

A Field Project Report on

VIRTUAL GARDEN PLANNER

Submitted

In partial fulfillment of the requirements for the award of the degree

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE and ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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VIGNAN'S FOUNDATION FOR SCIENCE, TECHNOLOGY & RESEARCH

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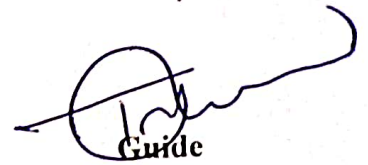
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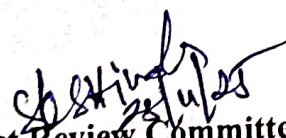
CERTIFICATE

This is to certify that the field project entitled "VIRTUAL GARDEN PLANNER" is being submitted by [A.Siri vennala], [231fa04945], [M.Harshitha], [231fa04953], [CH.Chandrika], [231fa04987], and [G.Asritha], [231fa04d29] in partial fulfilment of the requirements for the degree of **Bachelor of Technology (B.Tech.) in Computer Science and Engineering** at Vignans' Foundation for Science, Technology and Research (Deemed to be University), Vadlamudi, Guntur District, Andhra Pradesh, India.

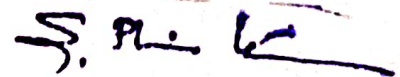
This is a bonafide work carried out by the aforementioned students under my guidance and supervision.



Guide



Project Review Committee



HoD, CSE

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DECLARATION

Date:16-04-25

We hereby declare that the work presented in the field project titled "VIRTUAL GARDEN PLANNER" is the result of our own efforts and investigations.

This project is being submitted under the supervision of T.Narasimha Rao, Assistant Professor, CSE in partial fulfillment of the requirements for the Bachelor of Technology (B.Tech.) degree in Computer Science and Engineering at Vignan's Foundation for Science, Technology and Research (Deemed to be University), Vadlamudi, Guntur, Andhra Pradesh, India.

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1. Introduction

A Virtual Garden Planner is an innovative, interactive tool designed to help you design, organize, and manage your garden from the comfort of your home. This digital solution allows you to visualize your garden layout, choose the right plants based on your space, climate, and preferences, and create a personalized garden plan.

Gardening is a rewarding and creative pursuit, but planning and designing a garden layout can be a daunting task. To help gardeners visualize and organize their outdoor space, the Virtual Garden Planner has been developed, utilizing basic HTML to provide a simple, static grid interface that allows users to easily conceptualize and plan their ideal garden design, complete with placeholders for plants and customizable grid sections, making it a valuable resource for anyone looking to bring their garden vision to life.

1.1 Problem definition:

- The Virtual Garden Planner, created using only HTML, is a simple tool designed to help users visualize their garden layout through a static grid. With placeholders for plants and customizable grid sections, users can manually plan and organize their garden design. While it does not offer interactivity or dynamic features, it serves as an easy, non-interactive way to conceptualize a garden layout.

Index Terms

1. Virtual Garden Planner
2. Garden Design
3. Garden Layout
4. Static Grid
5. HTML Application
6. Gardening Tool
7. Non-Interactive
8. Garden Planning

1.2 Existing system:

Garden Planner (by Small Blue Printer)

Garden Planner is a simple drag-and-drop garden design software that allows users to create their own garden plans. It provides a variety of plants, trees, and garden features that can be placed in a grid-based interface.

Features:

Extensive plant library
Drag-and-drop interface
Ability to add garden structures like fences, sheds, and paths
Option to export designs

Platform: Desktop (Windows, macOS) and Web-based version

Plan-A-Garden (by Better Homes & Gardens)

A free online tool that helps users design their garden by selecting plants and customizing the layout. It's easy to use and perfect for gardeners who want to quickly plan their garden designs.

Features:

Large selection of plants and garden structures
Ability to drag and drop elements
Customizable layouts
Visualize different plant options

Platform: Web-based.

VegPlotter:

VegPlotter is a garden planner focused on vegetable and fruit gardens. It allows users to design their vegetable plot, track growth, and monitor harvest schedules.

Features:

Focus on vegetable and fruit gardening
Ability to plan garden layout with crop rotation in mind
Tracking of planting, growth, and harvest dates
Customizable grid interface

Platform: Web-based.

1.3 Proposed System:

The Virtual Garden Planner will be a basic HTML-based web tool that allows users to visualize and plan their garden design. The tool will feature a grid layout where users can manually place plant representations in a static format. It will be customizable based on user input, but with no interactive or dynamic features.

The project will use only HTML to create a grid layout (using <table> or <div> elements) with placeholders representing plants and garden features. It will offer a static visual representation of a garden layout with no interactive or dynamic functionality.

1.4 Literature Review:

Research papers have explored various aspects of virtual garden planning. For instance, "Virtual Garden Design" (2019) reviews existing tools and techniques, while "Web-Based Virtual Garden Planner" (2018) presents a web-based planner. Additionally, "Virtual Reality in Garden Design" (2020) explores the use of virtual reality in garden design.

Online resources and books have also contributed to the field. "Virtual Garden Planner" by Better Homes and Gardens and "Garden Plan Pro" by Garden Plan Pro are two online tools that allow users to create virtual garden plans. Books like "Virtual Garden Design" (2020) and "Garden Design: A Practical Approach" (2019) provide comprehensive guides to virtual garden planning and design.

2. System Requirements

These run in a browser, so they have minimal hardware requirements:

Operating System: Windows 7 or later, macOS, Linux, or ChromeOS

Processor

Intel Core i3 or AMD equivalent

RAM: 4GB minimum (8GB recommended)

Graphics Card

Integrated graphics (Intel HD 4000 or better)

Storage

No local storage needed (cloud-based)

Internet

Stable connection (5 Mbps or higher)

Browser

Chrome, Firefox, Edge, or Safari (latest versions)

2.1 Hardware Requirements:

- Processor: Intel Core i3 / AMD Ryzen 3 or better
- RAM: 4GB (8GB recommended)
- Graphics: Integrated GPU (Intel HD 4000 or newer)
- Storage: No local storage needed (uses cloud-based storage)
- Internet Speed: At least 5 Mbps (for smooth online experience)
- Display: 1280x720 resolution or higher.
- Software Requirements:
- Operating System: Windows 7 or later, macOS, Linux, ChromeOS
- Browser: Chrome, Firefox, Edge, or Safari (latest versions)
- Plugins: JavaScript enabled, WebGL supported.
- Frontend: React.js / Vue.js (for UI)
- Backend: Node.js / Python (Django, Flask)
- Database: PostgreSQL / MongoDB

Browser Compatibility:

The application is designed to run efficiently on modern web browsers:

- Google Chrome
- Mozilla Firefox
- Microsoft Edge

These browsers offer optimized JavaScript execution, enhanced security, and better rendering capabilities, ensuring a seamless user experience

3. System Design

The Virtual Garden Planner system follows a modular design, ensuring better maintainability and scalability. It separates different components for an efficient and user-friendly experience. The system ensures seamless tracking of fitness activities, progress monitoring, and goal-setting while maintaining responsiveness across various devices and browsers.

3.1 System Module:

User Management Module User Registration & Login (email, social login, or guest access)
User Profile Management (preferences, saved gardens, themes) Role-Based Access (admin, premium user, guest).

Garden Design Module Drag-and-Drop Interface for placing plants, trees, furniture, and pathways
2D & 3D Visualization for real-time garden preview Terrain Editing (adjust land elevation, add water bodies, etc.) Custom Object Import (upload 3D models or textures).

Plant Database & Recommendations Module Plant Catalog with details (growth conditions, season, watering needs) AI-Based Plant Suggestions based on location, climate, and soil type
Search & Filter Options for quick selection of plants and garden elements.

Climate & Environment Module Weather Data Integration (real-time temperature, rainfall, and sunlight tracking) Soil Type Selection for better crop recommendations Watering & Irrigation Planning (automatic irrigation scheduling).

3.2 UML Diagrams:

State digram:

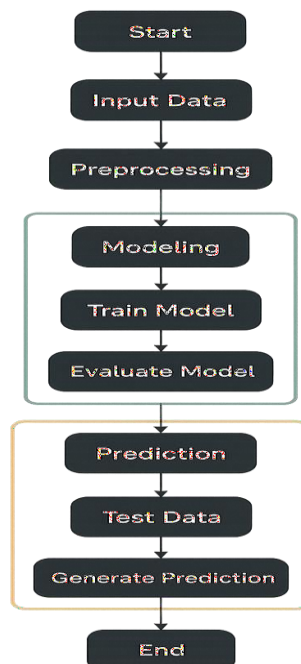


Fig 3.2.1

Class diagram:

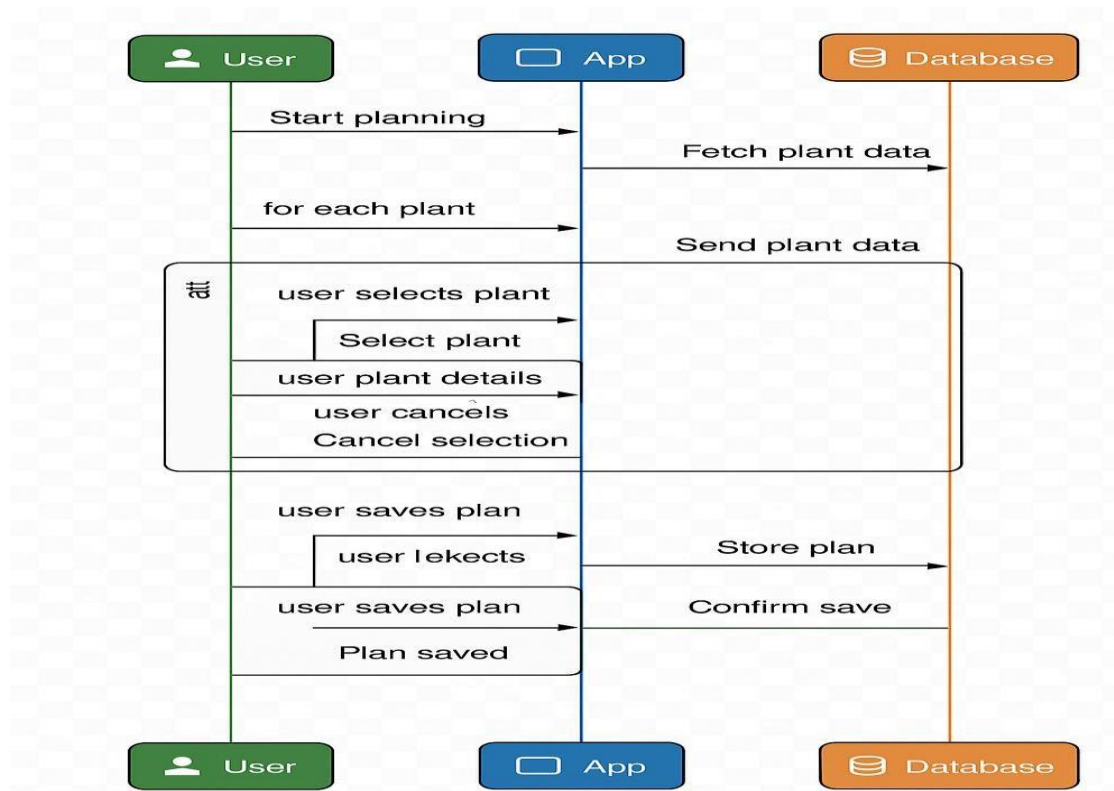
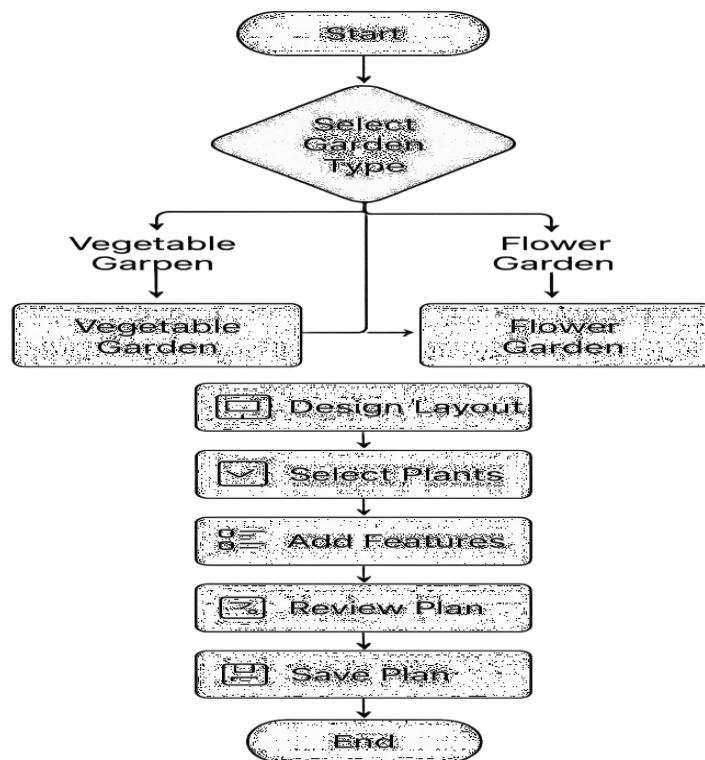


Fig 3.2.2

Activity diagram:



4 Implementation

4.1 Sample Code

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Garden Fields</title>
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
<style>
body {
background-color: #fdeee3;
}
.hero {
background-color: #2e582c;
color: white;
text-align: center;
padding: 50px 20px;
}
.card {
border: none;
box-shadow: 0px 4px 8px rgba(0, 0, 0, 0.1);
}
</style>
</head>
<body>
<nav class="navbar navbar-expand-lg navbar-dark bg-success px-3">
<a class="navbar-brand" href="#">Garden Fields</a>
<button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-
target="#navbarNav">
<span class="navbar-toggler-icon"></span>
</button>
<div class="collapse navbar-collapse" id="navbarNav">
<ul class="navbar-nav ms-auto">
<li class="nav-item"><a class="nav-link" href="#">Home</a></li>
<li class="nav-item"><a class="nav-link" href="#">About</a></li>
<li class="nav-item"><a class="nav-link" href="#">Plants</a></li>
<li class="nav-item"><a class="nav-link" href="#">Weather</a></li>
<li class="nav-item"><a class="nav-link" href="#">Journal</a></li>
<li class="nav-item"><a class="nav-link" href="#">Design</a></li>
<li class="nav-item"><a class="nav-link" href="#">Help </a></li>
<li class="nav-item"><a class="nav-link" href="#">Contact </a></li>
</ul>
</div>
</nav>
```

```

<div class="hero">
<h1>Welcome to Your Digital Garden</h1>
<p>Transform your gardening experience with our comprehensive suite of tools.</p>
</div>
<div class="container text-center my-5">
<h2>What We Offer</h2>
<div class="row mt-4">
<div class="col-md-4">
<div class="card p-3">
<h4>Garden Planning</h4>
<p>Design your perfect garden with our intuitive planning tools.</p>
<button class="btn btn-success">Start Planning</button>
</div>
</div>
<div class="col-md-4">
<div class="card p-3">
<h4>Plant Library</h4>
<p>Access our comprehensive database of plants and care guides.</p>
<button class="btn btn-success">Explore Plants</button>
</div>
</div>
<div class="col-md-4">
<div class="card p-3">
<h4>Garden Journal</h4>
<p>Track your garden's progress and maintain detailed records.</p>
<button class="btn btn-success">Start Journaling</button>
</div>
</div>
</div>
</div>
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Garden Fields</title>
  <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css">
  <link rel="stylesheet" href="styles.css">
</head>
<body>
  <nav class="navbar navbar-expand-lg navbar-dark bg-success px-3">
    <a class="navbar-brand" href="#">Garden Fields</a>
    <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-
target="#navbarNav">

```

```
<span class="navbar-toggler-icon"></span>
</button>
<div class="collapse navbar-collapse" id="navbarNav">
  <ul class="navbar-nav ms-auto">
    <li class="nav-item"><a class="nav-link" href="#">Home</a></li>
    <li class="nav-item"><a class="nav-link" href="#">About</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Plants</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Weather</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Journal</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Design</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Help</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Contact</a></li>
  </ul>
</div>
</nav>

<div class="hero">
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  <p>Transform your gardening experience with our comprehensive suite of tools.</p>
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  <h2>What We Offer</h2>
  <div class="row mt-4">
    <div class="col-md-4">
      <div class="card p-3">
        <h4>Garden Planning</h4>
        <p>Design your perfect garden with our intuitive planning tools.</p>
        <button class="btn btn-success">Start Planning</button>
      </div>
    </div>
    <div class="col-md-4">
      <div class="card p-3">
        <h4>Plant Library</h4>
        <p>Access our comprehensive database of plants and care guides.</p>
        <button class="btn btn-success" onclick="fetchPlants()">Explore Plants</button>
      </div>
    </div>
    <div class="col-md-4">
      <div class="card p-3">
        <h4>Garden Journal</h4>
        <p>Track your garden's progress and maintain detailed records.</p>
        <button class="btn btn-success">Start Journaling</button>
      </div>
    </div>
  </div>
</div>

<script src="script.js"></script>
```

```
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>
body {
```

```
    background-color: #fdeee3;
}
```

```
.hero {
    background-color: #2e582c;
    color: white;
    text-align: center;
    padding: 50px 20px;
}
```

```
.card {
    border: none;
    box-shadow: 0px 4px 8px rgba(0, 0, 0, 0.1);
}
```

```
const express = require('express');
const mongoose = require('mongoose');
const cors = require('cors');
```

```
const app = express();
app.use(express.json());
app.use(cors());
```

```
// Connect to MongoDB
```

```
mongoose.connect('mongodb://localhost:27017/garden', { useNewUrlParser: true,
useUnifiedTopology: true })
    .then(() => console.log('MongoDB Connected'))
    .catch(err => console.log(err));
```

```
// Plant Schema
const PlantSchema = new mongoose.Schema({
  name: String,
  type: String,
  care: String
});
const Plant = mongoose.model('Plant', PlantSchema);

// Journal Schema
const JournalSchema = new mongoose.Schema({
  title: String,
  entry: String,
  date: { type: Date, default: Date.now }
});
const Journal = mongoose.model('Journal', JournalSchema);

// Routes
app.get('/plants', async (req, res) => {
  const plants = await Plant.find();
  res.json(plants);
});

app.post('/plants', async (req, res) => {
  const plant = new Plant(req.body);
  await plant.save();
  res.json({ message: 'Plant added' });
});

app.get('/journal', async (req, res) => {
  const journalEntries = await Journal.find();
  res.json(journalEntries);
});
```

```
app.post('/journal', async (req, res) => {  
  const journal = new Journal(req.body);  
  await journal.save();  
  res.json({ message: 'Journal entry added' });  
});  
  
// Start Server  
  
app.listen(3000, () => console.log('Server running on port 3000'));
```

4.2 Test Cases:

- TC01**-Registration and login worked as expected with valid credentials.
- TC02**-Error messages appeared for missing fields (e.g., empty email or password).
- TC03**-The "Forgot Password" function sent a password reset link successfully.
- TC04**-The drag-and-drop feature worked smoothly without any issues.
- TC05**-Switching between 2D and 3D views worked seamlessly
- TC06**-The search function returned relevant plant results as expected.

UI/UX Test Cases:

- TC07**-The search and import functionality worked as expected.
- TC08**-The design saved correctly and loaded after reopening.
- TC09**-The system loaded saved designs without issue.
- TC10**-Plant growth simulation worked, and users could view plant growth progress.
- TC11**-Reports were generated successfully, and exported as PDF.
- TC12**-Sharing functionality worked, and users successfully shared designs.

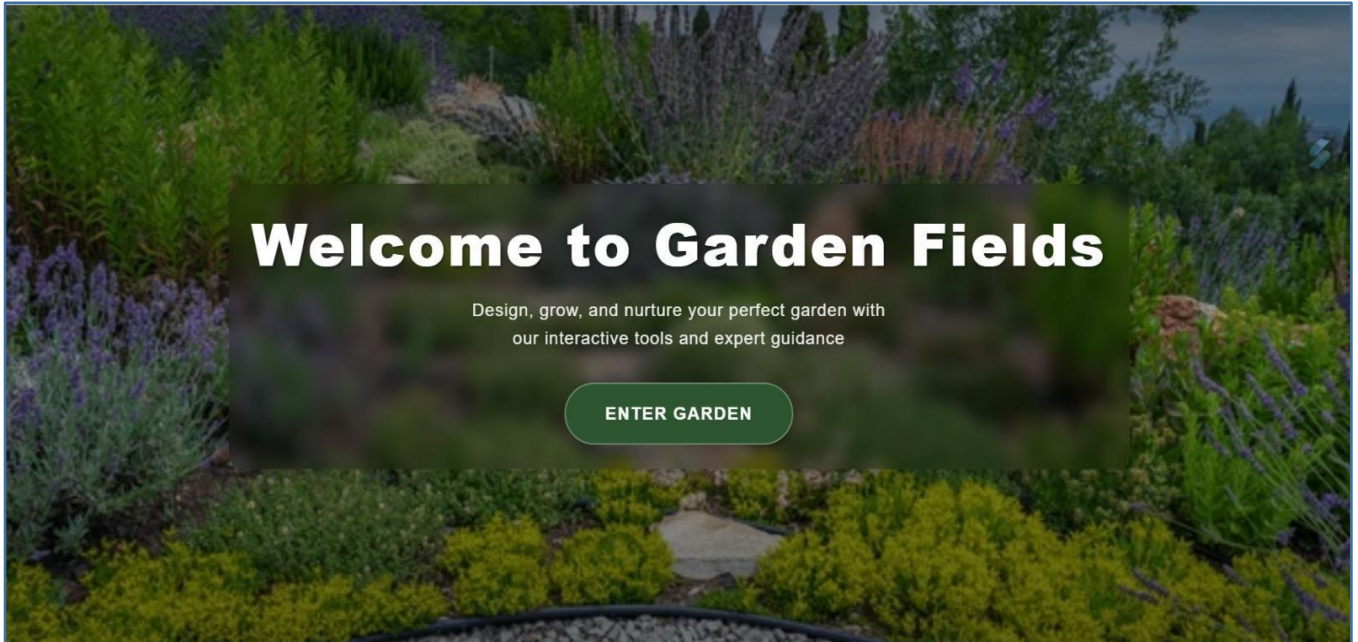
Performance and Error handling:

- TC13**-The app loaded in 4 seconds, which is acceptable for optimal performance.
- TC14**-The garden design page loaded in 2.5 seconds, performing as expected.
- TC15**-The search took 2.8 seconds to load, performing efficiently with large data.
- TC16**-The simulation ran smoothly with 12 plants, no lag observed.
- TC17**-The design saved in 4 seconds and loaded instantly upon reopening.
- TC18**-UI remained responsive under rapid interaction, no lag or freezing.
- TC19**-The system displayed "Invalid username/password" error as expected.

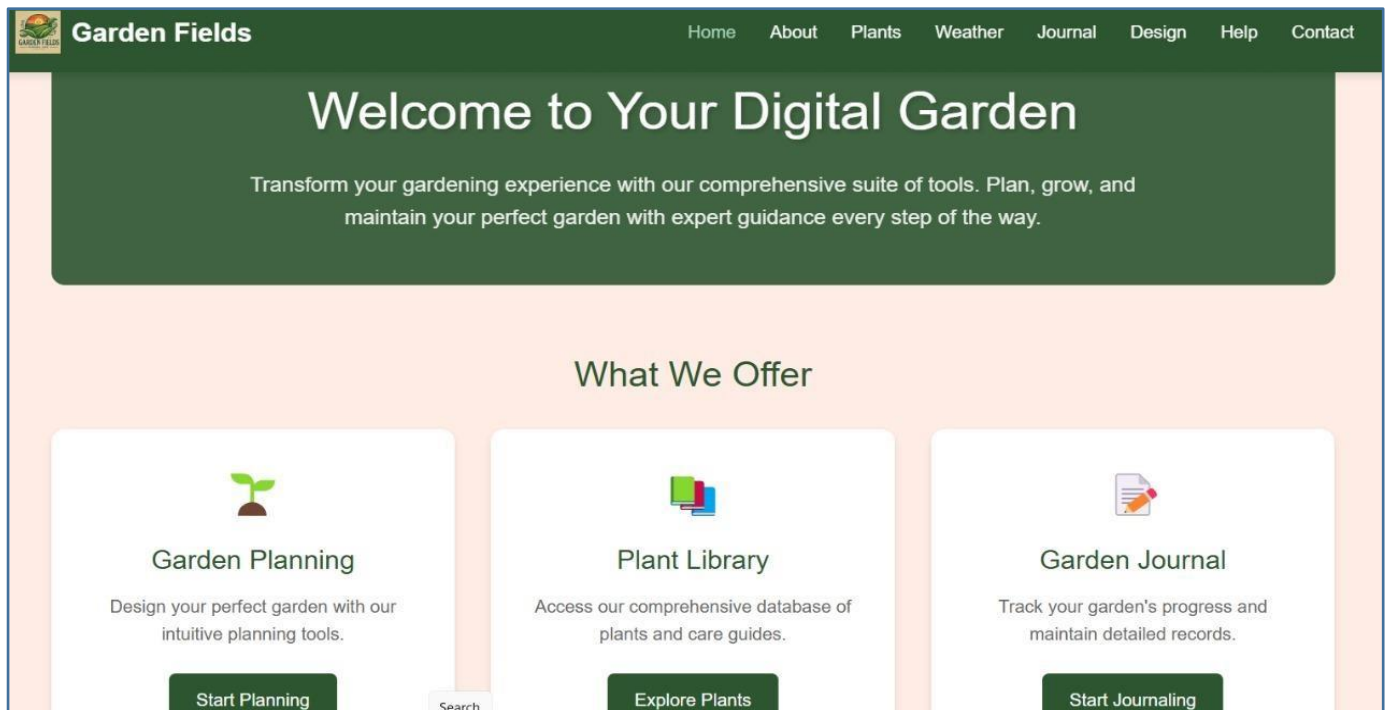
5. Results

5.1 Output Screenshots


Start Page:



Home Page:



Journal Page:

 **Garden Fields**

[Home](#) [About](#) [Plants](#) [Weather](#) [Journal](#) [Design](#) [Help](#) [Contact](#)

Garden Journal

Date

04-04-2025

Title

First Signs of Spring

Content

Today I noticed the tulips starting to push through the soil.
The weather has been mild lately, and the soil is warming up.
I also planted some lettuce seeds in the raised bed.


Add Entry

First Signs of Spring2025-04-04

Today I noticed the tulips starting to push through the soil. The weather has been mild lately, and the soil is warming up. I also planted some lettuce seeds in the raised bed. Looking forward to seeing how they sprout over the next few days!

EditDelete

Help Page:

 **Garden Fields**

[Home](#) [About](#) [Plants](#) [Weather](#) [Journal](#) [Design](#) [Help](#) [Contact](#)

Search for help...

All

Getting Started

Features

Plants

Account

How do I create a new garden?

+

Can I track multiple gardens?

+

How do I use the weather feature?

+


How do I add plants to my garden?

+

What should I do if I forget my password?

+

Plants Page:

 Garden Fields

[Home](#) [About](#) [Plants](#) [Weather](#) [Journal](#) [Design](#) [Help](#) [Contact](#)

Sort By:

Original

Filter By Region:

All

Filter By Category:

All


Cactus

Tomato

Red Roses

Yellow Roses

Cactus (Cactaceae)



Size: 8 ft

Water Required: 12

Shade Conditions: NONE, LIGHT, PARTIAL

Flowering Period: Mid-Spring


Region: Global

Price: 700

Category: Cacti

Edit Plant

Contact Page:

 Garden Fields

[Home](#) [About](#) [Plants](#) [Weather](#) [Journal](#) [Design](#) [Help](#) [Contact](#)

Contact Support

Name

chandrika

Subject

Pesticide Problems in the Garden


Message


Today I found several of my vegetable plants—especially the tomatoes and peppers—showing signs of leaf curling and discoloration. After some research, I suspect it's due to pesticide drift from a nearby field.

Send Message

Get in Touch

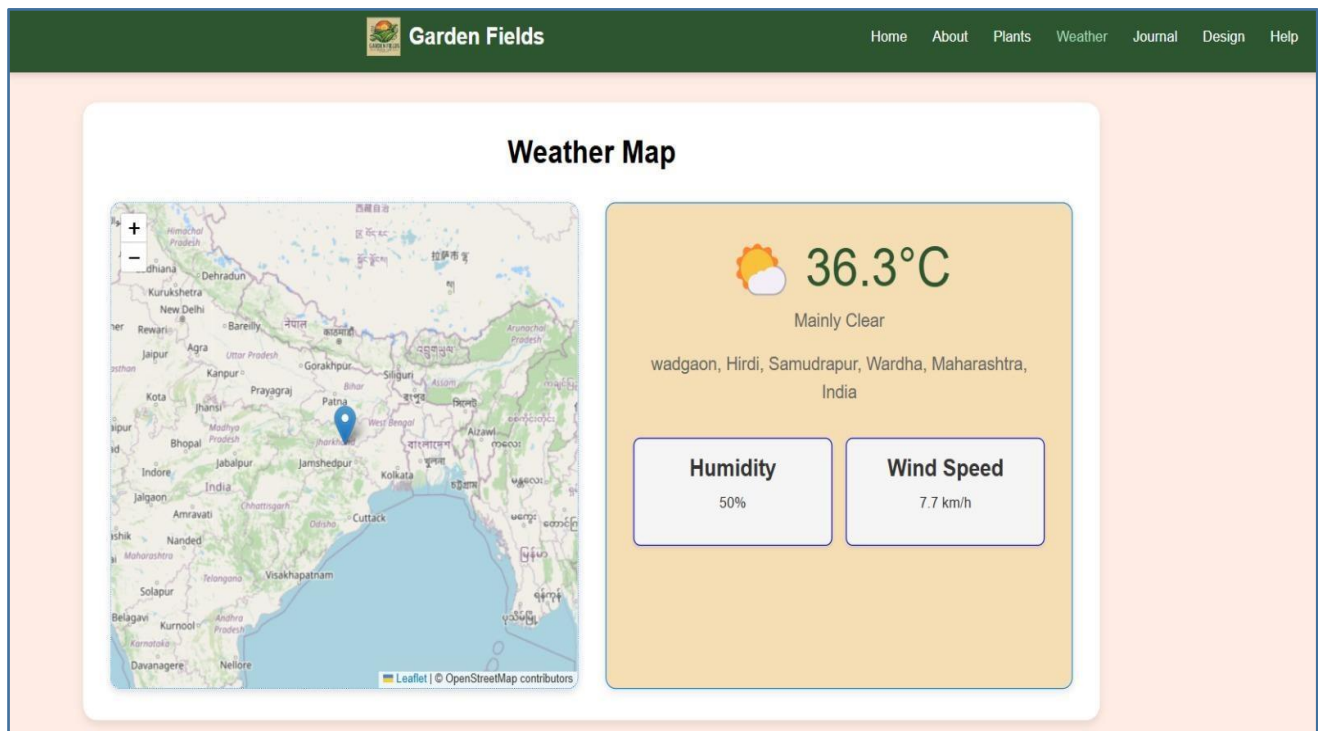
Have questions about Garden Fields? Need help with a specific feature? Our support team is here to help you get the most out of your gardening experience.

 Phone: +91 9876543210

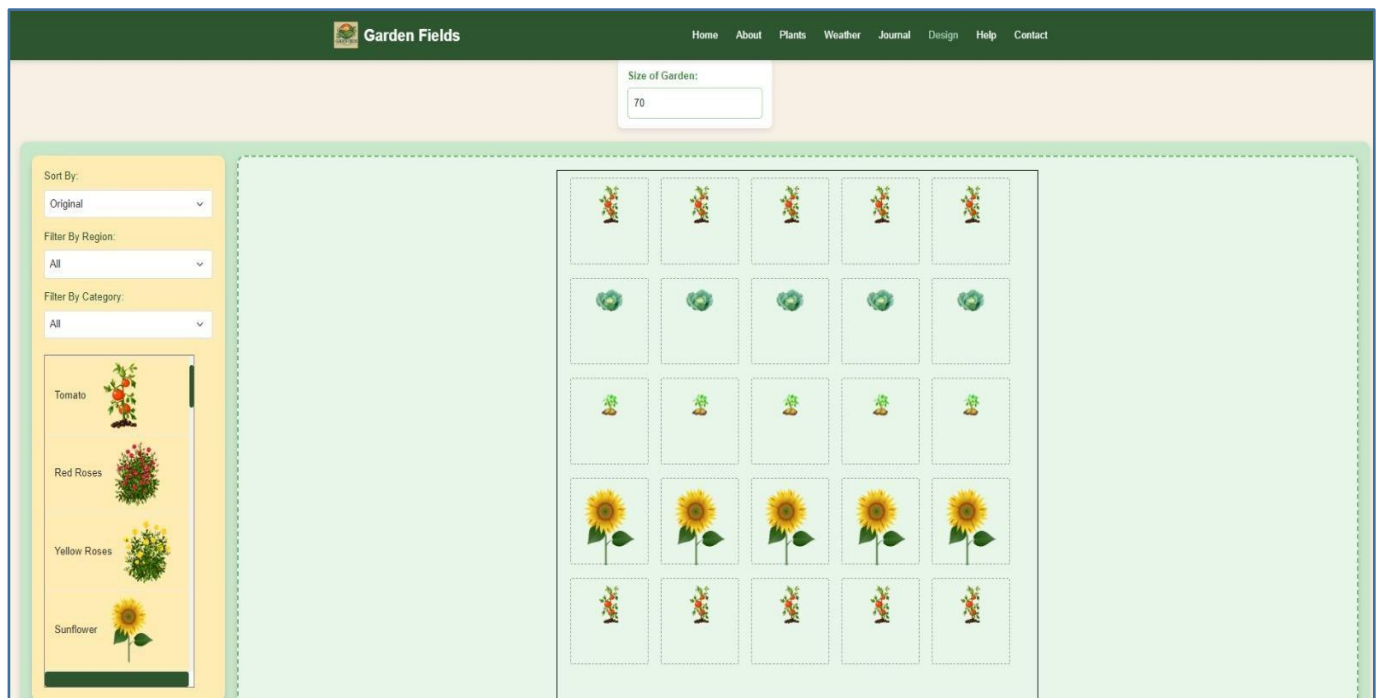
 Hours: Monday - Friday, 9am - 5pm

For immediate assistance, please check our FAQ section or send us a message using the contact form. We typically respond within 24 business hours.

Weather Page:



Design Page:



6. Conclusion

In conclusion, this project showcases the development of a **Virtual Garden Planner** using **HTML**, **CSS**, **JavaScript**, and the **Konva.js library**. The application allows users to input garden dimensions and plant preferences, generating a personalized virtual garden layout. The use of Konva.js ensures smooth, interactive graphics that enhance the user experience, making it easy for gardening enthusiasts to visualize and design their gardens.

This project emphasizes the potential of web-based applications to provide interactive, user-friendly tools for garden planning. It empowers users to experiment with various designs and plant types, offering a risk-free environment to explore their gardening ideas. The ability to visualize the garden layout before planting can lead to more thoughtful, efficient planning and better gardening outcomes.

While the current version serves as a basic framework, there are many opportunities to enhance the application further. Future improvements could include features such as saving and loading garden designs, expanding the plant database to include more options and detailed plant information, and adding customization tools to give users more control over their garden's appearance. Integrating a database for storing user designs and plant data could enable users to track and share their gardens over time, while location-based features could provide personalized recommendations based on local climate and soil conditions.

Additional features like mobile compatibility, educational resources for gardening tips, and responsive design could make the application more accessible and practical for a broader range of users. These enhancements would transform the **Virtual Garden Planner** from a simple planning tool into a comprehensive gardening resource, supporting users in every stage of garden design and maintenance.

Overall, this project provides a strong foundation for a **Virtual Garden Planner** and illustrates the potential for web applications to enhance the gardening experience. By incorporating these additional features, the application could become a valuable tool for gardeners of all skill levels, offering them a unique and effective way to plan, visualize, and create their ideal gardens.

7. References

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Firebase Documentation. (n.d.). *Firebase Realtime Database*

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This list includes the most essential references regarding the core technologies used in the **Virtual Garden Planner** project, including HTML, CSS, JavaScript, Konva.js, plant databases, and web storage/database solutions.

PROJECT LINK:

<https://github.com/Chandhu-987/garden-plannig.git>
