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THINK MERIT | THINK TRANSPARENCY | THINK SASTRA

REPORT ON

"SOLVING PROBLEMS USING CREATIVE THINKING TECHNIQUES & TOOLS "

Submitted for partial fulfillment of the requirements for

CREATIVE THINKING TECHNIQUES & TOOLS [MEC348M]

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DESIGN THINKING PROCESS	TOOLS USED
Research	Brainstorming, Storytelling
Analyze	Mind mapping
Ideate	Idea Sketching
Build	Prototype
Test	Evaluate and user feedback

TOOL-BRAINSTORMING

Brainstorming-a creative thinking technique that involves a group of people generating ideas to solve problems or create new concepts

RESEARCH

Research helps in identifying needs and locating issues to be solved through observation and research.

Research involves:

- OBSERVE
- EMPATHIZE
- STUDY
- NEED FINDING

TOOL - STORYTELLING

Story Telling: Storytelling in research humanizes data, making complex problems more relatable by providing context and emotional depth. It helps gather qualitative insights, communicate findings effectively, and foster empathy, engaging stakeholders in problem-solving more deeply.

Storyline: Raj, a farmer, realizes his overuse of fertilizer is damaging his soil and polluting the nearby river. With guidance from his neighbour, he adopts sustainable farming techniques, restoring his land's health and inspiring others to do the same.

ANALYZE

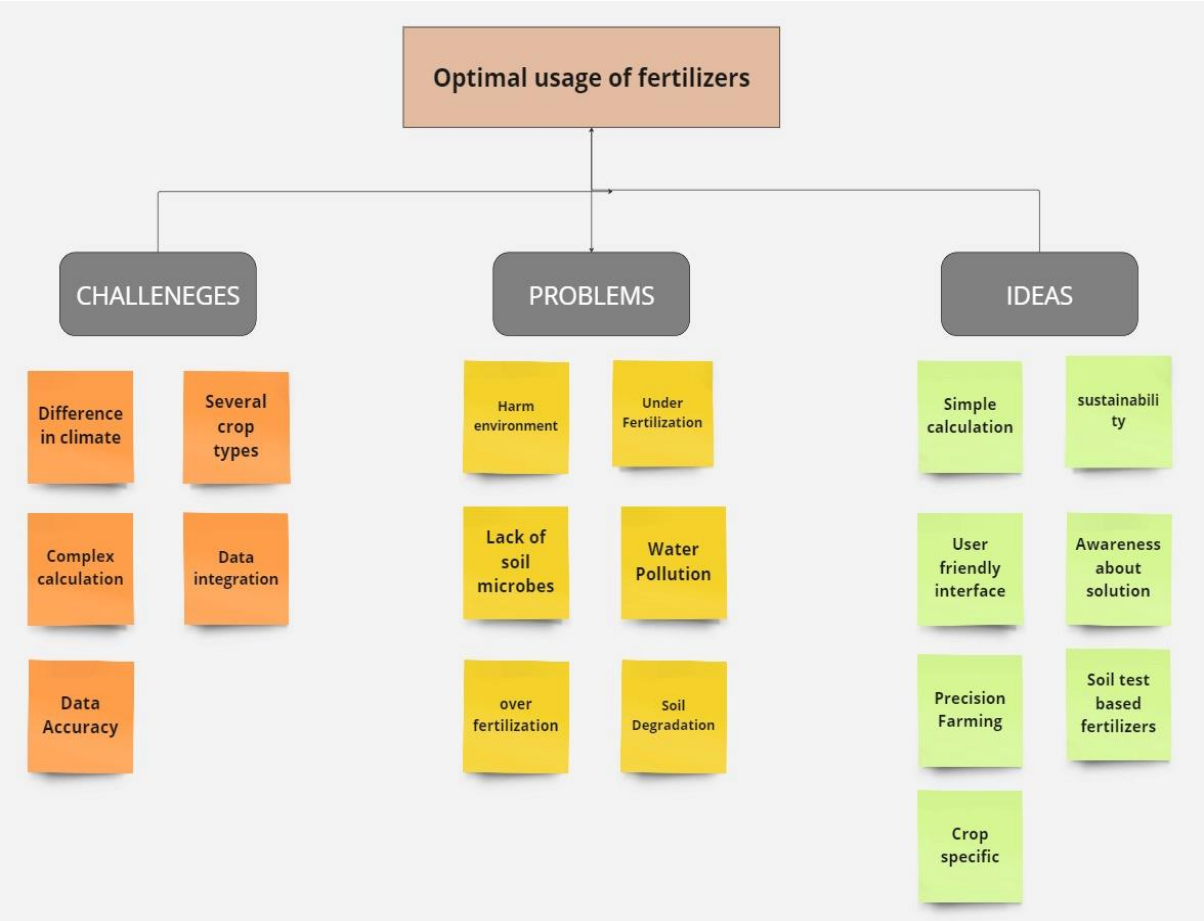
Analyzing helps to understand, define, and explore the problem area.

Analyze involves:

- UNDERSTAND
- SYNTHESIZE
- DEFINE
- VISUALIZE
- MAPPINGS

TOOL - MIND MAPPING

Mind Mapping: A visual technique for organizing information in a non-linear, hierarchical structure



PROBLEM DEFINITION

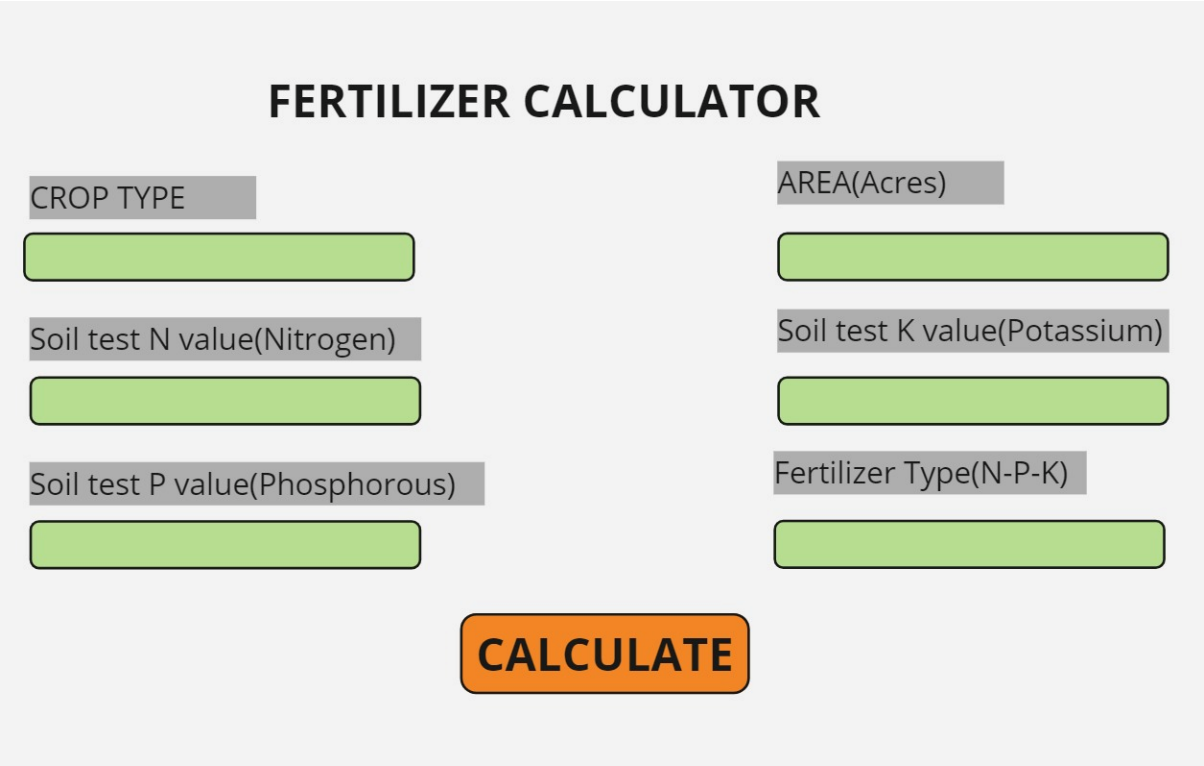
Inefficient fertilizer usage in agriculture is a common problem that leads to excessive resource consumption, environmental pollution, and suboptimal crop yields. Farmers often lack access to tailored recommendations based on specific soil conditions, plant types, and fertilizer formulations, resulting in either under- or over-application of fertilizers. This not only increases costs but also negatively impacts soil health and surrounding ecosystems. There is a critical need for a solution that provides farmers with precise, data-driven guidance on the optimal amount of fertilizer required for their specific conditions to maximize crop yield while minimizing environmental harm.

IDEATE

Ideate helps to come up with several alternate creative innovative solutions to the problem

Ideate involves

- CREATE
- EXPLORE
- EXPERIMENT
- CONCEPTS
- INNOVATE



SOLUTION

A web application that provides farmers with precise fertilizer recommendations based on various factors, including crop type, area size, and soil test results. The platform integrates data on soil nutrient content and crop nutrient requirements to generate customized fertilizer plans. Users input key parameters, and the system processes this information using agronomic formulas to suggest the optimal quantity of fertilizer for improved crop yield and sustainable soil management. This solution enhances productivity while minimizing the environmental impact of over-fertilization.

BUILD

Helps to build mock-ups, creating scenarios, prototyping, and detailing.

Build Involves

- DEVELOP
- DETAIL
- MOCK-UP
- PROTOTYPE

WEBSITE OVERVIEW

The Fertilizer Calculator website is an easy-to-use platform designed to help farmers optimize their fertilizer usage while protecting soil health and the environment. By providing personalized recommendations based on soil type, crop needs, and environmental conditions, the tool ensures that fertilizers are applied efficiently, reducing waste and minimizing negative environmental impacts such as water pollution or soil degradation.

KEY OBJECTIVES OF OUR WEBSITE

1. **Optimize Fertilizer Use for Sustainable Farming**: Provide tailored recommendations that help farmers apply the correct amounts of fertilizers, promoting sustainable agriculture practices that protect soil health and minimize environmental damage.

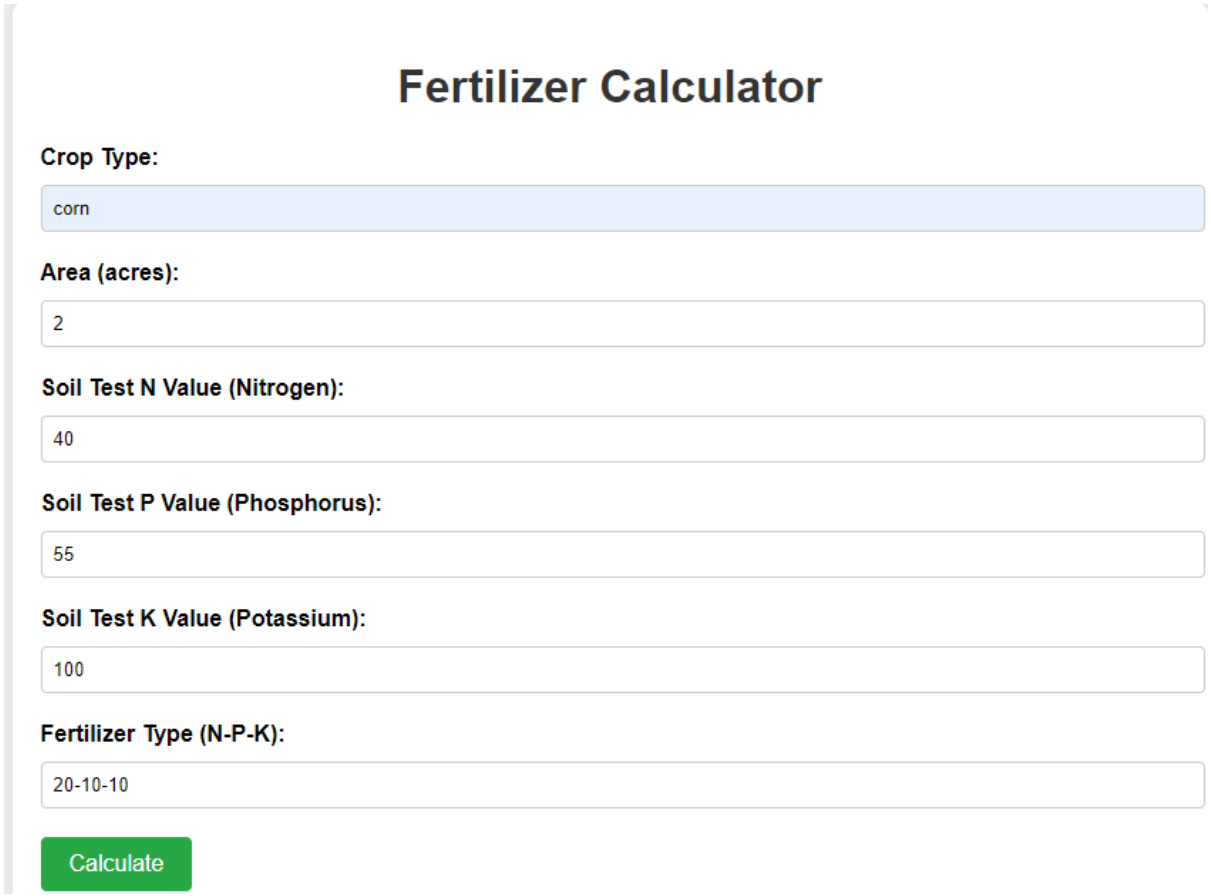
2. **Enhance Soil Health and Longevity**: Assist farmers in maintaining and improving the long-term fertility of their soil by promoting balanced nutrient applications, avoiding overuse, and encouraging soil-friendly practices.

3. **Reduce Environmental Impact**: Minimize harmful environmental effects, such as water contamination and soil degradation, by offering data-driven recommendations that prevent excess nutrient runoff and leaching.

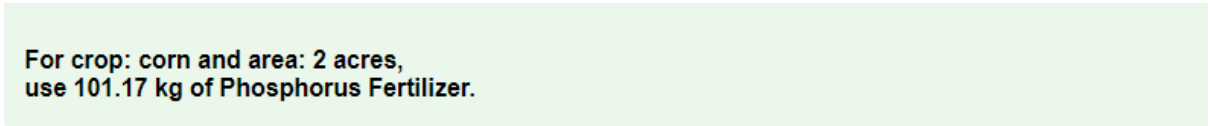
4. **Improve Cost Efficiency for Farmers**: Help farmers maximize yield while reducing unnecessary spending on fertilizers, enhancing their overall profitability and ensuring resource-efficient crop production.

5. **Promote Agricultural Education and Awareness**: Provide accessible resources, best practices, and guidelines that educate farmers about sustainable farming techniques, soil conservation, and environmentally-friendly fertilizer use.

PROTOTYPE-I



OUTPUT



TEST

User feedback on Prototype-I

After testing the first prototype, users suggested incorporating additional features to enhance usability and functionality:

1. FAQ Section:

Purpose: To address common questions and provide quick answers on how to use the calculator, input data, and understand the recommendations.

Feedback: Users requested this to reduce confusion, particularly for new users who may need clarification on soil types, crop input, or organic options.

2. User Feedback Feature:

Purpose: To allow ongoing user feedback, ensuring real-time insights for continuous improvement.

Feedback: Users suggested a feedback tool for reporting issues, providing suggestions, and sharing experiences directly within the platform.

3. User Guide:

Purpose: To offer a detailed, step-by-step guide on how to use the fertilizer calculator efficiently, including visuals and examples.

Feedback: Some users found the instructions unclear and recommended the inclusion of a user guide with detailed explanations and illustrations to help them input correct data and interpret results.

These additions will enhance the platform's user experience by providing more support and fostering a better understanding of how to use the tool effectively.

PROTOTYPE-II

OUTPUT

For crop: corn and area: 2 acres,
use 101.17 kg of Phosphorus Fertilizer.

FAQ User Guide Feedback

FAQ

Q: What does N-P-K stand for?

A: N-P-K represents the percentage of nitrogen (N), phosphorus (P), and potassium (K) in the fertilizer.

Q: How accurate is this calculator?

A: This calculator provides an estimation based on general guidelines for fertilizer application. It is recommended to consult with a local agronomist for specific recommendations.

Q: Can I use this calculator for crops other than corn?

A: Yes, you can use this calculator for various crops, but the nutrient requirements might vary. Make sure to adjust values accordingly.

FAQ User Guide Feedback

User Guide

Step 1: Enter the crop type you're planting. For example, enter "Corn".

Step 2: Specify the size of your farming area in acres. For example, if you have 5 acres, enter 5.

Step 3: Input your soil test results for nitrogen, phosphorus, and potassium. These values are crucial for accurate calculations.

Step 4: Specify the type of fertilizer you're using. Use the N-P-K ratio format, such as 20-10-10.

Step 5: Click "Calculate" to get the required fertilizer amount based on your inputs.

FAQ User Guide Feedback

User Feedback

Please leave your feedback:

Share your experience or suggestions...

Submit Feedback

USER FEEDBACK ON PROTOTYPE II

1. User-Friendly Interface

The platform's intuitive design allows users to navigate smoothly, even for those with limited technical experience.

2. Effective Guidance and Support

The new FAQ section and comprehensive user guide provide clear instructions and answers, making the tool more accessible to farmers.

3. Engaging Feedback System

Users can now offer real-time suggestions and report issues, ensuring constant improvements and user engagement.

4. Accurate and Tailored Recommendations

The calculator delivers precise fertilizer suggestions based on detailed crop and soil inputs, enhancing decision-making.

5. Enhanced Learning Resources

Educational materials on sustainable practices and soil health complement the tool, helping users grow their knowledge alongside their crops.

MORPHOLOGICAL CHART

Function	Option 1	Option 2	Option 3
User Interface (UI)	Simple and minimalistic	Modern and interactive	Data-driven dashboard
Fertilizer Recommendations	Based on crop type	Based on soil testing results	Based on weather patterns
Data Input	Manual entry by users	Automated via sensors	Mobile app integration
Educational Content	Blog articles and videos	Webinars and online courses	Interactive infographics
Feedback Mechanism	User reviews and comments	Surveys and quizzes	AI-generated suggestions
Visual Representation	Static charts and graphs	Interactive maps	Real-time monitoring dashboard
Environmental Impact Info	Static text	Calculators and tools	Visualized CO_2 savings
User Support	FAQ page	Live chat support	Community forum
Language Support	Local language options	Multilingual options	Auto-translation features
Mobile Compatibility	Responsive design	Mobile app	Progressive Web App (PWA)

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