Milestone 5: Crop Kingdom Revised Design Document

Project scope

Our team

- Lead game designer: Lonnie Kim
- Lead programmer: Haris Ayub
- Lead art designer: Amy Fan
- Lead quality assurance: Muzamil Janjua
- Lead level designer: Jin Sunwoo

Concept

Overview
- Genre: Simulation/Tycoon game, Strategy game, Tower defense game
- Target audience: People who enjoy simulation and farming games
- Platform: Support both mobile and PC

Theme and setting

The theme of Crop Kingdom is based on farming life, emphasizing defending crops from enemies such as pests and insects and severe weather conditions. The game encourages players to take on the role of a farmer, an engineer, and an entrepreneur and engage in various activities such as planting and harvesting crops, utilizing storage and farm space, and maximizing income. Our game is heavily inspired by other tower defense and farming games like Clash of Clans, Farmville, and Bloons Tower Defense.

The setting of Crop Kingdom is a rural farming village constantly threatened by severe weather conditions or various enemies, such as different types of insects and pests. The game world is set in the countryside, with fields of various crops and farm storage scattered throughout the village. The player's farm will be one of several in the area and increase in size as he grows and harvests more crops. There will also be a change in the environment by multiple weather patterns and seasons.

[Revised] Due to time constraints, weather patterns and seasonal features were not implemented in the game. We also decided to forgo adding more elements to fill up the store as we did not have the time to implement different defense mechanics. We were also unable to add in the supple and demand aspect.

Goal

The high-level goal of Crop Kingdom is to maximize income earned from the farm by making it prosperous while protecting it effectively from external threats. To achieve this goal, players must make strategic decisions about which crops to plant and when to grow them and invest in weapons to fend off attacks from enemies. Players can also choose to play in challenge mode, which will have a more accelerated speed of attacks and threats on their crops but will eventually result in substantial income gains if successfully defended.

In the end, the success of the player's farm will be measured by crop yields and the profit earned from them. As the game advances, the difficulty level of challenges will rise, making the players constantly adapt and refine their strategy to safeguard their farms from potential threats.

Player experience

In the Crop Kingdom, players will take on the roles of farmer, engineer, and entrepreneur, experiencing the challenging life of farming. As a farmer, players will feel satisfaction and accomplishment as they grow and harvest crops and feel thrilled and tense while defending their crops from enemies. As an engineer, players will feel a sense of ownership and pride as they strategically plan which crops to plant, when, and how to defend them effectively. Finally, as an entrepreneur, players will feel successful as they focus on maximizing income through harvesting crops. These different roles will combine to provide players with a fulfilling and satisfying gaming experience.

In essence, Crop Kingdom offers players an experience that revolves around feelings of ownership, pride, and the excitement of competition, as they construct and safeguard their farms from possible dangers and threats.

Relationship between non-mechanical elements and player experience

In Crop Kingdom, the non-mechanical game elements, such as the theme, art style, and narrative, are important in determining the overall player experience of the game.

The challenging environment of the farming theme in the Crop Kingdom lets players take on the roles of a farmer, an engineer, and an entrepreneur to protect their farm from threats and raise crops with maximum profit. In this process, players will feel a sense of pride and ownership of their progress and achievements in the game. Also, the setting of defending crops from enemies or severe weather will add tension and pressure to the game, creating a thrilling experience for players.

The art style of Crop Kingdom also contributes to the player experience by creating an inviting and relaxing atmosphere. Using a natural color palette and cute cartoon-like characters and environments will develop a sense of warmth and familiarity for players, making them feel at ease while playing the game.

The narrative of Crop Kingdom is closely related to the player experience since it establishes the context for the obstacles and opportunities the player will encounter throughout the game. The player takes on the role of a young man who has inherited a small patch of land from his family and must work hard to make a maximum profit which will make his family and the village rich. This narrative will create a sense of responsibility from the player and give them a purpose to play the game more effectively and successfully, as the success of the family and the village depends on him.

Overall, the non-mechanical game elements such as theme, art style, and narrative all work together to create a player experience that revolves around pride, satisfaction, ownership, and competition while providing a relaxing and inviting atmosphere that keeps players engaged and invested in their farm's success.

User Interface Design

User Interface

The UI will be very similar to those other idle games such as Hay Day, Clash of Clans, etc. User interface elements include: minimap of the entire farm, status of current resources (gold, crop seeds), menu for shop, inventory, defense challenges, current date/season. All the menu and status UIs will be on the edge of the screen to allow users to look at the middle of the screen for the majority of the gameplay. Additional UI will be present when the elements on the farm are touched, you can see the status of crops by clicking on the crop and similar for other buildings and defense technologies. Menus like inventory, shop, defense challenges will take you to a separate screen in order to have a much closer interaction with them. For inventory, a separate screen will be displayed to show all the crops you have collected. For a shop UI, ideally it'll have two separate menus for two different types

of shops: farm and defense shops. Ideally, the focus is more on the actual farm itself so the goal of UI implementation is to keep it as minimalistic as possible.

Camera Model

Camera model will be zoomed in isometric perspective during idle farming portion whereas the camera model will be a more zoomed out isometric perspective during defense challenges. During the idle farming part, we use isometric perspective with the option to zoom in and out so that a player can get a good view angle of the entire farm while being able to interact with elements within the farm. During defense challenges, the camera model is the same, but as default it is zoomed out more. This allows the user to see the entire view of the farm to spot any threats quickly. This idea was borrowed and revised from video game "Clash of Clans", as they keep the same isometric camera angle for both farming and attack portions.

Control Schemes

Control scheme includes just a touch control scheme using a mouse. In cases such as typing username/password, searching for items in shops, the keyboard will be used in this case but main interaction with the game will be done through mouse pointer touches.

Mechanical Design

Gameplay Loop

The core gameplay loop of Crop Kingdom is more in line with a traditional tycoon game rather than a tower defense game, in that the main focus will be on upgrading the farm through resource generation and not so much the traditional between waves set up of a tower defense. Main gameplay loop consists of strategically arranging your farm with crops and defenses, which in turn generates passive income as well as attracts a few enemies. If the player is not satisfied with the pace of the income they can challenge a wave of enemies which will accelerate in game time leading to massively increased income as well as special rewards and unlocks. After this the user can repeat the cycle with their newfound crops, defense units and cosmetics. We are hoping to give the user a rewarding, but also potentially risky sense of progression in giving players the ability to challenge earlier than they might be able to handle the enemies, but with the right strategy they may be able to come out on top.

Main Gameplay Actions

Main gameplay actions of this game includes planting, collecting, and selling crops, placing buildings and defenses, clicking minor threats away (ex. ants) and inventory management. Every action regarding the control of crops will be done on the main UI as you can click any empty area of the farm to see which crops are available to plant with the current advancement of the farm. Once you decide on what to plant, you spend a small price for the crop seeds and they will be planted on a small tile of land you chose, and you're able to view the progress of the crop as the time remaining until its ready to be collected is displayed. Once it's ready to be collected, players can click the crop tile and it will be stored in the inventory. Here is when the inventory management comes to play, for every advancement of the farm there will be limited space in the inventory. There will be a UI for inventory you can click to expand the screen to see the entire inventory of all the crops you have collected and have yet to be sold. Crop price changes every day in game time slightly so it's encouraged that users constantly check up on when the prices are high and decide to sell the crops away when they are at peak prices.

In terms of placing buildings and defenses, you can use the shop UI to take yourself to the shop and browse all available tech that can be placed in your farm. It should show its price, what it does, and the units of space required to place it (ex. 2 x 2). Once you have purchased a building, they will be placed in your inventory and you can click them to place it in an empty area of land in your farm. Note that any building purchases or placements are not permanent, you have the option to sell them back for the same price and to change the placements of the buildings whenever you want. This can be done by clicking the building placed on the farm and clicking the option of "Sell" or "Move".

Lastly, players are able to mitigate against minor attacks simply by tapping on them on the screen in a timely manner. Bug attacks occur fairly regularly and these can be prevented with bug defense units but these users also have the option to handle these much faster if you react to it and click them.

Challenges

Main challenge in this game is to make the best out of the money in possession to plan farm upgrades, plant crops that generate the greatest revenue at the time and to balance the budget spendings between farming technologies and defense technologies. Also, managing your limited inventory space and planning crops sales so you can sell away crops that are at its peak price. The ideal implementation for crop economics is that the price for every crop depends on the randomized supply and demand within the game that is dependent on the current season the game is in (ex. Watermelon has higher demand in the summer), how much of each crop has been sold lately, etc. Ideally, we want to show each crop's detailed price range and

its statistics so far to enable users to predict its price in the future with a graph visual. This will be a rewarding challenge for all players as the more they put their interest into these statistics they will get a higher reward. This will generate a challenging player experience for users making them think much more while playing the game and using their sense of economics.

While this game is more of a casual game concept, players can choose to partake in defense challenges to earn greater rewards to pace up their farm progression. There will be a menu UI you can click to take yourself to the defense challenges screen and users will be able to view all the available challenges. These will be sort of set up as stages, meaning in order to unlock more difficult challenges, certain advancement of the farm must be made and the previous challenge must be completed. These challenges will basically be very harsh attacks towards the farm that a player will have to defend against with their defense technologies. Examples of these attacks could be giant swarms of grasshopper attacks, natural disasters such as tornadoes, drought, extreme climate changes, farm invaders/thieves, etc. Once a user decides to partake in a challenge a timer will show up indicating the time remaining and waves of attacks will come in. Some of these attacks will be mitigatable by clicking on them but most of these attacks will be dependent on the defense setup which is done before attempting any defense challenges. While the challenge is in progress, the crop production is accelerated by a significant amount, allowing users to collect a lot more crops in a short amount of time. However, this will mean that users will also have to take into account the limited inventory space, as these crops that are collected will have to be sold to the market very fast in order to take advantage of the accelerated production rate.

To summarize, these stages of defense challenges will allow users to test their game ability in defense-game skills and fast decision making skills. As much as these challenges boost the growth of your farm it can lead to loss if you fail to complete them successfully. This "high risk high reward" gameplay will allow more hard-core players to challenge themselves and to enable users to come up with optimal defense plans for each stage.

Gameplay Modes

The game is not technically split into any "game modes", however there are two main parts of the game a player can put more focus into, which is: player can focus more on farming tycoon game portion, where the emphasis is more on upgrading, decorating, and expanding the farm so it's more aesthetically pleasing and it produces large revenue. This part will depend on many customization factors that will be implemented in game such as, different trees, plants, pattern blocks that users can purchase to place on the farm.

On the other hand, a player who is more interested in the difficult defense challenges can participate more on the tower defense game portion: completing these challenges to earn rewards and to prove their skills rather than decorating the farm. These defense challenges were explained in the earlier sections. Finally, with these two parts of the game being in place, it suggests two different types of playstyle a user can choose to pursue in Crop Kingdom.

Systems in the Game

Some mechanics in Crop Kingdom are borrowed heavily from other idle farming games, but our hope in this design is to get rid of the long wait times that are usually only skippable via microtransactions, and allow the player to accelerate at their own pace. The game also includes some technical skill expressions in the way of helping towers with your farmer, although this is not necessary if the user waits for their upgrades without triggering the acceleration. Finally, the game has seasons for certain crops, and we intend to add multiple different farming environments so the player can have different experiences with different crops.

<u>Non-mechanical Design</u>

Narrative and other elements

The narrative of Crop Kingdom is set in a small rural village that relies on its crops for survival. The player takes on the role of a young man who has inherited a small patch of land from his family. The village has struggled to make ends meet due to bad weather, pests, and bugs. The player must work as a farmer, an engineer, and an entrepreneur to ensure his crops thrive and bring in a good harvest for his family and the village.

For character designs, the farmer and various types of enemies, such as pests and insects, will be created in the prototype. As we continue to develop the game, we will update these enemy designs with additional details. While we won't build a narrative NPC for the prototype, we may include one in the final version.

The key moments in the Crop Kingdom will be when players encounter enemies attacking their crops or facing severe weather conditions threatening their harvests. Given the wide range of enemies and weather patterns that we'll be introducing, it will be essential for players to devise effective strategies and utilize appropriate tools to protect their crops and maximize harvest yields.

Visual Aesthetics

For the visual aesthetics of Crop Kingdom, we will use a natural color palette to depict the landscapes and environments. We believe that bright and natural tones will create an inviting and relaxed experience for our players. Additionally, we will use a hand drawn art style that makes the enemies feel childish and less real, adding a little bit of humor and charm to the game while keeping the game casual and fun. However, due to time constraints and resource limitations, we also incorporated some readily available assets that didn't quite match our desired aesthetic. We made this decision to complete the game without having to create everything from scratch.

For Crop Kingdom, the game components that require visual components include the farmer, enemies such as bugs and pests, crops, farm storage, stores, items, and landscapes.

Listed below are the game components that require visual components along with links to their respective assets:

- Landscapes, trees, plant, Farmer and crops
  https://assetstore.unity.com/packages/3d/environments/landscapes/low-poly-simple-nature-pack-162153

- Weapons
  https://assetstore.unity.com/packages/3d/props/weapons/sci-fi-turrets-cannon-69615

- Bugs and pests
  Drawn by Muzamil

Audio assets

To create a more immersive player experience in Crop Kingdom, various audio assets will be used. Calming background music will create a relaxing atmosphere on

the farm, while sound effects of enemies attacking crops will add a sense of tension for players.

Listed below are the audio assets we have used or plan to use for Crop Kingdom, along with their asset links:

- **Background music**
- For now, a Pokemon city theme is the background music but we hope to have our own music created for the final game.
  https://www.youtube.com/watch?v=im6tbN9SZXs

- **Sound effects**
  For now, all actions will use sound effects from Clash of Clans, all of which can be downloaded here:
  https://www.mediafire.com/folder/upze7oz06paiw/8JSimo_-_CoC_Sound_Effects. We also hope to design and record our own sounds for the final product.

  [revised]
  edited sound bites of these were added to make the game feel more responsive
  https://freesound.org/people/scorepion/sounds/424917/
  https://freesound.org/people/vox_artist/sounds/512166/
  https://freesound.org/people/HonorHunter/sounds/271666/

Level Design

Crop Kingdom is a game that features a single stage with a unique level design that emphasizes increasing difficulty as the player progresses through the game. The game is set in a farming kingdom, where the player takes on the role of a farmer tasked with protecting their crops from various pests and enemies.

The game starts with an open field, where the player must plant their crops and start their farm. As the player progresses, the enemies become more frequent and more challenging to defeat. The level design is specifically designed to reflect this increasing difficulty.

Stage 1: Tutorial
This level will introduce players to the game mechanics, actions, and challenges. The ants will come slowly and can be easily defeated with a single tap. This will give a good sense of the controls and the game's basic premise.

Stage 2:
At this point, the pests will become more aggressive, making it too difficult for the player to click on them by hand. This stage will introduce the player to tower defense mechanics, where turrets and defense towers will be necessary to build. The farm progression rate will slow down as money has to be spent on building these defenses.

Additionally, there will be five different challenge levels that the player can access at any time. Each level has a bigger multiplier, increasing crop growth rates.

Time constraints and scoping issues prevented the development of a proper end game and additional stages. As a result, players may find themselves finishing the game and becoming bored without proper goals and challenges to continue playing. With a longer development cycle, we would have added more stages that offer bigger jumps in progression and unique challenges, forcing players to rethink their playstyle and providing a more satisfying experience.