**Project Name**

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#### **WHY**

#### **Problem Statement**

* Describe the problem you are solving.
  + Improving the bottleneck of determining what to plant based on the initial environmental conditions. Gardeners have spent dozens of hours researching to finally come up with a list of vegetables to plant, only to find out that they cannot plant half of them because it is not during the optimal season. This also includes pest-resistant plants that are an imperative companion plant for some vegetables, causing the number of feasible vegetables to plant to be less than half of everything purchased.
* Why is this a compelling and impactful problem to solve? Why is this a big opportunity?
  + A website/app that can suggest what to plant in a garden based on the number of sun hours, zone, time of year, the direction the garden is facing, and frost dates would help save time and money when planting a garden. Additionally, the learning curve for beginner gardeners is so high that many are too overwhelmed to start. This website/app would be able to simplify the learning curve so beginners can purchase, budget, and learn about the plants that they can plant right now. For more advanced gardeners, this would make budgeting more efficient as they can see what they can plant based on their initial preferences and can price compare before investing.
  + A future outlook for this project is to function like the [Kayak website](https://www.kayak.com/) but with consolidating gardening products into one website based on the user’s preferences. These preferences can be specific. For example, some users do not like to purchase from Amazon and prefer to purchase from a small business based on their location.
* What assumptions are you making about the problem / opportunity? (these assumptions would directly influence the key elements and features you would build in the minimal viable product (MVP)
  + All users will need to have a basic understanding of gardening terminology (i.e., compost, tilling, container, frost date, etc.)
  + All users will need to have basic to intermediate website/app navigation skills in order to use the website/app effectively.
  + All users will not need to know what planting zone they are located in (just need to know zipcode)
    - Using geolocation similar to this website by inputting zipcode https://planthardiness.ars.usda.gov/
  + All users will need to know what direction their garden is facing (i.e., north, south, east, west)
  + All users will need to have a general idea of what plants they would like to garden to help narrow down search

**Impact and market opportunity**

* How would you go about quantifying impact, market opportunity for this particular problem you are trying to solve by building a data science product?
  + We would need to do some research on how much our product is in need within the community. We do know that there is some need as there are already some products that do something similar. However, these other products don’t quite do the same thing as our product, or does the same thing but is completely broken or ineffective.
  + Unfortunately, we won’t know the exact quantification of impact unless we do a soft launch of some sort with the help of market outreach to gain traffic to the website/app.
* MarketSize (How big is this market, based on your research?)
  + According to Statista, the global gardening market value passed the 100 billion U.S. dollars mark in 2020, valued at approximately 104 billion U.S. dollars. Steady growth was predicted for the global market for garden equipment and supplies, with a sales value of nearly 130 billion U.S. dollars in 2024.

**Target Customer and user/customer discovery**

Who is the primary customer/user? What is the use case? What are key assumptions you are making about the primary customer/ user and use case?

* Identify targeted user/customer segment for the MVP.
  + Beginner to advanced gardeners that are within the planning stages of their garden.
* Define the primary use case validated by this target user/customer.
  + For example, a gardener that would like to start planting within the month of October will be given a list of plants that they can start planting within that same month. They will be given a list of vegetable suggestions, companion plants, or aesthetic plants based off the customer’s preferences and location.
* What might be other key assumptions that are important to validate with the target user/customer?
  + They would probably need to know a general idea of the amount of sun hours they get. Some people live within covered spaces, making the amount of sun hours drastically different.
* How would you go about validating these additional key assumptions.
  + In regards to the customer’s location, we can prompt the user if they know what zone they are in and what direction they are facing.
    - If not, we can use location based access prompts to help them figure it out.
  + In regards to the customer’s sun hours, we can prompt the user if they know the number of hours.
    - If not, we can ask if the garden they are planting in is a covered space, and based on what direction they are facing, we can estimate how many sun hours they are getting.
* Who will you contact to conduct initial user research and feedback?
  + https://www.appypie.com/market-research-app-idea-how-to
* What is the user journey and UI/UX for this data product?
  + https://www.resourcifi.com/blog/app-idea-research/

**Market Landscape / Competitive Landscape / Existing companies solving the same / similar problem**

Who are the major players and main vendors in the space? What are the existing solutions?

| **Company Name** | **Stage (startup, enterprise)** | **Product / Solution overview** | **Who is the primary customer?** | **Key differentiation vs your proposal (based on your understanding/**  **research)** |
| --- | --- | --- | --- | --- |
| Seed to Spoon | Startup | Mobile App | Gardeners | They have a very similar product to ours, however, it’s completely broken and doesn’t have the customization that we are trying to accomplish. Additionally, some of their information is incorrect and can cause a lot of damage to someone’s garden that doesn’t know any better |
| GardenPlanner | Startup | Mobile App | Gardeners | Their app can plan a garden based on environmental conditions and space but you still have to go through several iterations to figure out what you are able to plant right now. Our project puts priority on what the user is able to plant now, taking out the time to make several iterations. |
| Garden Manager | Startup | Mobile App | Gardeners | Their app only considers what to do with their garden from planting to harvesting, not the planning and budgeting stages before planting like our project focuses on. |
| Johnny’s Selected Seeds Planting Calendar | Startup | Website | Farmers/Gardeners | Their website only goes over when to plant your seeds indoors and transfer them outside based on what you already have. This helps with frost dates mostly but it focuses on what you already have to plant. Our project focuses on garden planing before purchasing any of it. |
| [Garden Time Planner by Burpee (appadvice.com)](https://appadvice.com/app/garden-time-planner/594225389) | Corporation | App | Farmers/Gardeners | Doesn’t take into consideration what direction you’re facing and doesn’t tell you how many sun hours you’re getting. |
|  |  |  |  |  |

If you can’t identify existing solutions or similar solutions that solve the problem, please explain why there isn’t an existing solution.

**Relevant readings, market research, white papers, academic research (share title and link)**

* [**Market Research for Your App Idea - AppyPie**](https://www.appypie.com/market-research-app-idea-how-to)
* [**How to do Market Research for An App Idea? | Resourcifi**](https://www.resourcifi.com/blog/app-idea-research/)
* [**Research 101: How to Conduct Market Research for Your App — Shopify App Development (2022)**](https://www.shopify.com/partners/blog/market-research-app)

**WHAT**

**Minimal Viable Product (MVP)**

* What is the minimal viable product that you are building that will specifically test the fundamental assumptions you have about the problem and the value of your solution?
  + What are the main features and why?
  + What is the value delivered to your user/customer?
    - Reduction of complexity in planning reducing overall time
  + What is the key question or questions (max 3) that your target user/customer will be able to answer using your Capstone product?
    - What can I plant right now?
    - What companion plantings can I do?
* What data science approach would you intend to use for the MVP? (this is NOT UI / UX but technical discussion)
  + Open problem…
* How would you potentially test the efficacy of the MVP? When would you start testing?
  + Testing with user, and having feasibility on our end
    - Compiles a list of plants they can garden now
    - Has companion plants

#### What is the key **differentiation** between your MVP and the existing solutions and/or approaches?

#### **Value Proposition** (what value/utility does your project/product provide to your intended users?)

* State the value that your MVP brings to the target customer segment.
  + Decrease research hours
  + Decrease garden planning hours
  + Increase encouragement to start a garden for beginner gardeners
  + Increase plant availability awareness to gardeners
  + Increase budgeting opportunity
* The value proposition should indicate why your solution is better and/or more differentiated.
  + Our product is a better solution than what’s on the market because it’s a more customizable experience without having the required knowledge to plan out a garden. Other products assume that their customer is already an intermediate to advanced gardener where the customer knows all of the conditions that apply to their garden. Our product is more inclusive to beginner gardeners that might not know all of the conditions that apply to their garden space.
  + Even for intermediate to advanced gardeners, our product takes out the extra steps they would have to take by only asking their zone and direction their garden space is facing. Our product will be able to find suggestions of what they could plant and even suggest different varieties that they didn’t know was an option for them.

#### **Mission Statement**

#### Utilizing existing data sets in the gardening domain, we plan to incorporate data science algorithms to make predictions for consumer reduction of effort to achieve a more successful agricultural outcome in botanicals for aesthetics, and culinary consumption.

#### **HOW**

#### **Data sets**

* What datasets do you intend to use?
  + [**USDA Plants Database**](https://plants.sc.egov.usda.gov/home)
  + [**THE BEST GARDENING DATABASES ON THE NET (wirefence.co.uk)**](https://www.wirefence.co.uk/the-best-gardening-databases/)
  + [**Plant databases and scientific resources for gardeners - Plants Map FAQ**](https://help.plantsmap.com/article/34-plant-databases-and-scientific-resources-for-gardeners)
  + [**garden data on data.world | 14 datasets available**](https://data.world/datasets/garden)
* Are the datasets public?
  + Yes, all data sets are public
* What are the datasets attributes / metadata that could make the exploratory data analysis easier / harder?
  + Need exploratory data results for this

#### **Project Management**

* What is the role of each member (who will do what specifically)?
  + We’re all in this together and will fill in the gaps as necessary
* Who is the project manager and chief facilitator (and tie breaker)
* Who is the resident SME?
* Who is the product manager?
* Who is the lead on infrastructure and data engineering?
* Who is the lead on EDA?
* Who is the lead on model evaluation?
* Who is the lead machine learning engineer?
* Who is the lead MVP application developer?
* Who are the backups to key roles?

|  | Role and responsibilities (immediate) | Role and responsibilities (long term) / Alternate or additional role / pair |
| --- | --- | --- |
| Team member 1 | Kasha Muzila | ML ideas and figure out what works |
| Team member 2 | Karl Eirich | Exploring dataset to see if they are feasible to use. |
| Team member 3 | Robert Turnage | UI/UX journey |
| Team member 4 | Cynthia Zhu | Target users |

\*\*Some teams have used pairing principles to assign two members of the team to main tasks.

* What are the strengths and weaknesses of each team member?

|  | Strengths | Weaknesses |
| --- | --- | --- |
| Team member 1 |  |  |
| Team member 2 |  |  |
| Team member 3 | SQL, WebScrape Data, Python, Math |  |
| Team member 4 | SQL, Python | UI, Deployment |

* Submit the Team Process Agreement.

#### **Technical Approach and Planning**

* What methodologies would you use for initial data exploratory analysis to ensure your datasets are sufficient and meaningful?
* What data science algorithms are you intending to develop and build for the project?   
  What challenges do you potentially foresee? Selecting a DS algorithm that will provide the right method to value idea.
* What help do you need?

Note: there is a weekly team check in at the beginning of each class starting week 4 and during non-presentation weeks. The team check-in is usually 3-5 min. Please cover: major milestone(s) achieved in the past week, major milestones to be achieved this week. One key learning to share with the class. And help needed.