MU AND THE LITTLE REEF DESIGN DOCUMENT

Mu and Friends
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(Technical Designer)

Content

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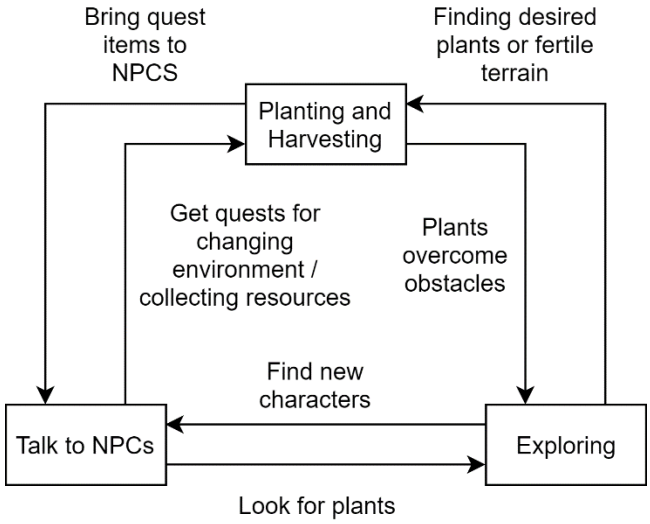
Overview

Pitch

Mu and the Little Reef is a 3rd-person adventure sandbox game about cultivating underwater plants to explore and breathe life back into a sterile underwater city.

Players explore an empty reef, using their supernatural abilities to grow plants rapidly. These plants help fishy citizens move into the reef, either by giving them vegetation they're looking for, or producing items the NPCs can use.

Core Gameplay



For these gameplay loop diagrams, arrows indicate the most common flow between these activities. Text here explains why players would move from one task to another.

Players move and plant flora that grows rapidly. Some plants allow them to overcome or remove environmental obstacles, like a large, leafy plant that can be climbed to scale a dropoff, or a pungent one that removes fish who are blocking your way.

Exploring the environment by swimming and platforming on plants gives the player access to new areas with NPCs. These characters need your help with either growing plants in certain areas, or bringing them resources you can acquire from farming.

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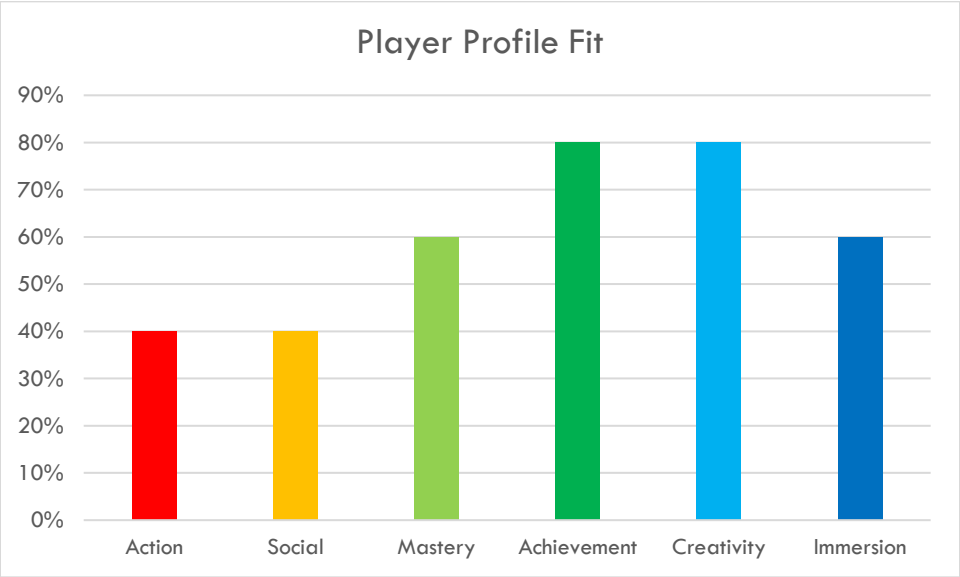
Audience

Mu's target audience is players in their early teens and later looking for a game that gives them great control in shaping a beautiful, lush world in a way that satisfies its diverse cast of inhabitants. The game does have a number of other systems and mechanics that will make it enjoyable for a variety of players branching out of this core set of motivations:



1. Revitalizing the city and creating unique solutions to problems with emergent systems will appeal primarily to creativity.
2. Achievement is fulfilled with covering the map in plants, helping as many NPCs as possible, and completing the herbarium.
3. Doing these efficiently with hybrids and roaming farmland appeals to mastery.
4. The diverse characters and world will appeal to immersion.
5. Some activities, such as rapidly growing and traversing large plants, or riding the giant underwater creatures to different areas, will have minor appeal to action.
6. Unlockables, such as plant dyes, character customization options, and unique events they can trigger in the world, create a more personalized experience that's worth sharing via screenshots, videos, or streaming. If we were to add multiplayer, cooperating with friends to customize and explore a world together would also draw in players looking for a social experience.

Platform

The game is being built in Unreal Engine 4 for PC (though a gamepad is required for play). We're targeting 15 minutes of play-time.

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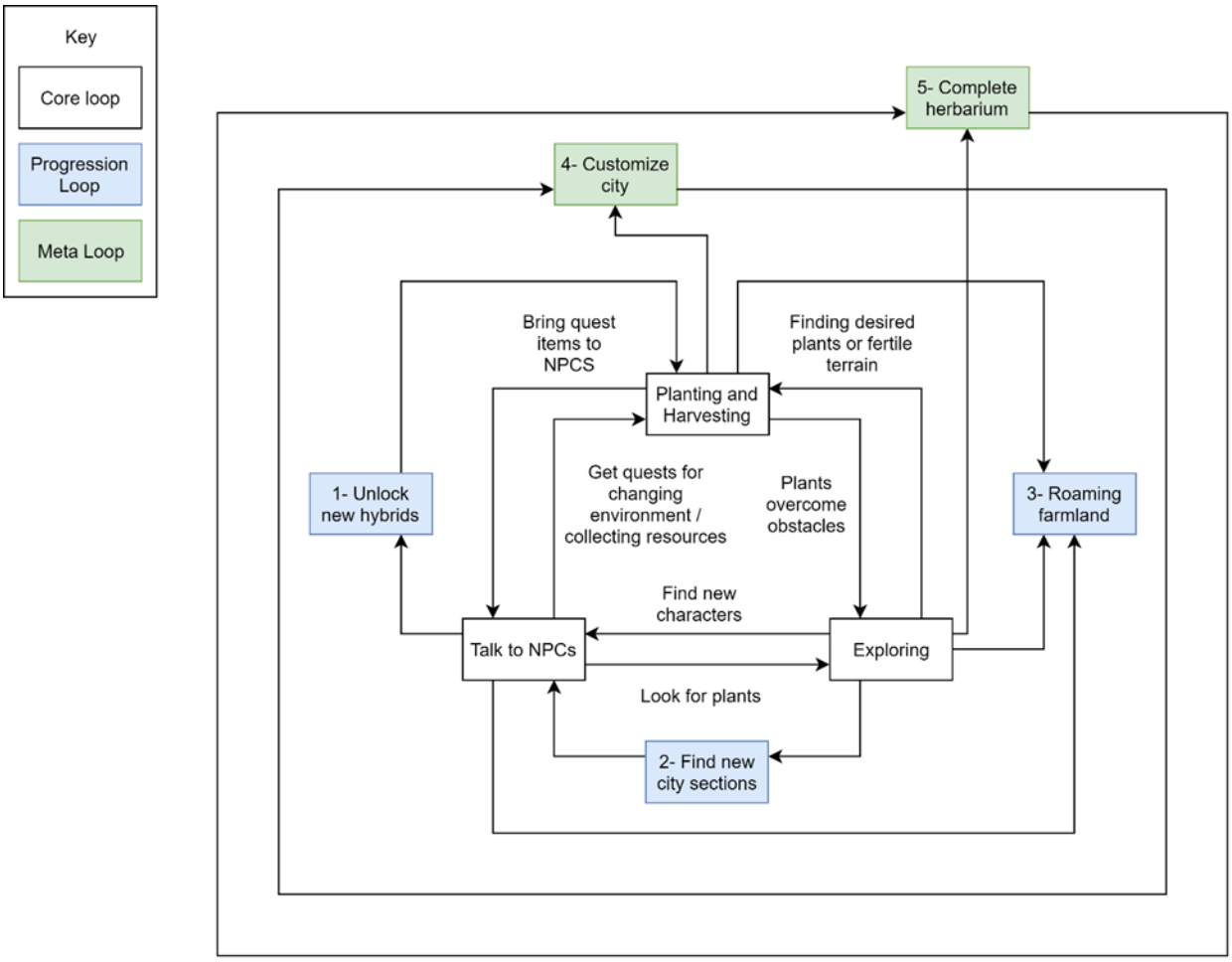
Progression

Game Loops



The game has 3 different points of progression, and 2 meta loops. These are ordered in terms of frequency / time to completion.

The first major step of progress the player will make is creating hybrid plants. By doing quests for NPCs and exploring, the player can gain sand dollars. The player will take two plants to a special NPC who will combine them for a small fee of some sand dollars. This will allow the player to combine the traits and/or yield of two different plants to increase efficiency at completing quests which require resource gathering. Some hybrids may also be necessary for completing the main quest, such as combining a large plant with a pungent one to scale an area and clear out fish blocking the path.

The second main point of progress will be unlocking new areas. The city is broken into 4 major sections that can be accessed by completing the main quest. Each section of the city holds unique plants, characters, and has a unique theme, such as one section being deep underwater with anglerfish NPCs and plants used for lighting the streets.

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Finally, the player can use large sea creatures such as sea turtles and whales as roaming farmland to further increase efficiency or navigate to different parts of the world quickly. These are the game's greatest reward, and could therefore require them to reach areas that are difficult to access, or complete quests that require a lot of planting or harvesting. Hybridizing and using plants from different reaches of the world would be necessary in either case.

As for meta loops, as a singleplayer game focused on expression and discovery, the player will gradually transform the city into a beautiful, living ecosystem. Plants could have different aesthetics and colors to allow the player more meaningful customization options separate from the plants' mechanical uses. The player will also have an herbarium with a list of every plant and combination they've currently found, and empty slots for the ones they haven't yet planted.

Gameplay Progression Model

Mu's Garden Average Player Progression

Milestone	Cumulative hours	Total crops planted	Hybrids found	Map % fully planted	Areas Explored	Large creatures unlocked
5 minutes	0.08	8	1	5%	2	0
15 minutes	0.25	25	3	16%	4	0
30 minutes	0.5	50	6	31%	4	0
1 hour	1	100	13	63%	4	1
1 day	3	300	38	100%	4	3
1 week	15	1500	100	100%	4	3
1 month	60	6000	100	100%	4	3
1 year	720	72000	100	100%	4	3

Mu's Garden Top Player Progression

Milestone	Cumulative hours	Total crops planted	Hybrids found	Map % fully planted	Areas Explored	Large creatures unlocked
5 minutes	0.08	8	1	5%	2	0
15 minutes	0.25	25	3	16%	4	0
30 minutes	0.5	50	6	31%	4	0
1 hour	1	100	13	63%	4	1
1 day	9	900	100	100%	4	3
1 week	63	6300	100	100%	4	3
1 month	252	25200	100	100%	4	3
1 year	3024	302400	100	100%	4	3

These values are based on players planting at a consistent rate, thus also finding hybrids and filling the map at a linear rate.

As per the project requirements, the game concludes after 15 minutes of play, at which point we would like players to see significant progress in their effort of re-growing the reef. At 15 minutes, players have planted around 25 plants, found 3 hybrids, and covered around 16% of the map with plants. If we assumed there were 15 plants that could all be hybridized, players would find the limit (roughly 100 different combinations) around 8 hours of play. Players can fill the majority of the plantable space after around an hour and a half of play.

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Endgame

Within the scope of this project class, the endgame will be focused on exploring each section of the city and satisfying the end goal: filling a certain portion of the city with new growth. At this point, mastery and achievement focused players may also be delving deeper into hybrids and roaming farmland to minimize the time it takes to complete resource-heavy side quests.

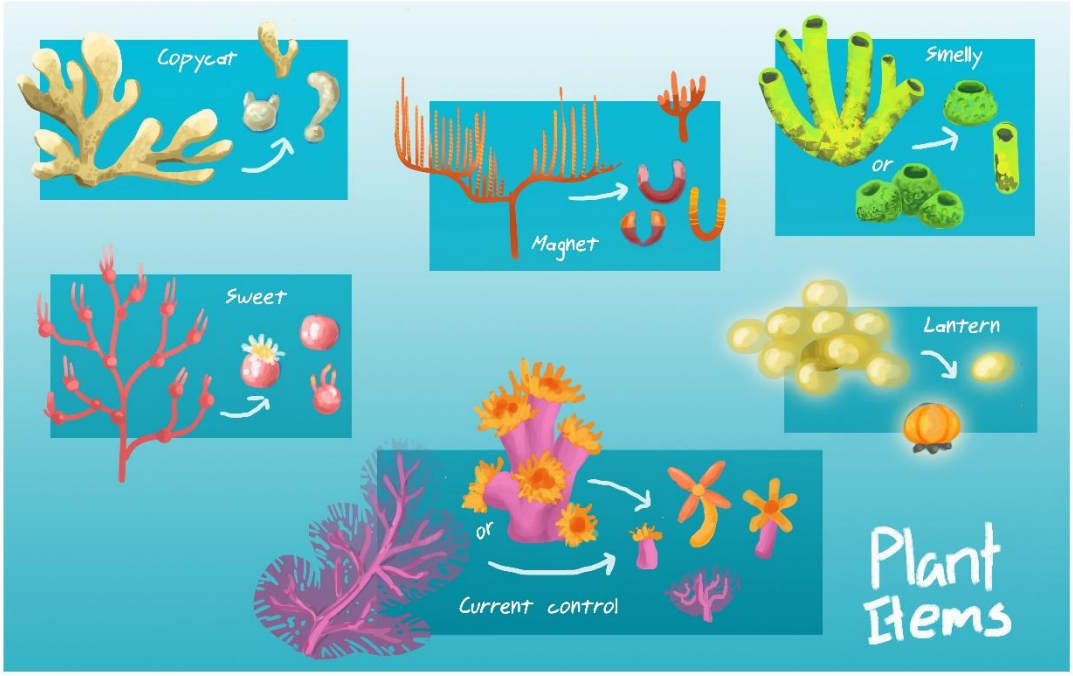
There may not be much reason to restart the game and play differently, since the player is free to destroy and re-plant to shape their world at any time, and how they approach quests won't explicitly change the story; there's no real branching narrative. The player may start over to experience the quests again, or to get a clean start if they plant a lot and want to give the world a different aesthetic without tearing everything in their current save down first.

Changing Meta

This project class won't allow for continuous updates or new content post-release, but the game could support this. Because of its systemic nature, new goals could be created in the form of rotating side quests or new NPCs that demand the player to form new planting strategies or explore hard-to-reach areas. These quests need to have some reward outside the progression loop we've already defined.

Meta items can include:

- Dye to grow different colored plants
- Cosmetic items for the player and their crab companions
- Decorations for the Mu's home
- Items that cause special interactions with NPCs, like bringing them into a group to dance
- Poses and animations for Mu



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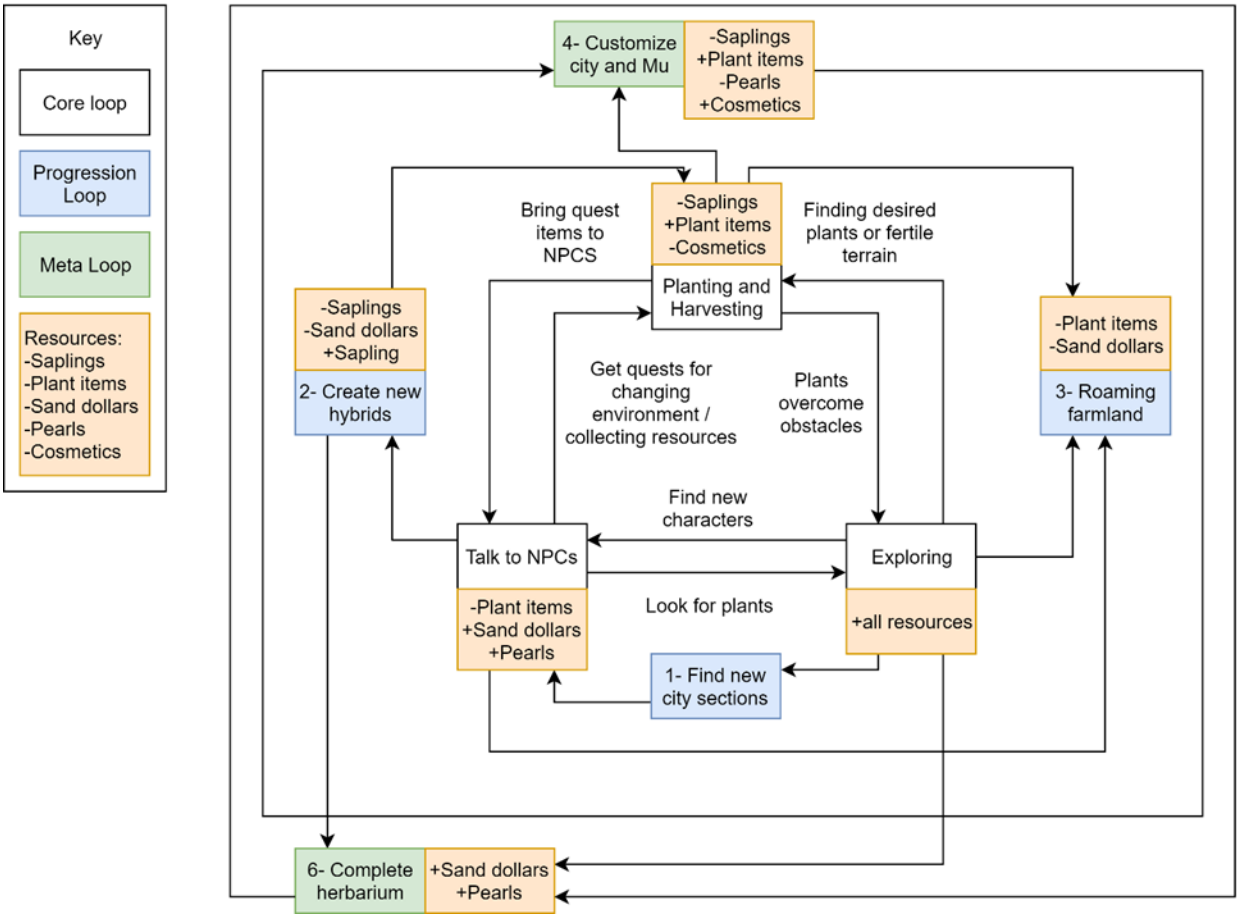
Economy

Resources

- Saplings: small versions of plants that can be found by exploring and/or unlocked by completing quests. A basic renewable resource that allows the player to get everything else.
- Plant items: these come from giving plants and can be given to quest givers to complete their quests or consumed by the player to get a temporary stat boost. Another renewable resource that players can use more directly to get sand dollars and pearls.
- Sand dollars: used for hybridizing plants and unlocking large creatures. A renewable resource that allows the player to increase their efficiency.
- Pearls: used for purchasing meta items, such as cosmetics for Mu and plant dyes.
- Cosmetics: dyes that can be used on saplings or Mu's clothes to change their color.

Acquisition and Exchange



Exploring and helping NPCs is how players will get more saplings, planting them will provide them with plant items.

Trading plant items to quest givers will yield sand dollars and pearls, both of which may also be found in small quantities by exploring the world's nooks and crannies. They will respawn in small quantities to ensure there's an endless supply. Plant items **may** be consumed by the player at any time to change their stats.

Sand dollars will allow players to create hybrids and unlock roaming farmland.

Pearls could be traded to certain NPCs for cosmetic items. Our team likely won't have the bandwidth to make cosmetics, but this could be a use for them.

Economic Progression Model

Mu's Garden Average Player Economy

Milestone	Cumulative hours	Sand dollars owned	Sand dollars used	Current sand dollars	Plant items used
5 minutes	0.08	28	14	14	16
15 minutes	0.25	50	25	25	50
30 minutes	0.5	71	35	36	100
1 hour	1	100	50	50	200
1 day	3	173	87	86	600
1 week	15	387	194	193	3000
1 month	60	775	387	388	12000
1 year	720	2683	1342	1341	144000

Milestone	Cumulative hours	Pearls owned	Pearls Used	Current Pearls	Cosmetics owned
5 minutes	0.08	7	4	3	0
15 minutes	0.25	13	8	5	1
30 minutes	0.5	18	11	7	2
1 hour	1	25	15	10	4
1 day	3	43	26	17	12
1 week	15	97	58	39	60
1 month	60	194	116	78	240
1 year	720	671	402	269	2880

Mu's Garden Top Player Economy

Milestone	Cumulative hours	Sand dollars owned	Sand dollars used	Current sand dollars	Plant items used
5 minutes	0.08	28	14	14	16
15 minutes	0.25	50	25	25	50
30 minutes	0.5	71	35	36	100
1 hour	1	100	50	50	200
1 day	9	300	150	150	1800
1 week	63	794	397	397	12600
1 month	252	1587	794	793	50400
1 year	3024	5499	2750	2749	604800

Milestone	Cumulative hours	Pearls owned	Pearls Used	Current Pearls	Cosmetics owned
5 minutes	0.08	7	4	3	0
15 minutes	0.25	13	8	5	1
30 minutes	0.5	18	11	7	2
1 hour	1	25	15	10	4
1 day	9	75	45	30	36
1 week	63	198	119	79	252
1 month	252	397	238	159	1008
1 year	3024	1375	825	550	12096

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Saplings are based on the calculations average saplings planted in the progression table.

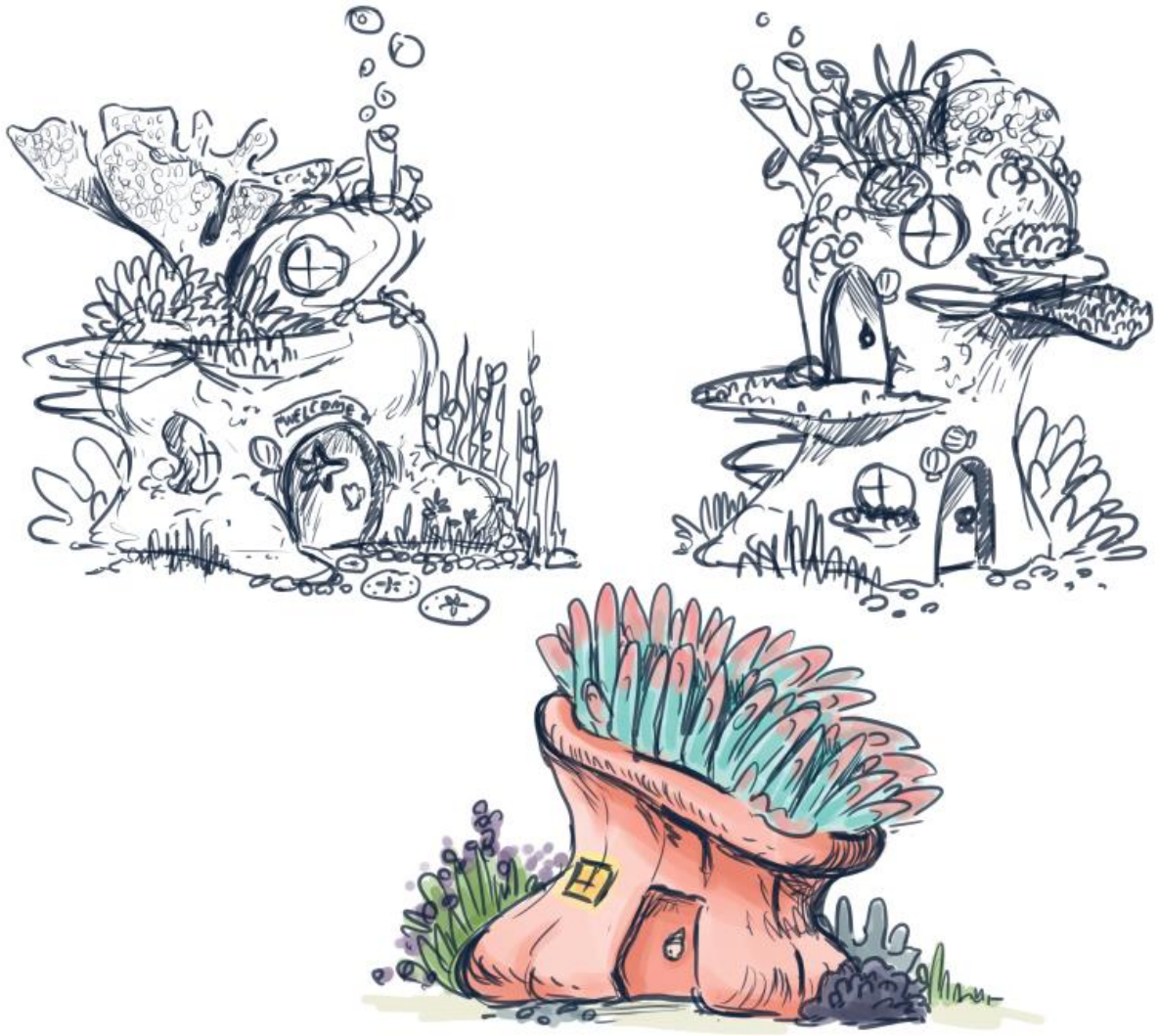
Sand dollars and pearls are earned and spent at a rate that begins quickly, then decreases as players exhaust the resources they can find, side quests to complete, and items to buy.

Inflation Risks

As the game's economy would have no impact on any multiplayer, there aren't any serious risks with the player having a lot of sand dollars or pearls.

Because saplings and plant items are physical, there may be an issue with too many of them being created, filling up the space, and potentially slowing down the game's performance. Plant items could de-spawn after a while if they're harvested without being used, and saplings that have grown into full plants can be destroyed to make room for new ones.

Some NPCs will have side quests requiring many plant items or saplings to be planted, which could help whittle down a player's surplus. Large creatures especially will take many resources to unlock.



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Social

Social Interactions

Save sharing:

- Players have their own saved games and can invite up to 3 players to each of their saves at once.
- Shared saves can be played on individually by any of the players allowed on them, so, even if the person who made the save originally stops playing the game, the other players can continue their progress through the game's quests on that save.
- Players will be playing at the same time and have a close personal connection to have actively communicated to get on the same save.
- Players make individual progress at their own rate, leaving and returning to the game when it's convenient to them while retaining their place in the story.

Finding games online

- Players can leave their save open for other players to join them, or join other players who have done the same.
- Loose-tie relationships form between random players who may easily part ways after playing, with the potential for those ties to become stronger after cooperating to complete the game's quests.

Cooperative quests

- Players plant and harvest in ways that allow them to all to reap the rewards of completing quests.
- Special quest givers will require all players currently on the save to contribute a certain number of resources to proceed through the game.
- Given that quest rewards give players more fun items to play with that are otherwise restricted, they should be compelled to work together to make that progress.

Sharing

- Fertilizer is a minor resource that players can use to grow their plants faster
- This fertilizer could be requested and transferred between players to give them more chances to help one another.
- Players can see friends' herbariums, and request to know where to find or how to hybridize plants.
- The other player would then be given the option to ping a spot on the in-game map, pick 2 plants from their herbarium that they think they hybridized to get the requested plant, or do nothing.
- Gives players a structured way to ask for and receive help, and having to do some input to give that assistance would give them some more agency and ownership over their good deed.

Communication

- Players can ping areas or NPCs with a short, pre-constructed phrase, or a specific plant or item to cooperate in a safe, non-toxic environment online.

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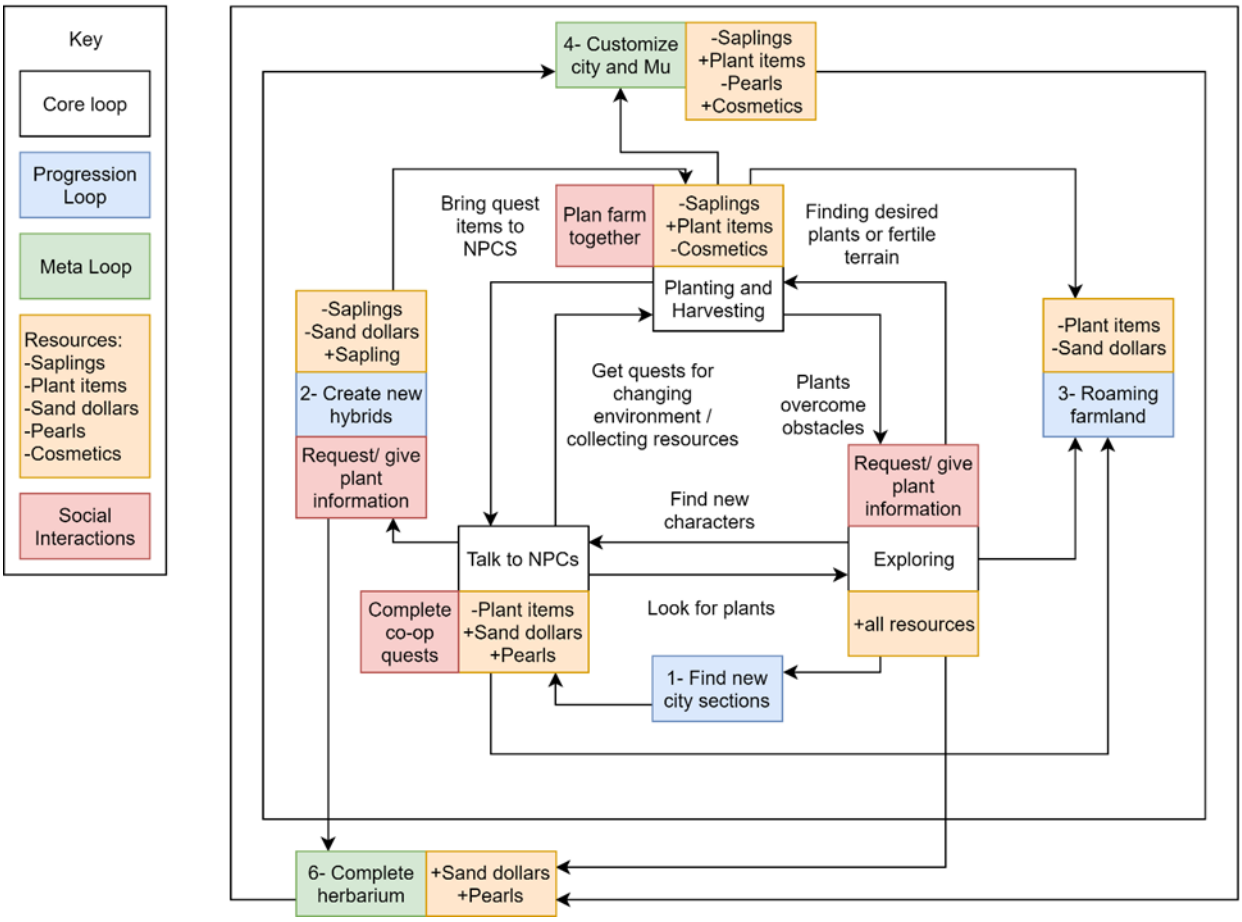
Social Game Loops



Social Mechanics

Players in private saves will likely have symmetrical, close ties with the other players. Players in public saves are more likely to have symmetrical loose ties. There is some amount of asymmetry due to one player "owning" the save and potentially putting hours of progress in before another player joins and potentially starts making drastic changes in a short period of time, especially since destroying plants for fertilizer is free.

Ideally the mechanics of giving fertilizer, working cooperatively on quests, and exchanging knowledge about how to find and hybridize plants would help players grow stronger ties over the course of playing. Coming back to a save that other players have worked on and helped one progress in may also strengthen those ties, since everyone can benefit from that advancement in the game's progression.

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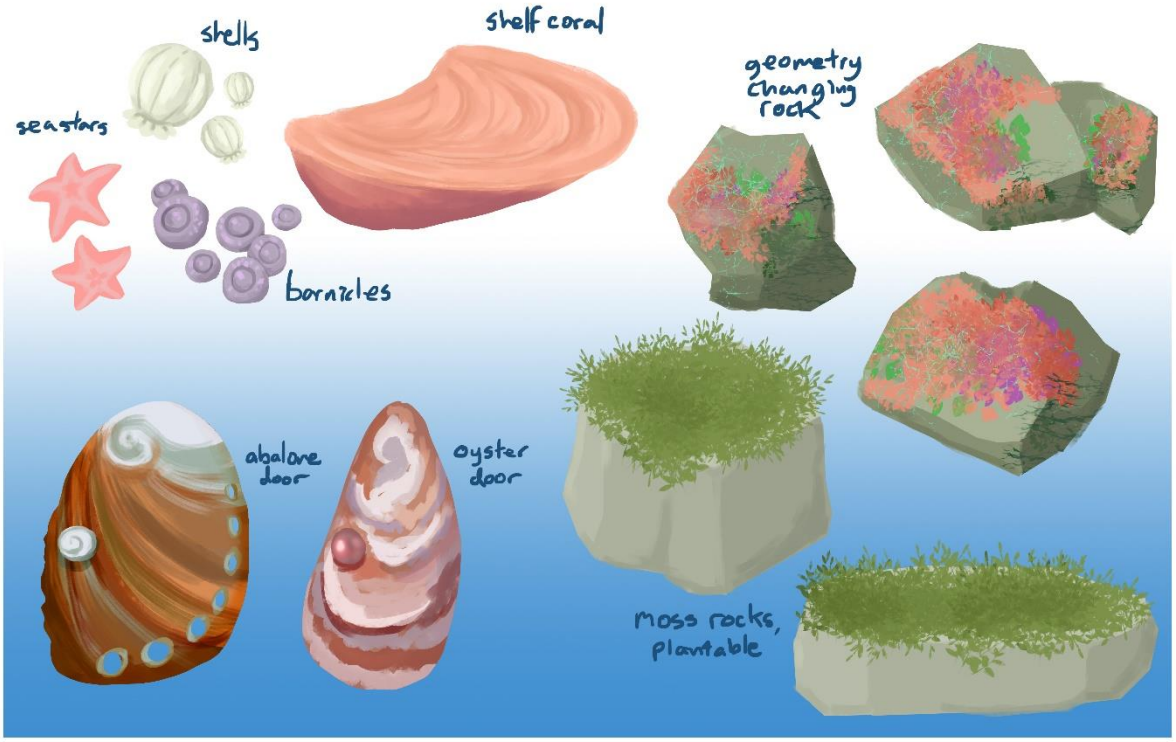
Toxic Behavior and Mitigations

Without restricting players from interacting with plants and items other players have made, which would be annoying in private save-games and confusing in public saves, there are a number of ways players could grief each other. Taking all the plant items and getting rid of them or giving them to a character whose quest isn't something other players want to tackle yet, destroying plants, or planting saplings in a way that is intentionally inefficient. For both private and public saves, there could be a system for reverting the save to the way it was before a particular player entered, and kicking a player from your save.

There should also be a system for flagging a player for griefing in-game. Players would be prompted to flag the other for griefing if they kick them from a save. Players who are flagged may be temporarily or permanently banned from joining public saves.



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Studio Costs

Team Size and Roles

Mu and Friends has 15 game developers:

- Design:
  - Stephen Kolodychuk- producer, system designer
  - Felix Knight- creative director, technical designer
  - Jarrod Ehlert- design lead, level designer
  - Justice Mealer- narrative designer
- Audio:
  - Ryan Bannister- audio designer
  - Megan Works- audio programmer
- Art:
  - Brittany Hathcoat- art lead, concept artist
  - Maggie Brown- VFX artist
  - Sabrina Martinez- animator
  - Dixie Aoki- environment artist
  - Sam Beeman- rigger
- Tech:
  - Josh Ibraim- graphics programmer
  - Abhishek Mohan- tech director, AI programmer
  - Craig Williams- build master, UI programmer
  - Jack O'Brien- gameplay programmer

Project Schedule

The project is split into 3 equal phases of pre-production, production, and post-production, each 14 weeks. Not all teams go on to post-production and no details have been given about its milestones, so it's not included in further estimates.

Cumulative weeks	Milestone	Description
3	M1 (3 weeks)	Team is formed and has 3 game concepts
5	M2 (2 weeks)	Rapid prototyping on 1 concept
9	M3 (4 weeks)	Core mechanics prototyped
14	M4 (5 weeks)	All game elements are prototype
19	M5 (5 weeks)	Feature complete
23	M6 (4 weeks)	2nd pass on features
28	M7 (5 weeks)	Ship, likely submit to student gallery

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Studio Budget

15 developers * $10,000 * 7 months = $1,050,000

If we multiply this value by 10/40 to represent the amount of time each member is expected to work weekly compared to a full-time employee, the rate is now $262,500

Target Revenue

Using ($262,500 * 5) / game price, these are the number of copies necessary to sell at a variety of price points.

Game prices	$1.00	$3.00	$5.00	$8.00	$10.00	$12.00
Copies necessary for 5:1 return	1,312,500	437,500	262,500	164,063	131,250	109,375

While I think it may be difficult to sell a 15-minute experience for more than $1, It seems like the sweet spot for revenue would lie somewhere between that and $3, since higher price also means fewer copies must be sold.

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Monetization

Monetization Strategies

Mu and the Little Reef will make revenue through 5 separate methods:

1. Retail cost of the base game.

Purchasing the game for a small cost gives the player some drive to at least try it, as letting it sit in their library would have a perceived cost of that price.

2. DLC that introduces new zones, NPCs, and plants

DLC gives players more environment to explore, characters to meet and help, and plants to experiment with. These plants can be hybridized with the ones from the base game, as well, unlocking much more content through combination. New denizens could also arrive in zones from the base game requiring the player to interact with the new content, encouraging players to return and mix the content from all areas, giving new context to older areas and plants.

3. Purchasing keys for sunken chests that can be found / earned. These chests will contain:
    a. Premium cosmetic items for Mu and his crab companions (separate from what can be obtained with pearls)
    b. Premium reusable dyes for plants and cosmetic items (also separate from pearls)

Premium cosmetic items will give the player greater expression and customization, not just over their character, but also the game world they are re-growing.

4. Merchandise featuring the game's characters, and discounts that can be earned by completing in-game tasks

Being able to purchase merchandise, especially ones that represent their personal progress in the game, will give players a greater sense of connection to the game's universe and opportunities to share their love for the title with others in day-to-day life. Seeing the merchandise online with a notice that it can be purchased for a discount may give players a greater incentive to pick up the game if they haven't already but like the merch, and give players who already have the game more goals to set for themselves. For instance, if they like a shirt with a certain character they haven't yet encountered, it may incentivize going to find and help that character for the discount code.

5. In-game advertising for real companies, along with non-profits dedicated to oceanic ecological restoration

Connecting the game to real-world issues and giving the player some information about how to make a difference may make the gameplay itself feel more significant, and players who do contribute to those issues may feel better about themselves, and gratuitous toward the game for inspiring them to help. If these philanthropic advertisements are included, it would help give some context for advertising real-world goods and services that can be monetized.

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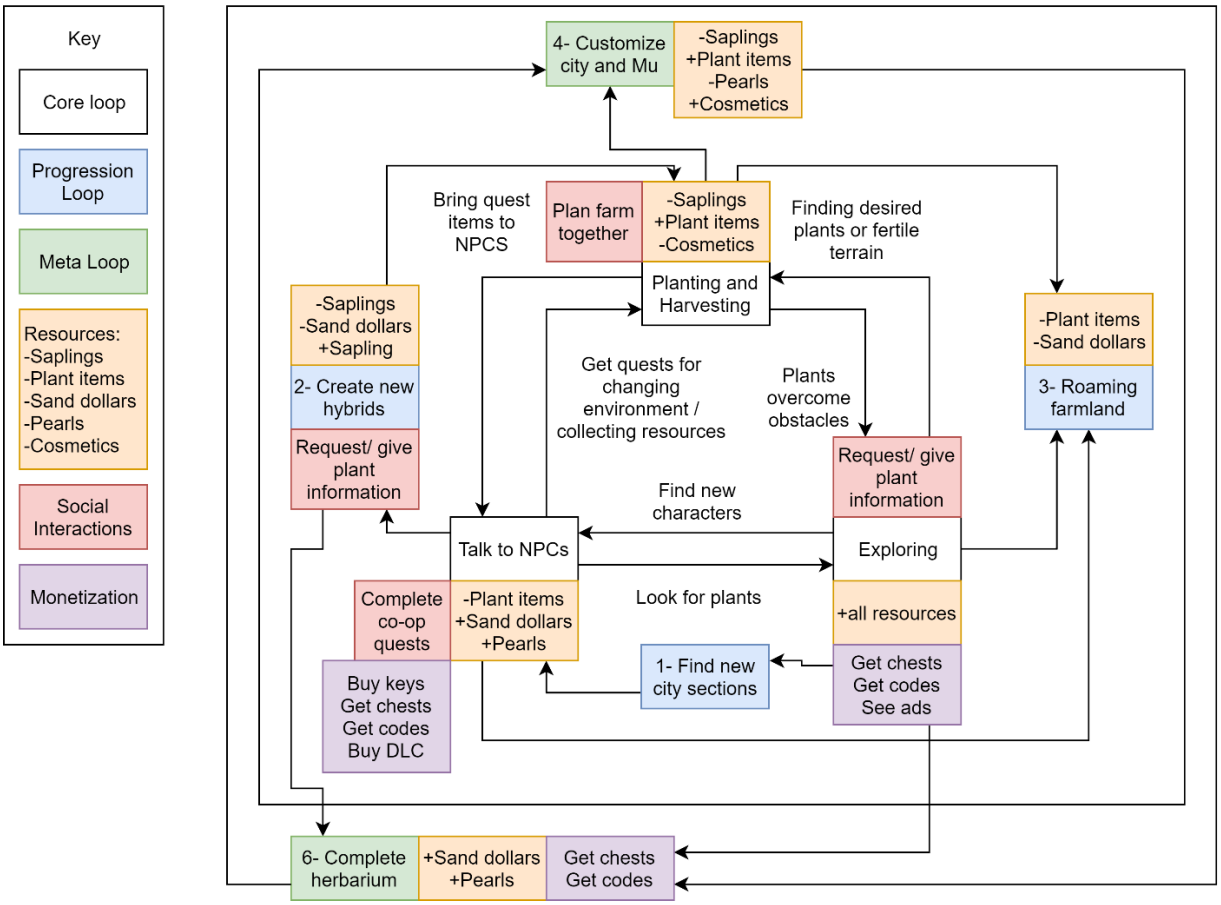
Monetized Game Loops



Players could talk to specific NPCs to open a window to purchase DLC content, like a gatekeeper that brings them to the purchase page. Buttons linking to the DLC purchases could also be shown on the main menu or a sub-menu in case players don't interact with that NPC. The DLC could also just be purchased through whatever service is selling it.

Players could find sunken chests and get discount codes for merch through 3 avenues: helping or finding certain NPCs, exploring the world and finding hidden areas, and completing the herbarium. Ideally the merchandise discounted would reflect their discovery or accomplishment; completing the herbarium, for instance, could give them a discount for clothing with a design primarily featuring plants.

There would be a fish NPC that could sell the player keys for their sunken chests. Upon earning or finding their first chest, the player would be shown the menu where they can view all the chests they've collected (since the game doesn't have an inventory and these wouldn't be stored physically like saplings and items). In this menu, the player could "peek through the keyhole" of the chest, seeing the item inside. Ideally, cosmetics would have a "set" of other items they look good alongside, so the player would be incentivized to go find the other chests containing those items and buy keys to unlock them all. This menu could also tell them where to find a key-seller NPC if they haven't already.

Players have a significant incentive to explore the world, which would cause them to come across in-game advertisements in the way of billboards and shop signs. Philanthropic ads could give players brief information about where to go to start creating real-world change.

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Monetization Risks

With discount codes, the discounted price must still be high enough to create a fair amount of price, but if the regular price is significantly higher than it, it may frustrate some people who can't play the game to get the codes, or who can't figure out how to find / earn the code in-game. These price points will just need to strike a balance between feeling rewarding when the player earns a discount, without making the merchandise feel too over-priced to buy without a discount.

Another issue with codes is that some players may give them out to other players if they don't want the merchandise themselves, and there will be a lot of codes that go unused regardless, as not everyone is going to purchase every piece of merch offered. These codes could therefore be tied to the player's account on whatever platform they're playing on to make them harder to transfer.

Players may feel frustrated having to purchase keys for chests that they already had to put some effort into finding or earning in the first place. This could be mitigated by making most chests relatively easy to get so that the value of one, individual chest doesn't feel so significant, putting the value more on the item within.

Players may be frustrated if there are too many advertisements cluttering the game world, so they should be kept to a relative minimum; playtesting feedback should determine where they're noticeable without becoming obtrusive. Having advertisements for good causes should ease some of the negative feeling toward in-game advertisement, as well.

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