

GreenLink: Bridging the Gap Between Agricultural Expertise and Household Needs

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Abstract

This is an innovative application that applies advanced machine learning techniques to come up with a dynamic platform bringing together farmers and local service providers with households in need of their services. In the process of offering tailored freelance opportunities, GreenLink improves efficiency not only in the agricultural sector but also in outdoor cleaning and maintenance services. This is an inclusive marketplace where there will be collaboration across diverse sectors, ensuring that farming and local service needs are effectively met. In its intelligent matchmaking and real-time updates, GreenLink revolutionizes the way communities' access and manage freelance work.

1. Problem Statement

As the world gets faster, so does the demand for effective, convenient freelance services. It is no exception for the agricultural sector and the local service industry, who are continually in need of reaching out to potential clients. The struggle to get continuous opportunities that fit the skills and availability of one is similarly experienced by the farmers and local workers. Farmers and small-scale agricultural workers experience a problem in accessing markets and getting jobs that give them a fair wage. Similarly, local workers engaged in various jobs such as cleaning and maintenance do not have many platforms through which they could offer their services to more people.

GreenLink targets bringing together the agricultural professionals, local service providers, and the households that need these services. This work is important in addressing inefficiencies in connecting skilled individuals to potential clients, improving livelihoods, and fostering economic growth. GreenLink is working toward a smooth, efficient platform that serves farmers and local workers in ensuring their skills are effectively and equitably applied by the use of state-of-the-art machine learning techniques.

2. Market, Customer and Business Need Assessments

2.1 Market Need

The global agriculture market is expanding rapidly, driven by increasing demand for crops and livestock products due to population growth, changing diets, and urbanization. This sector encompasses a wide range of activities, including horticulture, floriculture, vegetable farming, mushroom cultivation, budding and crafting, organic farming, agroforestry, permaculture, greenhouse management, and livestock product management. The diversity within agriculture highlights the broad spectrum of services and products needed to meet varying consumer demands.

In India, agriculture remains a critical component of the economy, with about 50% of the population engaged in farming. This sector contributes significantly to exports, yet Indian farmers face substantial challenges such as market access issues, financial instability, poor crop yields, and limited awareness of available subsidies.

Additionally, there is a growing need for stable employment and full-time job opportunities for farmers and agricultural workers, many of whom face irregular incomes and job insecurity. Urban areas also require on-demand agricultural services to meet the increasing health consciousness of consumers who are seeking fresh, locally-sourced produce and sustainable practices. Addressing these needs presents a key opportunity for innovative solutions that support both agricultural workers and households in need.

2.2 Customer Needs

The customer base for this app can be categorized into two primary segments, each with distinct needs and requirements:

- 1) **Farmers and Workers:** Farmers and agricultural workers constitute a significant segment of our app's customer base. These individuals seek a platform that provides access to freelance or full-time job opportunities tailored to their skills and preferences. They require a reliable means of securing regular income and fair pay for their services. Many in this group face challenges such as unstable earnings and limited access to job opportunities, highlighting the need for a dedicated platform that connects them with consistent work and ensures equitable compensation.
- 2) **Householders:** The second segment includes householders who need assistance with various house farming and outdoor tasks. These customers are looking for freelancers or full-time workers to help with gardening, maintenance, and other agricultural activities. They require a convenient and efficient way to find reliable help for their specific needs, aiming for high-quality service and the ability to hire based on their immediate requirements.

Both farmers/workers and householders share several common needs. They require a user-friendly platform that is accessible and easy to use for everyone that simplifies the process of finding job opportunities or hiring services. This includes convenient access to relevant listings and reliable services. Region-wise access to job opportunities or workers to ensure relevant matches based on location. The platform must offer efficient management and support to address any issues or queries that arise. Additionally, secure payment methods are essential for safe and straightforward transactions. Effective communication tools for notifications and updates are also crucial for keeping users informed.

| Farmers/Workers Needs | Householders Needs |
|--|--|
| Job Matching: Accurate matching with relevant job opportunities based on skills and location. | Ease of Finding Help: A straightforward platform to find and hire freelancers or full-time workers for various tasks. |
| Stable Employment: Access to a steady flow of job opportunities to ensure regular income. | Convenient Hiring: Simplified hiring process for gardening, maintenance, and other household tasks. |
| Fair Compensation: Assurance of equitable pay for services provided. | Quality Assurance: Access to reliable and skilled workers based on ratings and reviews provided by other users. |
| Visibility and Access: Increased access to job opportunities that might otherwise be difficult to find. | Flexibility: Options to hire workers on a freelance or full-time basis according to immediate needs. |

2.3 Business Needs

To keep our app thriving and evolving, we need to think about how it can generate revenue while still providing value to our users:

1. **Service Fees:** We plan to charge a small service fee for each transaction between farmers/workers and householders. This could be a percentage of the total or a flat fee per job. It's a simple way to keep the platform running smoothly.
2. **Marketplace Commissions:** Our app features a marketplace where users can buy seeds, tools, and other farming supplies. By taking a small commission on each sale, we not only help users access what they need but also support the app financially.
3. **Advertising:** We offer advertising opportunities to local businesses and agricultural suppliers. This allows them to reach a focused audience while giving us a chance to earn some revenue.
4. **Paid Promotions:** Users can boost their visibility by opting for paid promotions. Whether it's a farmer wanting more job offers or a business looking to sell more products, these promotions can help increase their reach within the app.
5. **Paid Version for Advanced Filtering:** For users who need more detailed search options, we'll offer a premium version of the app. This could be available as a subscription or a one-time purchase, giving users more control and personalization.

3. Target Specification and Characterization

The success of our app depends on clearly defining the specifications and characteristics that cater to our target audience. Here's what we're focusing on:

1. User-Friendly Platform

- **Accessible to All:** We've designed the app to be intuitive and easy to use for everyone, no matter their level of tech savvy.
- **Language Preferences:** Choose from a variety of languages to make navigation smooth and enjoyable.
- **Regional Filtering:** Find exactly what you need with region-specific listings tailored to your location.

2. Secure Payment System

- **Safe Transactions:** Our payment system is designed to keep your financial details safe and secure, making sure that all transactions are protected and reliable.

3. Scalability

- **Growing with You:** The app is made to scale seamlessly as we gain more users and expand our offerings, ensuring top performance as our community grows.
- **Efficient Resource Management:** We optimize resources to keep everything running smoothly and quickly, no matter how many people are using the app.

4. Profile Creation and Customization

- **Personal Touch:** Create and personalize your profile to match your unique needs and preferences.
- **Tailored Experience:** Set your preferences to get the most relevant job opportunities and services that align with what you're looking for.

5. Communication and Planning Tools

- **Streamlined Interaction:** Enjoy features that make communication and planning straightforward, helping you stay organized and on top of your tasks.

6. Performance Requirements

- **Fast and Reliable:** We focus on delivering quick response times and reliable performance, ensuring a smooth experience under all conditions.
- **Consistent Quality:** We're committed to maintaining high standards of usability and speed, even as your needs evolve.

4. Benchmarking

1) GreenPal

Features: **GreenPal** excels in lawn care and landscaping, offering an intuitive platform that simplifies the booking process and includes a robust review system to ensure service quality. This approach can guide our app in developing specialized agricultural features and creating a seamless booking experience.

2) TaskRabbit

Features: **TaskRabbit** covers a wide range of tasks, including gardening, with flexible scheduling options to meet users' varying needs. It features a strong reputation management system through user reviews, which enhances trust and reliability. Our app can incorporate a broad spectrum of agricultural services, flexible scheduling, and a comprehensive review system to provide reliable and versatile options.

3) Thumbtack

Features: **Thumbtack** offers detailed profiles for service providers, a quote comparison system, and extensive user ratings. These elements help users make informed decisions and ensure high-quality service. Our app can benefit from adopting similar features, including detailed profiles for providers, a system for comparing quotes, and an in-depth ratings system to promote transparency and service excellence.

5. Applicable Regulations

1) Personal Data Protection Bill (PDPB):

- **Scope:** This bill governs data protection in India, including user consent, data localization, and the establishment of a Data Protection Authority (DPA).
- **Implications:** Obtain explicit user consent for collecting data used in recommendations and marketplace transactions. Ensure compliance with data localization requirements and user rights for data access and rectification.

2) **Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011:**

- **Scope:** These rules provide guidelines for handling sensitive personal data, including data protection and breach notification.
- **Implications:** Implement robust security practices for user data, especially for payment transactions and personal recommendations. Notify users in case of data breaches.

3) **Consumer Protection Act, 2019:**

- **Scope:** Regulates marketplace operations and protects consumers from unfair trade practices.
- **Implications:** Ensure that the marketplace for seeds and other goods complies with fair trading practices and provides accurate information about product quality and availability.

4) **National Environmental Policy, 2006:**

- **Scope:** Focuses on sustainable development and environmental protection in India.
- **Implications:** If the app involves any environmental impact (e.g., promoting organic farming or green practices), ensure that operations align with sustainability principles and encourage eco-friendly practices.

5) **Green Rating Systems:**

- **Scope:** Various regional and national systems provide ratings for environmental performance and sustainability.

- **Implications:** Consider incorporating eco-friendly options in the marketplace and promoting sustainable products to align with green rating standards.

6. Business Model

1) Service Fees:

Charge a fee for connecting farmers and workers with householders, either as a percentage of each transaction or a fixed amount per job.

2) Marketplace Commissions:

Earn from sales of agricultural supplies through the app's marketplace by taking a commission or fixed fee per transaction.

3) Advertising:

Generate revenue from in-app advertising for related businesses and services, such as banners and sponsored content.

4) Paid Promotions and Premium Features:

Offer users the option to pay for premium features, like advanced filtering and priority listings, through tiered subscriptions or one-time payments.

5) Subscription Model:

Provide monthly or annual subscription plans with extra benefits, such as unlimited job applications or advanced analytics.

7. Concept Generation

The inspiration for this app came from observing the everyday struggles of my community, where agriculture is a central part of life. Many local residents, both men and women, prefer working close to home. I noticed that while farmers and agricultural workers are dedicated to their work, they often struggle with inconsistent income and difficulty finding stable, fairly paid

jobs. They face downtime after their main work and lack a steady source of income, which compounds their challenges.

Additionally, I saw a growing trend among younger generations who are moving away from agriculture due to limited opportunities in the sector. They need a platform that provides nearby job opportunities, allowing them to work freelance while remaining connected to agriculture.

On the other hand, many householders are increasingly interested in starting house farming or gardening to produce nutritious and healthy food for their families, especially given the rising concerns about the use of chemicals in agriculture. However, they often lack the time or expertise to engage in these activities due to their busy schedules. They need a reliable way to find skilled farmers and workers who can assist with these tasks. Our app addresses this need by offering a platform that connects householders with agricultural workers and outdoor helpers, enabling them to undertake house farming, gardening, and other tasks with ease.

By bridging these gaps, the app supports both agricultural workers and householders, creating a mutually beneficial platform that enhances job opportunities and promotes healthier living through home-based farming.

8. Concept Development

First-time users are prompted to register or create an account when they launch the app. After registration, they are greeted with a user-friendly home tab interface, designed to resemble popular service apps. Users can browse profiles of farmers/workers and householders based on their location. A search feature allows users to find specific services or needs, with suggestions based on popular searches.

Once users select a profile, they can view details about available services, such as gardening, farming, or related tasks, sorted by category and user preferences. Users can directly message the chosen profile to discuss job details, availability, and payment through a customized in-app messaging system. Upon agreement, users confirm the job and accept the app's policies.

Payment is processed through a secure in-app system upon work completion, ensuring both parties confirm the service's satisfactory completion. Users can access a history of transactions and manage their payments within the app.

Premium users enjoy advanced features, including personalized recommendations based on usage patterns, advanced search filters, and detailed profile access. They also receive benefits such as payment assistance, marketplace discounts, and an ad-free experience.

The app includes a help desk for assistance with any issues or disputes, ensuring reliable support. After completing a job, users are encouraged to provide feedback and rate their experience, helping maintain high standards and trust within the platform.

9. Final Product Prototype

This app aims to support local farmers and householders by creating a platform that connects them for freelance and full-time agricultural work. The app promotes sustainable practices and provides a marketplace for buying high-quality agricultural supplies. It ensures financial profitability by facilitating seamless transactions and collaborations. The app utilizes various data sources, including:

1. User Data:

- Includes profiles, preferences, interactions, and feedback.
- Personalizes user experiences and improves matchmaking between farmers/workers and householders.

2. Service Providers and Service Seekers:

- **Service Providers:** Information includes availability, expertise, and reviews of farmers and workers.
- **Service Seekers:** Details on profiles, needs, and past interactions of householders.
- This data ensures effective collaborations by matching suitable service providers with householders.

3. Smart Filtering Engine and Recommendation System:

- Utilizes the collected data to process and filter relevant information through advanced algorithms, ensuring accurate and personalized recommendations.

4. Localized Suggestions and Marketplace:

- **Localized Suggestions:** Provides personalized recommendations for users based on geographic and preference data.

- **Marketplace Data:** Covers product listings, pricing, and transaction history for seeds, tools, and fertilizers. This data helps in tracking sales and commissions.

5. Network & Collaborate:

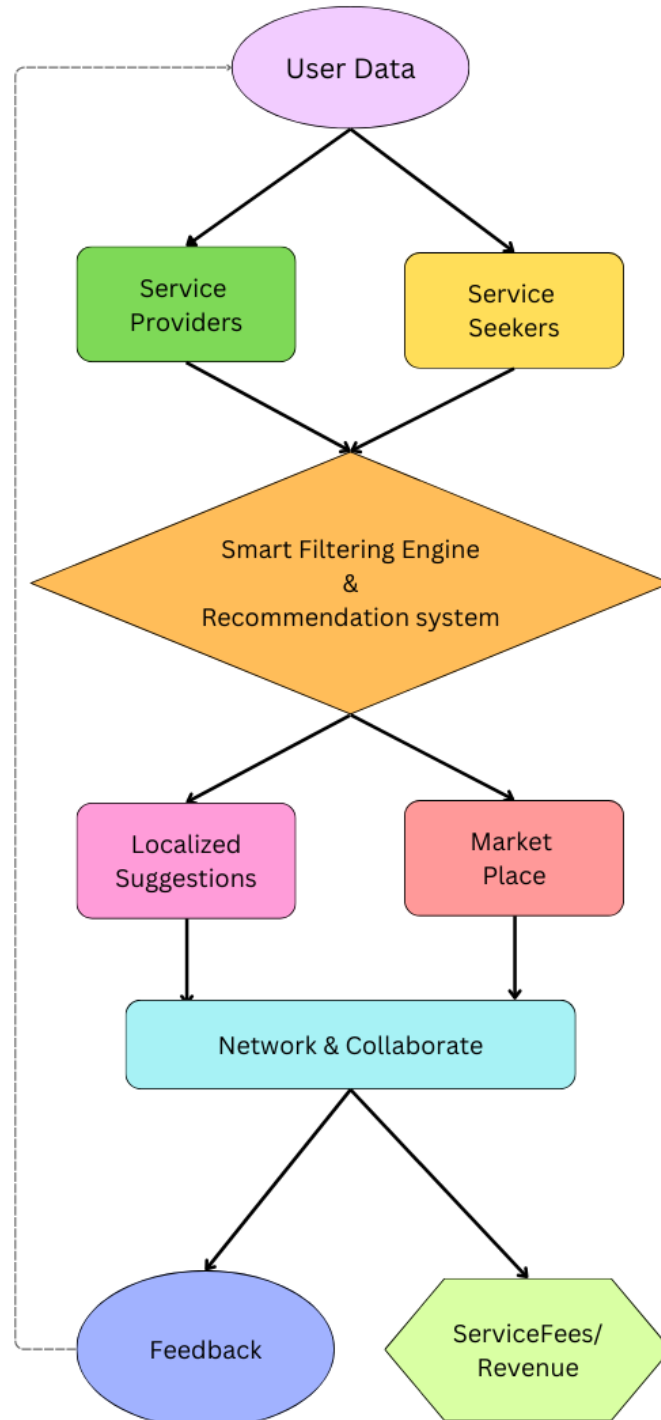
- Facilitates collaboration between users and enhances networking opportunities within the platform.

6. Feedback and Service Fees/Revenue:

- Collects user feedback to continuously improve the app experience.
- Manages service fees and revenue generation through transactions facilitated by the platform.

All the obtained data is processed using machine learning models, such as recommendation systems and predictive analytics, to enhance the user experience by providing personalized recommendations and efficient search results. This comprehensive approach not only improves service delivery but also boosts user engagement and app revenue.

Schematic Diagram



10. Product Details

10.1 How Does It Work

- 1) **Sign Up/Login:** Users start by creating an account or logging in with their details to access the app.
- 2) **Browse:** Depending on their needs—whether they’re looking for farmers/workers or householders—the app provides tailored recommendations. Users can also search directly for specific needs.
- 3) **Connect:** Users can connect with individuals they are interested in, whether for freelance work or other services.
- 4) **Send Requests/Direct Messages:** Through the in-app messaging system, users can inquire about availability and details.
- 5) **Confirm and Pay:** Once a match is found, users proceed to confirm the service details and make payment arrangements.
- 6) **Service Completion:** After the service is completed and confirmed by both parties, the payment is processed. Service providers receive payment within a specified time frame.
- 7) **Provide Feedback:** Users can leave feedback and reviews on the service provided, helping others make informed choices.
- 8) **Repeat:** Users can continue to browse for new services or needs, enjoying a seamless experience.
- 9) **Marketplace Access:** Users can explore and purchase agricultural supplies from the marketplace.

Paid Version Benefits

- **Advanced Search:** Access to enhanced search features for more precise results.
- **Marketplace Discounts:** Special discounts on marketplace items.
- **Ad-Free Experience:** Enjoy an uninterrupted, ad-free app experience.

10.2 Data Sources

- **User Data:** Includes profiles, preferences, interactions, and feedback to personalize the user experience and effectively match users with suitable service providers.
- **Service Provider Data:** Encompasses information on availability, expertise, and reviews for both agricultural workers and householders to ensure accurate and efficient service matching.
- **Marketplace Data:** Consists of product listings, pricing, and transaction history for agricultural supplies to manage inventory and facilitate purchases.
- **Partner Shop Information:** Data related to partnered shops for handling deliveries, including their service areas and availability.

10.3 Algorithms/Frameworks/Software

1) Algorithms:

- **Search and Ranking Engines:** These algorithms are designed to quickly find the services users need, delivering the most relevant results and recommendations.
- **Recommendation Systems:** By understanding user preferences, these systems suggest the best matches for agricultural workers and householders, making the process smooth and personalized.
- **Matchmaking Algorithms:** These efficiently pair householders with the right agricultural workers based on their needs, acting like a helpful guide.
- **NLP:** Powers the in-app messaging, ensuring communication is clear and natural.

2) Frameworks and Software:

- **Mobile App Development:**
 - **Frontend:** React Native or Flutter creates an app that feels consistent across devices.
 - **Backend:** Node.js or Django keeps everything running smoothly behind the scenes.
- **Database Management:**
 - **Relational Databases:** PostgreSQL or MySQL organizes and stores structured data.

- **NoSQL Databases:** MongoDB handles flexible and less structured data.
- **APIs:** Connect the app with other services to provide a seamless experience.
- **Cloud Services:** AWS, Google Cloud, or Azure offers scalable infrastructure to grow as more users join.
- **Payment Processing:** Stripe or PayPal ensures secure and hassle-free transactions.

10.3 Teams Required

Product Development:

- **Software Engineers:** Develop the app and manage backend systems.
- **Data Scientists:** Create recommendation models and analyse data.
- **UX/UI Designers:** Design a user-friendly and attractive interface.

Operations:

- **Community Coordinators:** Manage partnerships with agricultural workers and householders.
- **Customer Support Representatives:** Assist users and address inquiries.

Business Development:

- **Partnership Managers:** Build and maintain relationships with partner shops and service providers.
- **Marketing Specialists:** Promote the app and attract new users.

Administration:

- **HR and Administrative Staff:** Handle recruitment, office management, and admin tasks.
- **Legal Advisors:** Manage legal agreements and ensure compliance

10.4 Cost

Initial Development Costs:

- **App Development:** Design and launch the app.
- **Infrastructure:** Servers, databases, and APIs.

- **Design:** UX/UI creation.

Ongoing Operational Costs:

- **Salaries:** Team of developers, support staff, and coordinators.
- **Partnership Management:** Managing relationships with service providers and shops.
- **Marketing:** User acquisition and promotion.
- **Maintenance:** Updates, server costs, and security.
- **Office/Admin:** Office space and admin expenses.

Other Costs:

- **Partnership Agreements:** Costs based on agreements with partner shops.
- **Insurance and Legal:** Coverage and legal services.

11. Code Implementation

The code for this analysis is available on GitHub: [GitHub Repository Link](#)

The models and analysis were developed using simulated data, as the app idea is new and no existing data is available at this stage. Detailed evaluation of the models is not yet complete and will require real datasets for a more thorough assessment.

12. Conclusion

Inspired by the everyday challenges faced by our community, this app is designed to address the needs of both local agricultural workers and householders. By connecting farmers and agricultural workers with nearby job opportunities, the app helps overcome income instability and provides a reliable source of work. At the same time, it empowers householders who wish to start home farming or gardening by linking them with skilled individuals who can assist with their projects.

Our platform not only enhances job opportunities and supports local agriculture but also promotes healthier living through home-based farming. By bridging these gaps, the app fosters a stronger connection between agricultural workers and the community, creating a win-win solution that benefits everyone involved.