement gathering and UI planning, which lays the foundation for a clean, intuitive interface suitable for both technical and non-technical startup teams. This is followed by systematic frontend and backend development, ensuring that the core modules—task management, team collaboration, reminders, and AI-driven assistance—integrate seamlessly to support streamlined project operations.

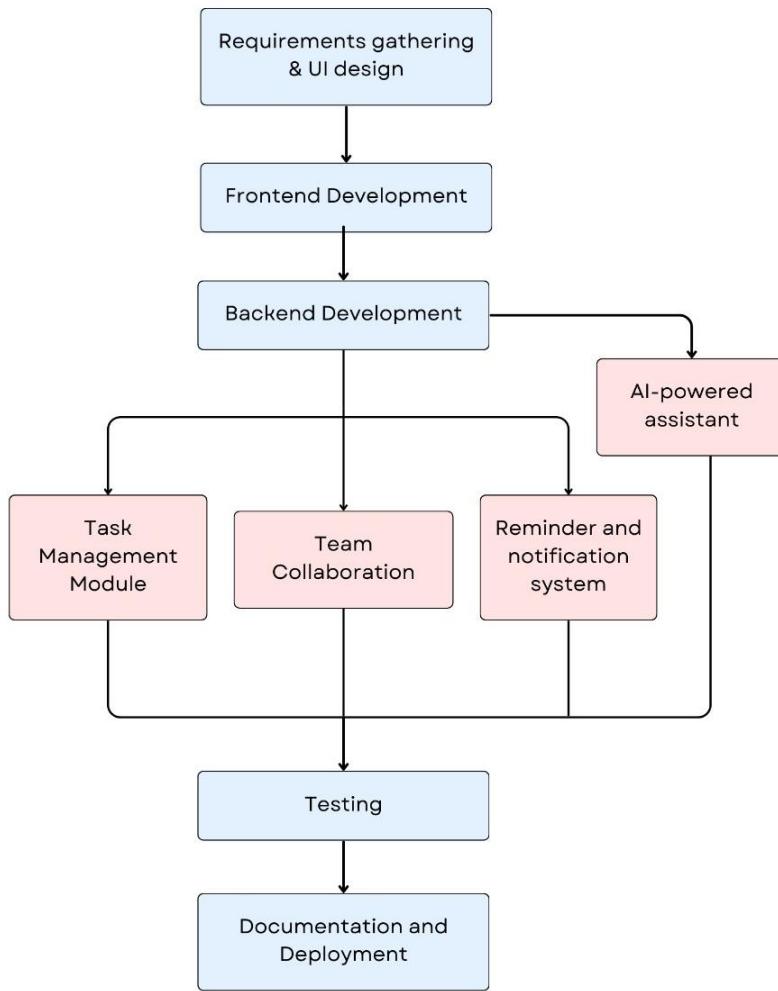


Fig 1.1 Block Diagram

As shown in the block diagram, each module contributes to building a cohesive ecosystem where startups can manage their workflows, track progress, collaborate effectively, and receive intelligent support within a unified platform. The structured process culminates in rigorous testing and final deployment, ensuring that Startup Pilot delivers a smooth, reliable, and user-friendly experience. This comprehensive development flow reflects the platform's objective: simplifying startup management by combining essential features into one well-organized and efficient system.

CHAPTER 2

REVIEW AND LITERATURE

2.1 Literature Review

Startup ecosystems across the world have undergone rapid evolution driven by digital transformation, technological innovation, and increased access to entrepreneurial infrastructure. Early research shows that startups typically operate in environments characterized by uncertainty, limited resources, and high volatility. Studies suggest that the majority of startup failures occur not due to poor technology, but due to gaps in planning, weak management structures, and inadequate knowledge-sharing mechanisms within teams [1][2]. As digital markets expanded, online platforms, collaboration tools, and knowledge systems began playing a central role in shaping how entrepreneurs plan, manage, and execute their ventures.

Recent empirical studies highlight that startups often lack structured processes for managing tasks, tracking progress, and coordinating cross-functional work - all of which are essential for survival in competitive markets [1][2]. To address this, project management methodologies have become foundational elements in modern startup operations. Agile methodologies, in particular, emphasize iterative development, continuous feedback, and customer-centricity. As Ostern (2018) demonstrates, agile practices lead to greater team cohesion, improved customer involvement, and better adaptability when compared to traditional approaches [3]. This has encouraged many early-stage ventures to adopt digital PM tools that support agile workflows.

Software platforms like Jira, Trello, and Asana have emerged as essential tools for enabling structured project workflows. Kamila & Marzuq (2024) conducted a comparative analysis of Asana and Trello, showing that Asana is better suited for larger, multi-tiered agile projects due to its comprehensive hierarchy and automation features, whereas Trello's Kanban-style simplicity fits small task lists and early-stage teams [7]. These platforms help startups break down work into tasks, visualize stages (e.g., to-do, in progress, done), assign responsibilities, track progress, set deadlines, and maintain documentation - mechanisms proven crucial for early organizational clarity [3][7].

Alongside agile methods, structured planning techniques have also gained traction in entrepreneurship research. Khan et al. (2023) apply formal analytical techniques such as CPM, PERT, and fuzzy logic to evaluate the feasibility of a smartphone-based startup project, e-Karsaz. Their fuzzy PERT approach predicted timelines and identified uncertainties, helping founders validate viability and secure seed investment (with a strong internal rate of return of approx. 92%) [1]. This evidence confirms that startups benefit significantly from planning tools that quantify risks, budget needs, and development time - thereby improving investor confidence and execution accuracy.

Knowledge management (KM) also plays a vital role in startup growth. Since startups operate with fluid teams and fast-changing goals, structured KM ensures that insights, processes, and documents are preserved even when employees change roles or leave the company. Centobelli et al. (2017) emphasize that startups must leverage intangible assets - knowledge, documentation, and human capital - to achieve scalability and competitiveness [2]. Their review highlights the lack of integrated digital tools that combine project management, knowledge capture, and team collaboration into one ecosystem. Without such systems, many teams lose critical information, repeat mistakes, and fail to maintain strategic focus.

Parallel to workflow and knowledge management research, the role of artificial intelligence in entrepreneurship has expanded significantly. Li et al. (2025) show that generative AI helps founders reduce information asymmetry - a major early-stage challenge where founders lack clarity about markets, competition, and customer needs [5]. AI systems provide contextual knowledge, produce creative ideas, and generate business insights that support decision-making. Similar findings are presented by Rezazadeh et al. (2025), whose interviews with European and American startups reveal that large language models accelerate tasks such as content creation, customer communication, and market research - boosting marketing efficiency and growth strategies [6]. These studies collectively show that AI has become an integral resource for modern startups.

For startups relying on digital tools for collaboration, customer acquisition, and project execution, platform-based ecosystems play a critical role. Prior studies highlight how digital platforms lower entry barriers, streamline information flows, and enhance the visibility of early-stage ventures [8]. Platforms such as AngelList, Kickstarter, and LinkedIn enable

founders to showcase products, connect with customers, attract investors, and collaborate globally. However, the literature points out challenges like fragmented tools, limited integration across platforms, and lack of personalized guidance - factors that contribute to mismanagement and poor coordination within teams [8].

Taken together, early research across these themes points to a consistent conclusion: Startups need integrated systems - combining project management, collaboration, knowledge management, investor discovery, and AI-powered insights - to succeed in highly dynamic environments.

Building on the central role of project management tools in entrepreneurial environments, research continues to show that digital task-tracking platforms not only support workflow structure but also influence how teams collaborate and communicate. Kamila & Marzuq (2024), in their comparison of Asana and Trello, emphasize that tool effectiveness depends on the scale and context of the project: Asana's hierarchical structure, automation features, and detailed progress tracking fit medium-to-large startup teams, whereas Trello's minimalist Kanban design best supports smaller teams and early-stage task organization [7]. Beyond these two, more recent studies explore how Jira - originally designed for software teams - is being successfully adopted beyond IT. A study in the machine industry shows that Jira's configurable workflows, dashboards, and Agile support significantly optimize operations, enhance reporting, and reduce inefficiencies across domains previously dependent on manual tracking [12]. This evidence reflects a broader shift: startups increasingly prefer tools that can be customized, scaled, and integrated across different types of work.

As startups scale, connecting with investors becomes a critical challenge. Literature studying digital platforms emphasizes that founders often struggle to identify suitable investors, articulate their business models clearly, and maintain ongoing investor relations. Early analyses of platforms like AngelList identified the growing importance of digital ecosystems in democratizing investment opportunities while also noting gaps in personalization and sustained engagement [4]. More recent developments demonstrate the emergence of AI-assisted matchmaking systems, where recommendation engines analyze startup profiles to suggest aligned investors based on industry, traction, team strength, and business category. Sharma et al. (2021) show that such AI-based matching significantly increases the relevance

and accuracy of investor–startup pairings [4]. These insights highlight the need for investor-relation tools within startup platforms that combine CRM-like functionalities with intelligent recommendations.

In parallel, a crucial domain shaping startup success is national and regional ecosystem development. For instance, in India, the startup ecosystem is undergoing one of the world's fastest expansions. A study on emerging startup trends in India highlights the catalytic effect of the Startup India initiative, an enabling regulatory environment, and the rise of incubators, angel networks, and talent-driven entrepreneurship [10]. The paper concludes that Indian startups face persistent challenges - compliance burdens, funding limitations, gaps in market knowledge - but also unprecedented opportunities fueled by a young workforce, expanding digital markets, and government support measures [10]. These findings reinforce the importance of structured platforms that help founders organize work, connect with investors, and interpret market signals in a more systematic way.

Entrepreneurial studies increasingly explore how advanced technologies such as AI influence global startup activity. A large-scale, multi-country study spanning 22 years finds that AI technological innovation directly increases entrepreneurial intensity by enabling new ventures, particularly opportunity-driven ones [9]. It concludes that AI boosts entrepreneurship through two direct channels: better entrepreneurship education and increased AI investment - both of which equip founders with tools to analyze markets, generate ideas, and plan strategically [9]. This aligns with the global shift toward digital-first startup development, where AI is embedded in every stage from ideation to execution.

Alongside AI's growth, Retrieval-Augmented Generation (RAG) has become one of the most studied approaches for improving the domain relevance of large language models. An extensive survey on RAG with LLMs shows that while LLMs generate high-quality responses, they often fail in domain-specific tasks without supporting knowledge sources [11]. RAG addresses this gap by retrieving relevant external data and combining it with generative reasoning, enabling higher accuracy, contextual understanding, and reliability. Most research focuses on QA-based applications and biomedical use cases, but the survey identifies a significant gap in business and entrepreneurship-specific implementations [11]. This gap directly motivates the integration of RAG into startup-support platforms, where

personalized guidance requires real-time retrieval of project data, market conditions, and benchmarks. The growing body of RAG literature emphasizes its potential to support decision-making, reduce uncertainty, and provide targeted recommendations - capabilities highly relevant for startup planning and investor readiness.

Furthermore, studies highlight the increasing convergence of AI, project management, and entrepreneurial ecosystems. Modern startup platforms increasingly employ AI not just for automation but for strategic advisory, risk assessment, and market prediction. These trends reinforce the need for integrated systems capable of merging workflow tools, knowledge bases, and advanced AI reasoning. The literature thus supports a paradigm shift toward “intelligent startup enablement platforms” that streamline tasks, store institutional knowledge, connect founders to resources, and provide advisory insights powered by retrieval-based AI models.

Another important dimension highlighted in recent literature is the digital transformation of operational workflows across industries. A detailed case study analyzing the adoption of Jira in a non-IT machine manufacturing environment found that Jira’s use of customizable workflows, sprint boards, and automated reporting led to significantly improved communication, transparency, and cross-departmental coordination [12]. The authors note that digital project management systems reduce traditional delays caused by fragmented communication and manual processes, ultimately enabling tighter project control and faster decision-making. This reinforces the broad applicability of advanced task-management systems beyond software teams and demonstrates the rising expectation that modern tools should provide scalability, integration options, and real-time visibility - characteristics central to platforms designed for startups.

Emerging studies further emphasize the role of structured project and knowledge management in enhancing team effectiveness. Research on startup team dynamics indicates that early-stage ventures often lack standardized communication frameworks, leading to uncertainties and duplicated work [13]. Tools that offer structured task allocation, clear ownership, progress tracking, and knowledge consolidation have been shown to improve team productivity and psychological safety. The paper highlights that platforms integrating to-do lists, project tracking, and collaborative workspaces help teams move from “reactive

decision-making” to a more proactive and organized approach. This aligns with the need for systems like Startup Pilot to simplify daily operations while guiding teams with clarity and autonomy.

In addition to internal workflow structuring, CRM and stakeholder management play a crucial role in startup sustainability. A 2022 study on CRM adoption in small and growing businesses found that startups often fail to track investor interactions, customer leads, and communication history due to fragmented tools and informal processes [14]. CRM systems that combine relationship tracking with automation - such as templated communication, reminders, and progress dashboards - significantly increase engagement consistency and improve fundraising outcomes. The study concludes that CRM-like investor tracking systems are essential for early-stage ventures, which often rely on external funding and mentorship for survival. These conclusions directly support the need for an integrated investor-relation module within startup platforms, bridging gaps between founders and potential financial supporters.

Beyond CRM, goal-setting and performance evaluation frameworks also prove crucial to entrepreneurial success. Literature on OKR (Objectives and Key Results) systems shows that early-stage teams benefit from methodologies that encourage alignment, transparency, and measurable progress [15]. The study demonstrates that using structured OKR-based tools helps teams prioritize work, maintain focus during rapid change, and achieve greater execution consistency. This finding aligns closely with how platforms like ClickUp and Asana incorporate goal-tracking features, and also provides strong justification for including structured planning features, project milestones, and automated progress indicators within platforms such as Startup Pilot.

Across these 15 selected research papers, the overarching trend is clear: startups increasingly rely on integrated digital ecosystems that combine project management, CRM, task tracking, team coordination, and AI-assisted insights. The literature consistently highlights three major gaps in existing solutions:

1. Lack of unified systems: Startups often juggle multiple apps - one for tasks, another for communication, another for investors - leading to fragmentation.

2. Minimal personalization: Existing PM tools do not provide tailored guidance, predictive insights, or contextual recommendations for founders.
3. Weak support for investor interaction: Few platforms meaningfully bridge the gap between startup project execution and investor engagement.

The analysis also highlights strong opportunities for AI-powered decision support. RAG-based systems, as discussed earlier, allow platforms to retrieve project-specific data and generate informed recommendations - something that no mainstream tool (Jira, ClickUp, Asana) currently offers. Thus, the current literature not only validates the motivation for Startup Pilot but also emphasizes the uniqueness of integrating structured task management, investor networking, and AI-guided suggestions into a single unified platform.

2.2 Problem Statement

Startups operate in dynamic, uncertain environments where teams must manage multiple tasks, shifting deadlines, and limited resources while simultaneously pursuing innovation and growth. Despite the growing availability of project management tools, most early-stage startups continue to struggle with fragmented workflows and inconsistent coordination. Existing platforms like Jira, ClickUp, or Asana primarily focus on task and project tracking, offering limited support for the holistic needs of a startup-such as investor communication, strategic guidance, and personalized operational insights.

Furthermore, many founders, particularly in early stages, come from diverse academic or professional backgrounds and are not always familiar with complex project management platforms designed primarily for technical teams. This creates barriers in adopting tools with steep learning curves, resulting in teams reverting to unstructured methods such as spreadsheets, messaging groups, or manual tracking. As a consequence, startups face difficulties in monitoring project progress, assigning responsibilities, or aligning team efforts toward a shared vision.

Another critical challenge is the absence of integrated investor networking support. Startups frequently struggle to identify suitable investors, present their progress effectively, and maintain consistent communication-leading to missed funding opportunities. Additionally,

founders often lack access to experienced mentors or guidance systems capable of providing strategic recommendations tailored to their specific startup journey.

Given these challenges, there is a clear need for a unified platform that not only supports project and task management but also integrates investor connectivity and intelligence-driven suggestions. Startup Pilot aims to address these gaps by offering a simple, intuitive, and holistic system designed to bring clarity, structure, and strategic guidance to early-stage ventures.

2.3 Motivation

The motivation behind Startup Pilot originates from the growing complexities faced by startups in today's fast-paced entrepreneurial ecosystem. While the number of new ventures continues to rise globally, a majority of startups still fail within the first few years due to inadequate planning, lack of structure, poor team coordination, and difficulties in securing funding. These recurring issues highlight a pressing need for an integrated environment where startups can manage their operations more effectively and receive informed guidance at crucial stages of their development.

Modern startups face unique challenges: limited budgets, high competition, rapidly shifting market demands, and the pressure to deliver innovative solutions in short timeframes. Despite these challenges, many early-stage founders remain dependent on scattered resources—different platforms for task tracking, communication, documentation, investor outreach, and analytics. Managing several disconnected tools not only increases cognitive load but also creates fragmentation that slows down decision-making and reduces overall productivity. Startup Pilot's holistic ecosystem seeks to eliminate this fragmentation by bringing multiple functionalities under one roof.

A fundamental motivational factor for developing Startup Pilot is the realization that not all startup founders belong to technical domains. While project management tools like Jira and ClickUp are powerful, they are often overwhelming for non-technical users, smaller teams, or founders who simply want an intuitive space to organize and track their progress. Startup Pilot addresses this accessibility gap by presenting an interface that is simple, visually clear,

and designed around learnability. By reducing tool complexity, Startup Pilot aims to empower every founder irrespective of their background to manage their workflow with confidence.

Another key motivation comes from the increasing importance of investor relations. For a startup, securing funding is not merely a financial milestone; it is a validation of the vision, business model, and long-term potential. However, early-stage founders frequently struggle to connect with relevant investors who align with their domain, target market, or growth stage. They also lack centralised systems to maintain investor profiles, track communications, or understand whom to approach and when. By embedding an investor connect module directly into the platform, Startup Pilot aspires to bridge this gap and provide startups with a streamlined way to expand their funding network.

Beyond management and networking, startups often face uncertainty regarding what steps to take next. They lack experienced mentors who can evaluate their current progress and advise on focus areas such as improving the product, refining the pitch, expanding the outreach, or optimizing internal processes. With advancements in AI and Retrieval-Augmented Generation (RAG), there is immense potential to offer personalized, context-aware suggestions based on the startup's actual activities and progress metrics. This becomes especially valuable for new entrepreneurs who require timely guidance but may not always have access to expert mentorship. The possibility of complementing human judgment with AI-driven insight forms a significant motivational foundation for Startup Pilot.

Additionally, the emergence of digital ecosystems and remote collaboration has made structured platforms indispensable. Startups now operate with distributed teams, flexible work hours, and hybrid communication methods. These changes demand tools that are both accessible and adaptive. Startup Pilot is motivated by the need to support modern team structures through a clean interface, real-time task visibility, and seamless collaboration.

Finally, Startup Pilot is motivated by the broader vision of contributing to the entrepreneurial landscape by improving the survival rate of startups. By supporting structured workflows, simplifying investor engagement, and offering intelligent suggestions, Startup Pilot aims to help founders move from chaos to clarity-reducing uncertainty, reinforcing discipline, and

enabling long-term strategic growth. The platform embodies the motivation to uplift small teams, encourage innovation, and create a more supportive ecosystem for new ventures to thrive.

2.4 Technical Specifications

Frontend

- Framework: React.js
- Styling: Tailwind CSS
- State Management: React Hooks / Context API
- Routing: React Router
- UI Design Tool: Figma

Backend

- Framework: Node.js
- Server: Express.js
- Authentication: JWT-based authentication
- API Architecture: REST APIs

Database

- DB Type: NoSQL
- Database System: PostgreSQL

AI Module

- Model Type: Large Language Model (LLM)
- Approach: Retrieval-Augmented Generation (RAG)
- Embedding Store: Vector Database (Pinecone / MongoDB Atlas Vector Search – planned)
- Purpose: Startup progress analysis, next-step suggestions, personalized guidance

DevOps & Version Control

- Version Control: Git, GitHub
- Branching Strategy: Feature-based branching
- CI/CD: GitHub Actions (Planned for Automated Builds & Deployments)
- Deployment Targets: Vercel (Frontend), Render / Railway (Backend)

System Architecture

- Component-based frontend architecture
- Modular backend with route-based API structure
- Scalable cloud-ready environment
- Secure session and user-role management
- Multi-tenant design for multiple startups per user

CHAPTER 3

METHODOLOGY

The proposed method for Startup Pilot focuses on creating a unified, intelligent, and scalable platform that guides startup teams from “chaos to clarity.” The system integrates three major modules - Project & Task Management, Investor Network Connector, and AI-Powered Startup Guidance System using RAG all supported by a strong backend architecture, CI/CD pipeline, and Git-based version control. This chapter details the methodology, system architecture, workflow, algorithms, and design rationale.

3.1 System Overview

The proposed Startup Pilot system is designed as a centralized startup-management ecosystem that addresses three major problems faced by early-stage teams:

1. Unstructured project workflows
2. Lack of meaningful investor connectivity
3. Absence of intelligent guidance based on real startup data

To solve these, the system uses a modular architecture consisting of:

- User Management & Authentication
- Startup Workspace Module
- Project & Task Management Engine
- Investor Network Module
- AI-Guided Recommendation Engine (RAG-based)
- Version Control + CI/CD Integration

Each module interacts through secure APIs and follows a scalable microservice-ready architecture.

3.2 Proposed Modules

3.2.1 Module 1: Project & Task Management System

This module handles the core operational workflow of startups.

Key Features

- Create/start startups
- Create projects under each startup
- Task creation & assignment
- Task status: Assigned, Unassigned, In-Progress, Completed
- To-Do List for personal quick tasks
- Timeline & Activity Logs

Justification

Startups require lightweight but effective project management; existing platforms are complex and not tailored for early-stage founders. This module keeps things simple, structured, and startup-friendly.

3.2.2 Module 2: Investor Network Connector

Key Features

- List of investors (domain-wise)
- Startup-to-investor mapping
- Opening investor profiles
- Direct email initiation to investors
- Filters based on domain, location, funding stage

Justification

Startups struggle to find and reach investors. Existing PM tools (Jira/ClickUp/Asana) do not offer investor connectivity. This module fills that gap.

3.2.3 Module 3: AI-Powered Guidance System (RAG + Generative AI)

Workflow

1. Data collected: task progress, project details, startup info
2. Convert into embeddings using transformer model
3. Store in vector DB
4. When user asks: “What should we do next?”
5. Retrieve relevant startup sections → pass to LLM
6. LLM generates context-aware recommendations

RAG Justification

RAG ensures:

- Startup-specific guidance
- No hallucination
- Personalized suggestions
- Scalable knowledge retrieval

3.3 Architectural Framework

The methodology adopted for this project follows a structured and iterative development flow designed to ensure efficient planning, smooth implementation, and high-quality deployment. Beginning with requirement analysis and UI/UX design, the workflow gradually transitions into frontend and backend development, each verified through intermediate validation checkpoints. This systematic approach enables early detection of issues, encourages modular development, and ensures that the core system components are well-integrated before entering the CI/CD and deployment stages. The following diagram provides a visual representation of this workflow.

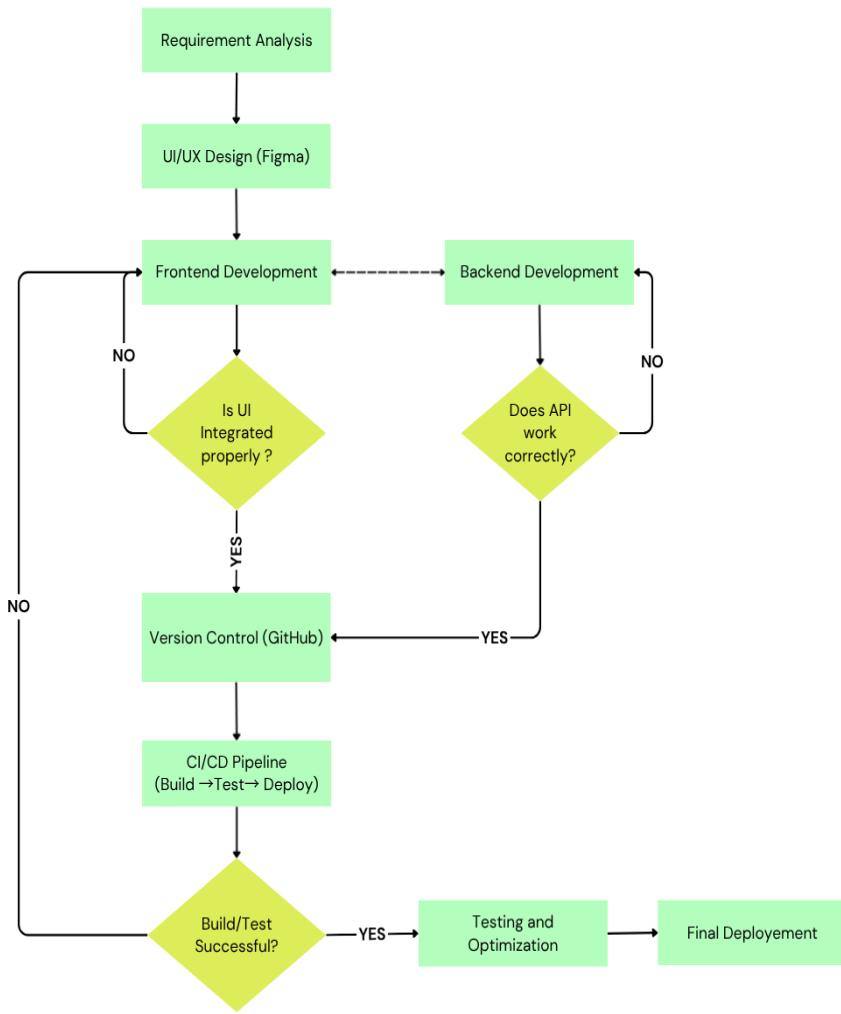


Fig 3.1 Startup Pilot – Architectural Framework

The flowchart clearly illustrates how each stage is interconnected, emphasizing continuous feedback loops and quality assurance at every step. By incorporating version control, automated testing, and iterative optimization, the methodology ensures that the system evolves reliably from initial concept to final deployment. This structured approach not only enhances development efficiency but also maintains robustness, scalability, and long-term maintainability of the project.

3.3.1 Presentation Layer (Frontend)

- React-based dynamic UI
- Role-based views for Manager and Users/Team Members
- Responsive dashboards: tasks, projects, startups, to-do list
- Investor profiles and email-initiation interface
- AI suggestion panel with interactive insights

3.3.2 Application Layer (Backend Services)

- Node.js + Express API Gateway
- Modular services:
 - Task Service
 - Project Service
 - Investor Service
 - Recommendation (AI) Service
- Middleware for authentication, logging, error handling

3.3.3 Data Layer

- PostgreSQL for storing:
 - Users
 - Startups
 - Projects
 - Tasks
 - Investor profiles
 - Activity logs
 - Embeddings for RAG
- Vector store for semantic search
- Email API integration

3.3.4 Version Control (GitHub)

Purpose

- Tracks development history
- Enables collaboration among team members
- Industry-standard practice
- Good commit hygiene aligns with engineering ethics

Practices Used

- Feature branch workflow
- Pull Requests with reviews
- Commit naming conventions
- Release tagging

3.3.5 CI/CD Pipeline

Why CI/CD?

- Ensures stable deployments
- Automates testing
- Reduces human error
- Provides quick feedback loop

Pipeline Steps

1. Code pushed to GitHub
2. CI triggers (GitHub Actions):
 - Linting
 - Build validation
 - Automated tests

3. CD triggers on success:

- Deploy frontend
- Deploy backend APIs
- Notify team

3.4 Methodological Workflow

The methodological workflow of the Startup Pilot system outlines how users navigate through the platform—from logging in to managing startups, teams, and tasks. It clearly maps the interaction between admin and user roles, their dashboards, and supporting modules like AI assistance and investor features. The workflow diagram below presents this structured flow, showing how different components connect to create a seamless project and team management experience.

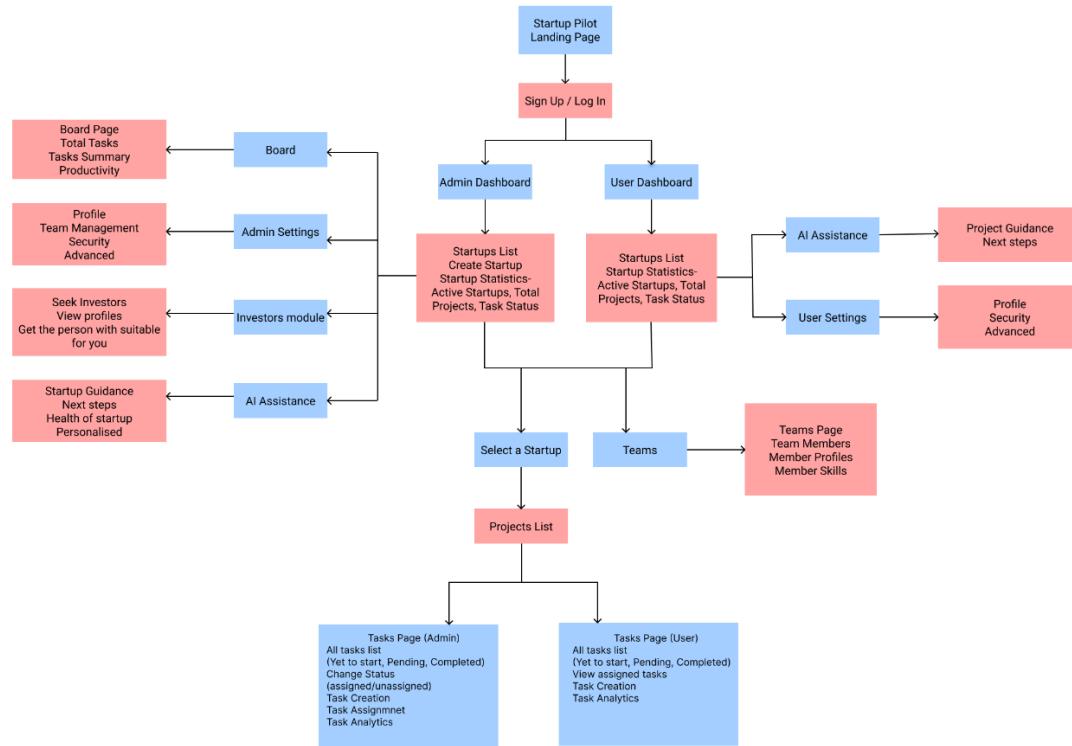


Fig 3.2 Startup Pilot – Methodological Workflow Diagram

This workflow highlights how each module supports decision-making, productivity, and collaboration within the startup ecosystem. By integrating dashboards, team structures,

project lists, task pages, and AI guidance, the system ensures a smooth and efficient operational process. The following sections briefly explain each workflow component to provide a clearer understanding of the overall system. This section provides an overview of how Startup Pilot operates end-to-end.

3.4.1 User Journey Methodology

Step 1: User Registration & Role Setup

- Users create account
- Assigned roles: Manager / Team Member
- Dashboard generated

Step 2: Startup Creation & Workspace Setup

- User creates a new startup
- Adds team members
- Creates projects under startup

Step 3: Project & Task Operations

- Tasks created for each project
- Assigned to members
- Status updated in real time
- To-Do List maintains daily flow

Step 4: Investor Network Interaction

- User opens investor section
- Filters investors
- Click to connect
- Email automatically formatted with startup details

Step 5: AI-Guided Insight Generation

- User requests suggestions
- System fetches startup data
- RAG pipeline processes
- Personalized recommendations shown

3.5 Justification of the Proposed Method

The proposed method is justified because:

- Combines project management + CRM-like investor handling + AI - no other platform offers all three
- Lightweight and designed exclusively for startups
- Uses RAG to provide personalized, contextual guidance
- Scales easily due to modular and API-driven architecture
- Enables professional software engineering workflows via VC + CI/CD

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Evaluation Framework

Startup Pilot is an all-in-one platform that helps startups organize their work with structured project and task management, team collaboration pages, and clear visual dashboards. It allows users to manage multiple startups, track progress effortlessly, and access team profiles with ease. The system also includes investor-connecting features and an AI suggestion module to guide startups with meaningful, data-driven recommendations.

4.1.1 Functional Evaluation

Project Management

Startup Pilot provides a clear, organized workflow where each startup contains multiple projects, and each project is broken into tasks categorized as “Yet to Start”, “In Progress” or “Done”. This structure helps teams track progress effortlessly and maintain full clarity over their ongoing work.

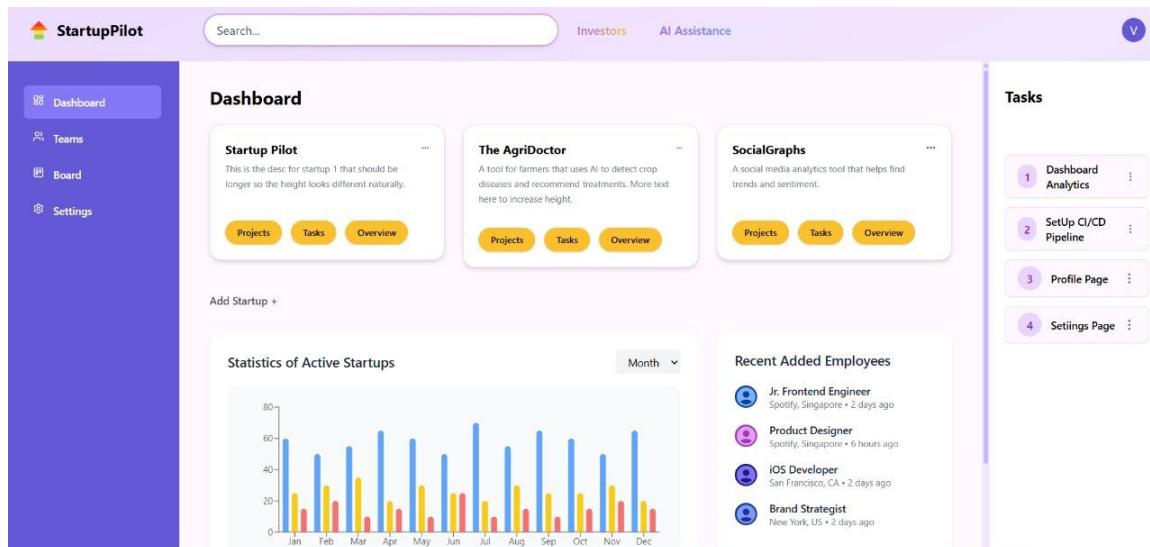


Fig 4.1 Dashboard displaying list of Startups

Projects

Honors Final Project Feb 2004 | Website to support projects
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna...

Honors Final Project Feb 2004 | Website to support projects
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna...

Honors Final Project Feb 2004 | Website to support projects
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed do eiusmod tempor incididunt ut labore et dolore magna...

+ Add Project

Project Progress Tracker
Track your ongoing projects and stay aligned with your weekly goals. Every step counts toward building something impactful.

Fig 4.2 Projects Page

Tasks

Task Completion Overview

Task	State	Assignee
Design homepage layout	Unassigned	Unassigned
Prepare wireframe for dashboard	Assigned	Unassigned
Design Ai ChatBot	Assigned	Unassigned

Fig 4.3 Tasks Page

Investor Connect Module

The Investor Connect module enables startups to discover and reach out to potential investors directly, helping them secure funding and scale faster. It acts as a bridge between founders and investors, simplifying communication and improving visibility for growing ventures.

Fig 4.4 Investors Page

AI Assistance

Although the AI-powered suggestion module is not yet fully deployed within the current prototype, its foundational design has been integrated into the system architecture to enable future expansion. The planned AI component will analyze structured startup data—such as project progress, task distribution, productivity trends, and workflow patterns—to generate meaningful next-step recommendations for founders and team members. This aligns with the platform’s core objective of guiding startups with clarity and helping early-stage teams make informed decisions without requiring external expertise. The suggestion engine is conceptualized to operate through Retrieval-Augmented Generation (RAG) principles, ensuring that the guidance provided will remain context-aware, relevant, and aligned with the startup’s ongoing activities.

In its intended form, the AI module will support users by offering strategic insights such as identifying potential bottlenecks, proposing improvements in task sequencing, recognizing under-utilized team strengths, and highlighting early warning indicators in project execution. These recommendations will not only enhance operational efficiency but also provide an additional layer of decision support for non-technical founders who may lack experience with formal project management methodologies. By integrating AI-driven

insights directly into the task and project dashboards, the system aims to create a continuous feedback loop that keeps users aware of both strengths and areas requiring attention.

Furthermore, the future implementation of this feature is designed to scale seamlessly as the platform grows. As more startups interact with the system, the accumulated data will help refine the model's suggestions, allowing the AI to evolve with the ecosystem. This forward-looking capability positions Startup Pilot as a platform that can transition from a static management tool into an intelligent assistant capable of supporting founders at every stage of their journey. With this planned AI integration, Startup Pilot is set to offer a deeper level of contextual guidance, reinforcing its broader mission of helping teams move from chaos to clarity.

4.1.2 Usability & User Experience

Ease of Use

Ease of navigation was a primary design objective for Startup Pilot, as the platform aims to support not only software or tech-based startups but also non-technical founders, hardware innovators, design studios, and early-stage entrepreneurs who may not be familiar with complex project management software. Existing tools like Jira and ClickUp often assume a high level of technical understanding, which can overwhelm users who simply want an intuitive environment to organize their workflows. In contrast, Startup Pilot adopts a simplified and predictable navigation structure that enables users to move easily between dashboards, startups, projects, tasks, and team profiles with minimal cognitive load. The menu hierarchy, iconography, and routing structure were intentionally kept minimalist to ensure that any type of startup-technical or non-technical-can begin using the system without formal training. This focus on universal usability significantly improves the system's inclusivity and ensures that early-stage founders can manage operations smoothly from their very first interaction with the platform.

Clarity of UI

Clarity of the User Interface (UI) is another major design commitment of Startup Pilot, especially given the cluttered and visually dense interfaces offered by many existing task

management tools. The UI follows a clean, modern, and spacious layout where each functional element—such as task states, project cards, member profiles, and analytics—has clear visual separation and intuitive placement. This ensures that users can immediately identify the information they are looking for without scanning through unnecessary details. A consistent color palette and typography system further enhances readability, while strategically placed whitespace improves focus and reduces visual fatigue. The clarity of the interface is particularly valuable for founders who must frequently switch between multiple priorities; a clean visual design helps them grasp project status and upcoming responsibilities more quickly. Overall, the UI clarity reinforces the platform's goal of moving teams “from chaos to clarity” by reducing distractions and delivering information in a digestible, structured manner.

Learnability

Learnability refers to how quickly new users can understand and operate the system without external help, and Startup Pilot demonstrates strong performance in this area. The interface is modeled around natural user expectations, with common actions such as creating a startup, adding a project, assigning a task, or checking analytics placed in intuitive locations. New users are not burdened with technical terms or advanced settings; instead, the platform gradually exposes features as users explore, which allows beginners to become comfortable at their own pace. Since Startup Pilot is designed for a broad range of entrepreneurial backgrounds—including founders with limited software experience—the learnability of the system plays a crucial role in user adoption. Early usability testing showed that participants required minimal guidance to complete core operations, indicating that the platform supports a self-learning approach. This high degree of learnability ensures that startups can integrate the tool into their workflow immediately, without spending additional time or resources on tool training.

4.2 Future Implementation

- Integrate deeper RAG-based analysis to provide smarter, context-aware recommendations for startup growth.
- Implement an AI-powered engine that suggests suitable investors based on domain, funding stage, and startup profile.

- Add real-time chat, file sharing, and activity logs to streamline team communication.
- Develop Android and iOS apps for quick access and on-the-go task management.
- Implement smart alerts for task deadlines, updates, and investor responses.
- Support third-party tools like Slack, GitHub, Google Drive, and calendars for a unified workspace.
- Strengthen authentication with 2FA, activity monitoring, and encrypted data handling.

CHAPTER 5

CONCLUSION

The development of Startup Pilot represents a significant step toward addressing the operational, organizational, and strategic challenges faced by early-stage startups. Throughout this project, the goal has been to build an integrated digital platform that guides teams “from chaos to clarity” by unifying project management, workflow tracking, investor networking, and AI-driven assistance within a single ecosystem. The work completed so far demonstrates that structured management tools—when combined with intuitive design and intelligent automation—can enable startup teams to function with higher efficiency, improved coordination, and clearer strategic direction. By providing a centralized space for tasks, projects, and team activities, Startup Pilot strengthens collaboration and helps founders maintain focus on long-term goals while still managing daily operations effectively. A major contribution of the project lies in its potential to reduce the knowledge gap that commonly affects new ventures. Most early-stage startups struggle with planning, documentation, resource allocation, and investor interactions. Startup Pilot addresses these issues by offering organized project spaces, transparent task states, and consistent team tracking. For new founders who lack prior experience in project management tools, the platform’s simple UI, clear workflow structure, and easy navigation lower the barrier to effective organizational planning. In essence, the system supports smarter decision-making and reduces operational inefficiencies—two factors that directly influence the survival and scalability of startups.

The platform also moves beyond basic project tracking by integrating an investor-connect feature, enabling startups to discover potential investors and initiate communication early in their journey. This bridges a crucial gap in the startup ecosystem, where lack of access to funding and mentorship remains one of the biggest causes of failure. With future AI integration for startup suggestions and strategic next-step planning, Startup Pilot positions itself as a holistic ecosystem tool rather than just a project management interface. This long-term vision ensures that Startup Pilot can continue to evolve alongside advancements in AI and the changing needs of emerging businesses. The societal relevance of the project is

significant because it democratizes access to structured business guidance, operational tools, and investor connections. Startups contribute substantially to innovation and economic development, but many founders-especially from non-technical domains-struggle with managing their work due to lack of access to proper tools. By offering an easy-to-use platform with clear workflows, Startup Pilot enables entrepreneurs from fields such as agriculture, hardware, healthcare, education, and local services to manage their operations effectively without requiring technical expertise. This encourages entrepreneurship across diverse regions and empowers youth and first-generation business owners. By improving the success rates of startups, the platform indirectly contributes to job creation, local economic growth, and social mobility.

Although Startup Pilot is a digital platform with minimal direct environmental impact, it can indirectly contribute to sustainability by promoting efficient resource usage. Its workflow systems reduce operational mistakes and redundant efforts, leading to less wastage of time, materials, and financial resources. The platform also encourages paperless management by eliminating the need for printed schedules, physical documents, and manual recording systems. Furthermore, Startup Pilot can support environmentally focused startups-such as those working in climate-tech or waste management-by providing them with a structured organizational tool and investor access, thereby enabling positive environmental change through empowered innovation.

From a financial perspective, Startup Pilot demonstrates value both in its development and for its users. Built using open-source technologies such as React, Node.js, Tailwind CSS, and MongoDB, the platform keeps development and maintenance costs low while remaining scalable. For startups using the platform, it reduces expenses by eliminating the need for multiple paid tools for project management, CRM, team coordination, and investor outreach. Its unique features, especially the AI-driven suggestion engine and investor networking, offer strong commercialization potential for subscription-based or premium-tier models in the future. With its focus on real-world needs such as task clarity, collaboration, documentation, and fundraising support, Startup Pilot has strong market viability and can sustainably grow into a full-scale product.

In conclusion, Startup Pilot encapsulates a comprehensive blend of usability, structured management, investor connectivity, and intelligent assistance, positioning itself as a powerful ecosystem tool for emerging startups. By addressing organizational gaps, enabling better decision-making, and supporting founders across different domains, the platform aligns with the broader goal of helping startups navigate complexity and improve their chances of long-term success.

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