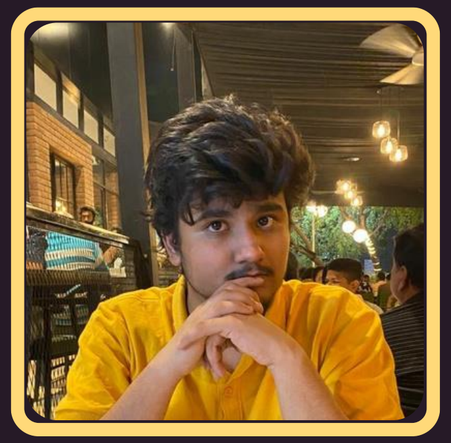
SOIL FERTILITY

&

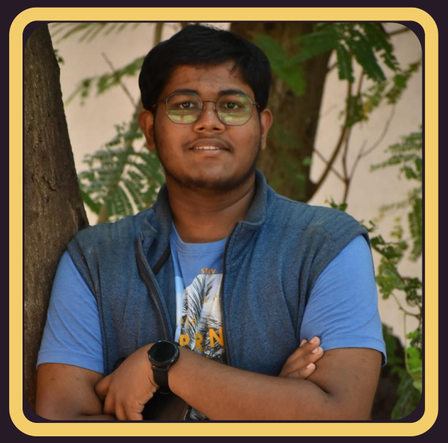
ANALYSIS KIT

The Team



Soham Deshpande

2nd year engineering student at PICT. Beginner in Data Science and Django Backend development.

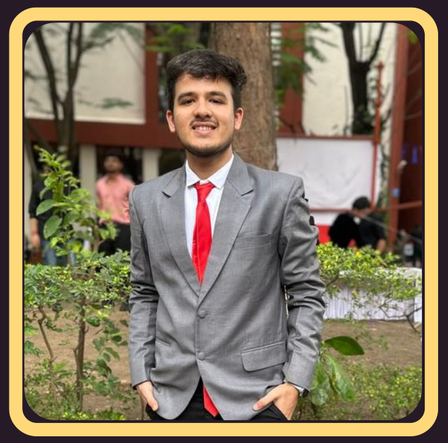


Shrihari Kulkarni

2nd year student at PICT Beginner in VLSI Designing. Have a pretty decent knowledge of Embedded Systems, IoT, and PCB Designing.

Prasad Chaudhari

2nd year student at PICT. Beginner in ML and have a decent knowledge of MySQL, PHP, HTML, and CSS.



Romank Sadhwani

2nd year student at PICT. Beginner in phpMyAdmin, MySQL, Data Science, Microsoft Certified for Azure AI fundamentals. Curious to learn new technologies.

PROBLEM

Some of the current problems faced during soil fertility analysis are imbalanced application of fertilizers, low or nil organic matter addition, spatial and temporal variations in soil fertility, and inadequate or inaccurate soil testing methods.

SOLUTION

To address these challenges, farmers should adopt balanced and integrated nutrient management, regular and proper soil testing, site-specific and precision nutrient management

Our product is an inexpenxive, easy-to-use soil parameter tester that communicates this data with our online portal which uses a trained ML model to continuously provide suggestions for the agricultural process to make the process sustainable.

OUR PRODUCT/SERVICE

Imagine you're a farmer, and you want to know which crops will grow best in your soil. We're going to use some special information about your soil to help you with this.

1.NPK (Nitrogen, Phosphorus, Potassium): Think of NPK as the food that plants need to grow. Just like humans need a balanced diet, plants need the right amount of these three nutrients. Nitrogen (N) helps plants grow leaves and stems. Phosphorus (P) helps with strong roots and flowers. Potassium (K) helps plants fight diseases and grow strong overall.

2.pH (Soil Acidity/Alkalinity): pH is like a measure of how sour or sweet your soil is. Low pH (acidic) soil is like sour food and might be good for some plants. High pH (alkaline) soil is like sweet food and suits different plants.

3.EC (Electrical Conductivity): This is like checking how salty your soil is. Some plants like a little salt, and some dont.
4.TDS (Total Dissolved Solids): TDS measures everything that's dissolved in your soil, including minerals and salts. It's related to EC and tells you how "crowded" your soil is with stuff that plants need.

So, by understanding these things about your soil, we can recommend the right plant diet for your garden, making sure it gets the right nutrients, acidity, and saltiness for those plants to grow happily.

So, you tell us these things about your soil, and we'll use a computer program to give you a list of plants that are most likely to grow well in your soil. It's like having a gardening expert on your computer!

And the more we learn over time about how well these plants grow in your area, the better our suggestions will get. So, it's like having a wise gardening friend who gets smarter with every season.

N	P	K	Temperature	Humidity	ph	Rainfall	Label
69	55	38	22.70883798	82.639414	5.700806	271.3249	rice
76	44	17	20.41683147	62.554248	5.855442	65.27798	maize
58	70	84	20.6543203	16.608208	6.231049	74.66311	chickpea
2	75	22	23.89271875	61.787794	6.658605	52.5573	lentil
16	15	42	19.67832052	89.089357	6.890784	108.5469	pomegranate
95	82	48	27.39489579	83.31172	5.719015	92.78134	banana
14	131	198	33.4641162	83.86743	5.562791	67.92204	grapes

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- Small to medium scale farmers with 2-6 acres land
- Government agencies (B2G)
- Horticulture and gardening sector for specialized versions of the model.

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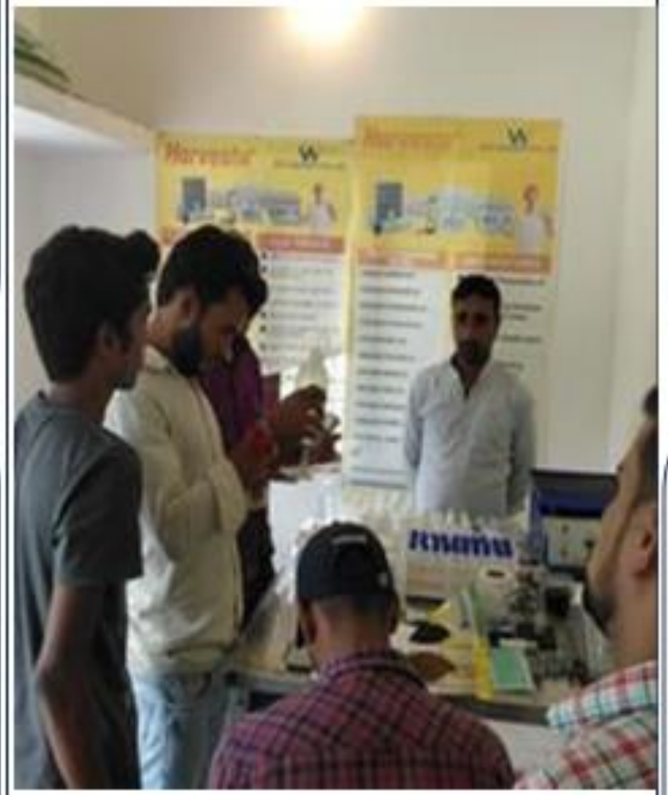

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- Affordable soil testing kit
- Crop suggestion using ML model
- Real time NPK estimation
- No human intervention

3

- Costly soil testing procedures
- Too much time required for reliable soil tests.
- Human error in traditional methods.
- Gap in generational knowledge and modern tech.

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- time saved – 25% faster
- cost reduction -- ~14% reduction
- physical / cognitive effort reduced -- Gives detailed analysis on reliable data.

UNIQUE SELLING PROPOSITION

The following characteristics make our solution a never before solution:

- Real-time NPK value estimation based on vast dataset.
- ML-driven Crop Recommendations.
- Efficient and reliable results.

TARGET MARKET

We will use the following channels to get into the market:

- Farmers across various places in the country.
- Government agencies.
- Horticulture and the Gardening sector.
- Word of mouth.
- Complimentary kits and Educational services.

COMPETITION & BARRIER TO ENTRY

- The soil tester kit market is characterized by intense competition and notable barriers to entry. As demand for efficient and user-friendly soil testing solutions continues to grow, established players in the industry maintain a strong presence, leveraging brand recognition and extensive distribution networks.
- Key competitors often invest heavily in research and development to enhance product features, accuracy, and ease of use, creating a challenging landscape for new entrants. Additionally, the requirement for specialized knowledge in soil science, sensor technology, and data analysis poses a significant barrier to entry, as it necessitates substantial expertise and resources.
- Regulatory compliance and the need for reliable and accurate results further contribute to the complexity of new market participants. As a result, the soil tester kit market demands innovative approaches and continuous improvement to overcome competitive pressures and establish a foothold in the industry.

REVENUE MODEL

The revenue model for our product encompasses various streams to ensure both upfront and recurring income. To initiate customer engagement, we will implement a product licensing fee, charging users a one-time cost for access to the core features. Additionally, we plan to introduce a subscription model with different plans to cater to needs of horticulture and gardening sector, offering monthly or annual payment options. Continuous revenue will be generated through maintenance contracts, providing users with ongoing support, updates, and patches for a fixed fee.

Customization and consulting services will be available, allowing us to cater to specific client needs for an additional fee. Lastly, a free trial period will be implemented to entice potential customers, with the aim of converting trial users into paying subscribers by offering exclusive benefits or discounts.

MILESTONES

- Over the next **1-3 years**, our team aims to achieve several critical milestones as we progress from the current prototyping stage.
- In the initial **6-12 months**, our focus will be on refining the prototype based on user feedback and testing, addressing any usability or functionality issues, and conducting thorough performance and security assessments.
- Following this, we plan to release an alpha version of the product within the next **12-18 months**, targeting a limited audience to gather real-world feedback and insights.
- Subsequently, in the **18-24 month** timeframe, we intend to launch a beta version, expanding our user base beyond the initial testers and incorporating diverse feedback for further refinements.

- As we approach the **24-36** month mark, our primary objective is to launch the official, fully polished version of the product for general availability, backed by comprehensive marketing strategies and ongoing support mechanisms.

These milestones reflect our strategic roadmap for the next few years, emphasizing iterative development, user-centric improvements, and a focus on long-term growth and market presence.

“खेतों में सफ़लता, ज़मीन की जाँच से: किसानों के लिए एक बेहतर उपहार”

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