

Lab 1 - CropCircles Product Description

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1. Introduction

Societal Problem

The effectiveness of harnessing a garden's potential and transforming its yields into a wide range of post harvest products is contingent on addressing knowledge gaps, utilizing proper community resources, and fostering individual motivation.

- Gardening has seen a significant increase, with a 35% increase since 2021 (resource)
- 55% of American households participate in gardening activities (resource)
- Gardeners lack guidance on recipe ideas, hindering efficient use of harvested produce
- Only 20% of gardeners use a mobile app as a source of information
- 37% who use the internet spend more than 10 hours a week online
- There is a major gap in wine consumption and wine hobbyists
- 79 million Americans consume wine
- 500k North Americans make wine as a hobby
- Wine can be made from more than just grapes
- Strawberries are the most popular small fruit in a home garden
- 3lbs of strawberries will make 4 750ml (standard) bottles of wine

1. The Solution

To provide users with a central hub for product making and community driven growing solutions through the implementation of CropCircles, product forums that provide users with like minded individuals with similar growing goals where they can foster a sense of community.

- Users get access to product communities

- Users get product information that will help them make growing decisions
- User can post questions and provide answers to product and crop blogs/posts
- User can receive information on post-harvest procedures and techniques

2. CropCircles Product Description

CropCircles is a mobile application aimed at forming a community of gardeners for the purpose of post harvest product development.

2.1 Key Product Features and Capabilities - include the table of features and user role access

- CropCircles will provide users with a Q/A forum to generate posts and respond to other users posts
- CropCircles will provide users with a chat function for direct messaging with other CropCircle members
- CropCircles will provide users with a growing recommendations forum where users can provide information, they would like to share with the CropCircle about best growing practices.
- CropCircles will provide users with a growing updates forum where progress posts can be sent to encourage CropCircle discussions and encouragement amongst team members
- CropCircles will provide users with tracking features in the form of journaling and notes about logging growing information. Historical product completions will be stored for future reference by the user.

- CropCircles will provide users with a post-harvest forum for browsing recipe suggestions and providing recommendations on activities such as storage practices and handling techniques.

2.2 Major Components (Hardware/Software)

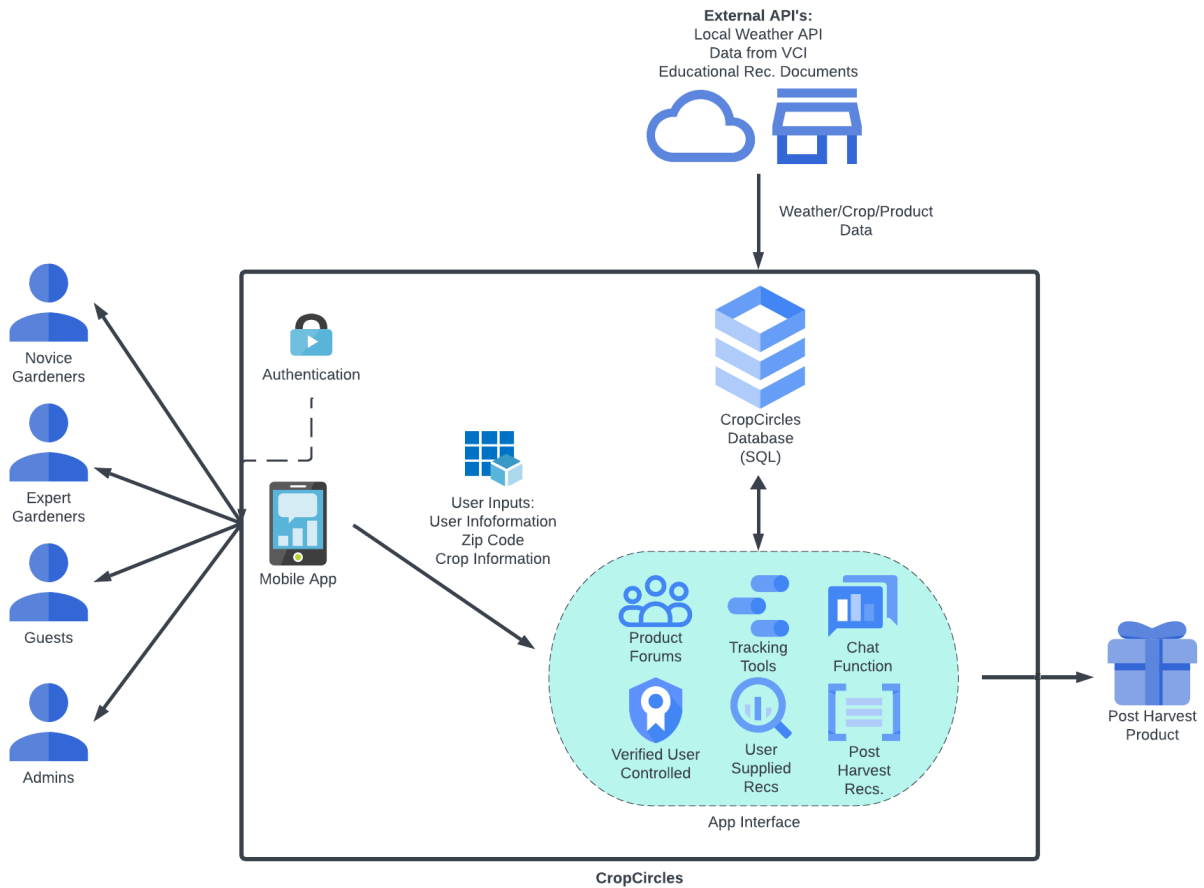


Figure 1: Main Functional Component Diagram

2.2.1 Hardware

- Android mobile device with internet connection

2.2.2 Software

- Innovative CropCircle Software
 - CropCircles product community finder
 - Chat functionality
 - CropCircle generator
- Backend Server - AWS/ODU
- Database - MySQL
- Programming Language - Java Script
- IDE - Visual Studio Code
- Testing - Gradle
- APIs - OpenWeatherMap
- Version Control - Git/GitHub
- Issue Tracking - Git/GitHub
- Continuous Integration - Git/GitHub
- Containerization - Docker

3. Identification of Case Study

The intended audience for CropCircles are novice gardeners, expert gardeners and individuals that show interest in browsing crop and product information without participating in the CropCircle groups. Novice gardeners experience frustration, difficulty and no knowledge about gardening. CropCircles can provide knowledge and guidance for gardeners to achieve in producing a successful garden. Expert gardeners experience intense passion and a desire to share their knowledge about gardening. CropCircles can provide forums that allow expert gardeners to express their viewpoints and help other novice gardeners grow their gardens.

- **Intended Users**

- Novice gardeners interested in making a product from their home grown harvest
- Expert gardeners interested in sharing their knowledge for passion about their craft - and to grow the community of artisans
- Users that would like to browse crop and product information without participating in CropCircle groups

- **Case Study Characteristics**

- The initial circle will contain a minimal number of users (10) with the following backgrounds
 - Users with no prior gardening experience
 - Users with standard growing experience
 - Users with growing proficiency
 - Users with certifiable growing expertise
 - artisans

- **Reduction in Scale: Expected user cases to be demonstrated in the prototype**

- Several (3) Varieties of Strawberries as the crop
- Two products, jam and wine
 - Recipes
 - Equipment

5. Glossary

- **Novice Gardener:** A gardener with limited formal training, education, or professional background in the subject matter, possessing some knowledge but lacking accreditation
- **Expert Gardener:** A gardening professional with certified expertise gained through formal education, training, or hands-on experience in product-related subjects. They lead and manage groups focused on specific gardening products
- **Product:** The end goal of a crop after harvesting, ranging from wine to jam or any other item that can be produced in the post-harvest stage
- **Harvest:** The point at which the crop is ready to be gathered for use
- **Post-Harvest:** The phase following the harvest, including the processes involved in transforming a crop into a product
- **Curing:** The controlled drying and conditioning process applied to certain crops, such as tobacco or onions, to enhance flavor, texture, or storage qualities
- **Fermentation:** A microbial process used in the post-harvest stage to transform certain crops, like cocoa or coffee beans, through the breakdown of compounds, often resulting in improved flavor or quality

- **Dehusking:** The removal of the outer husk or shell from a harvested crop, commonly applied to grains, nuts, or seeds
- **Brining:** The immersion of harvested produce, particularly fruits or vegetables, in a solution of salt and water to preserve, flavor, or enhance texture
- **Canning:** A preservation method involving the sealing of harvested food in airtight containers and heat processing to prevent spoilage, commonly used for fruits, vegetables, and sauces
- **Blanching:** A brief exposure of harvested vegetables to boiling water or steam, often followed by rapid cooling, to halt enzyme activity and preserve color, texture, and nutritional value
- **Pickling:** The preservation of harvested produce, typically cucumbers or other vegetables, in an acidic solution, often vinegar, along with various spices, to create pickles with a distinct flavor profile
- **Wine:** An alcoholic beverage produced through the fermentation of crushed grapes or other fruits, with variations in flavor, aroma, and complexity depending on the grape variety, region, and production techniques

- **Jam:** A sweet spreadable product made by cooking fruit with sugar to a gel-like consistency, often containing whole or pieces of fruit
- **Preserves:** Similar to jam, preserves are a sweet spread made by preserving whole or large pieces of fruit in a sugary syrup
- **Oils:** Extracted from fruits, seeds, or nuts, oils serve various culinary purposes. Olive oil, for example, is pressed from olives and is a common cooking and salad oil with distinct flavors based on the olive variety and processing methods
- **Syrup:** A thick, sweet liquid often made by boiling sugar or fruit juice, used as a topping for pancakes, waffles, desserts, or in beverages
- **Cider:** A beverage made from the fermentation of apple juice, resulting in a mildly alcoholic drink with various levels of sweetness and carbonation
- **Relish:** A condiment made from chopped fruits or vegetables, often pickled, and seasoned with spices, vinegar, or sugar, used to enhance the flavor of savory dishes
- **Community Forum:** A social feature in the gardening app that enables users to connect with other gardener users, share experiences, ask questions, and seek advice on various gardening topics

- **Plant Care Reminders:** Notifications and reminders within the app that alert users to water, fertilize, prune, or perform other care tasks for specific plants based on their individual needs and schedules
- **Weather Integration:** The incorporation of real-time weather data into gardening apps, offering users insights into current and forecasted weather conditions to assist in garden planning and care
- **USDA Hardiness Zones:** A zoning system created by the United States Department of Agriculture (USDA) to classify regions based on temperature extremes. Ranging from 1 (coldest) to 13 (warmest), these zones guide gardeners in selecting plants adapted to their local climate, ensuring successful cultivation
- **Mulching:** The practice of covering the soil around plants with a layer of organic or inorganic material (mulch) to conserve moisture, suppress weeds, and regulate soil temperature
- **Perennials:** Plants that live for more than two years, often returning each growing season, providing long-term stability in a garden
- **Annuals:** Plants completing their life cycle in one growing season, providing vibrant blooms and requiring replanting each year for seasonal color and variety in gardens

- **Heirloom Seeds:** Seeds from plants that have been passed down through generations, maintaining their original characteristics, and often valued for their historical, cultural, or genetic significance
- **Raised Bed Gardening:** Cultivating plants in beds elevated above ground level, often enclosed by frames, allowing for better soil drainage, warmer temperatures, and easier accessibility
- **Compost:** Decomposed organic matter, such as kitchen scraps and yard waste, used as a nutrient-rich soil amendment to improve soil structure and fertility
- **Frost Date:** The average date of the last spring frost or the first fall frost in a specific location, crucial information for gardeners to determine appropriate planting times and protect sensitive plants
- **Microgreens:** Young, edible greens harvested at an early stage, typically within a couple of weeks of germination, prized for their intense flavors and nutritional content
- **Thinning:** The practice of selectively removing excess seedlings or fruits to allow the remaining ones to grow more robustly, ensuring proper spacing and resource allocation
- **pH Levels:** A measure of the acidity or alkalinity of the soil, influencing nutrient availability to plants. Adjusting pH levels can optimize conditions for specific crops

- **Fallow:** Allowing a field or garden bed to remain unplanted for a season to naturally restore fertility, control pests, or prevent soil erosion
- **Complexity Score:** The score assigned to a product based upon a calculation that takes in the feedback provided by users who have previously completed the product. This score can give a user a relative idea of how difficult a product may be to attempt.

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