Informatics 121

Collaborative Kids' Play Dollhouse

Design Studio 3

Submitted By

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Introduction

Our team is designing an electronic dollhouse for an unspecified but very well known toy company for a target audience of 4-7 year old kids.

The essence of this design project is to create a collaborative kids play dollhouse and provide kids a engaging and fun playing environment. Capturing the design aspects of dollhouse play - placing furniture and playing with dolls in and around the house - and extend that to a collaborative experience online, wherein the kids can play with friends and make new friends.

Audience

- Children who are interested in online visual doll house (4-7)
- Parents (if we allow parents to play along with their kids)
- Stakeholders

Other Stakeholders

- Investors
- Toy company Executive
- Parents (if not allowed to play along with kids)

Goals

- User friendly (easy to use)
- Maintaining game security (Kid friendly, no bad language, keep it PG)
- Ability to automatically save progress
- Each kid has individual login
- Ability to invite others to collaborate on designing dollhouse
- Have a design template of house structure with different themes
- Able to work on multiple houses at a time
- Ability to make profit for the company
- Providing the best user experiences for kids

Constraints

- Depending on how system is set up, will we allow kids to build more than one house?
- Maximum amount of users collaborating on one dollhouse.
- Limit to one avatar per kid
- Age limit for usage(possible constraint. ex. Certain age groups not being able to access system, maybe those under 4 and those over 7)?

Assumptions

- parents will be monitoring their kids activity/ play time
- no ads
- have a good enough internet speed
- know basic computer skills

Ideas

- Able to create the house from scratch, including all the furnitures and pain of the house
- Each kid has his/ her avatar when logging in, will be using kid's real picture to create the avatar
- Tutorial
- Learning opportunity (npc quest/ achievement??)
- Have pets
- Have in game currency
- Parental settings
- Doll house listing

Design Methods

- Mind mapping - We employed a mindmap first to just get our ideas out and onto something tangible. This helped us to find an initial direction and start getting more ideas flowing, allowing us to start making our first decisions and moving forward. (see appendix)
- Feature Comparison - We used the feature comparison artifact in order to determine the competition from both major toy companies and free online dollhouse games. We wanted to determine whether our design features were competitive, original, and profitable for the toy company. (see Application design)
- Morphological Chart - The morphological chart helped bring order to some of our ideas and helped us very clearly make our decisions and represent those choices visually. (see appendix)
- Role Playing - A couple of us tested out other online dollhouses to see features, ask ourselves what we would have wanted to see, what us in the shoes of the children might like or dislike about the dollhouse as we went. Putting ourselves in the shoes of the kids allowed us to think about what these other designers might have been able to change.
- Prototyping - We developed mockups of potential in-game screens to visualize some of the ideas we had described verbally. (See appendix)
- Personas & Scenarios - Our team developed personas and scenarios to be able to visualize the interaction between various users and the application. These scenarios allowed us to gain a better understanding of the preferences of users with different interests. (See appendix)

Application Design

These are the finalized decisions which will determine what features will be in our final product.

Decisions

- What should we do if the kids grow up (not in the range of 4-7 anymore)
    - **Decision:** no limit
- Should each kid only have one account and each account only one avatar?
    - maybe have them have a certain amount of avatars for free and unlock more the more points they earn?
        - **Decision:** one avatar, customizable by the user
- Maximum amount of people can work on a house? Or no max?
    - **Decision:** default amount but customizable up to a limit we set based on the house size. A small house might be limited to 8 people by us, whereas a large house may have a higher limit like 16.
- Mini-games in our application?
    - **Decision:** no mini-games initially
- Should the parents be able to have an account as well (play with their kids)
    - **Decision:** no, but have parental settings, which can be stored in each kid's account. Perhaps only the parent can access those settings through some sort of password
- Free to play or not….if not free to play what will be the price?
    - **Decision:**
        - Software will have upfront cost but no concurrent fee
        - Game will have in game currency
            - Can buy game currency with real currency
            - Achievements / quests will give game currency
            - Daily login currency
- What other ways we can make kids "collaborate"?
    - Ability to gift items to other friends, such as let's say kid a won/unlocked a household item, should we allow the kid to gift/request exchanges with friends for different household items? (i.e. meez.com)
        - **Decision:** Yes
    - Weekly competitions for best houses?
        - **Decision:** Not at first, but a consideration for future options
    - Perhaps a chat feature?
        - **Decision:** Yes, but ensure it is appropriate by having banning/censoring features if a kid cusses/etc.

    - Have user profiles like myspace/facebook profiles where they can add friends to play with/collaborate with
        - **Decision:** Can see if friends are online and, if so, can send game invites
        - **Decision:** Badges and awards can be displayed on user's profile
        - **Idea:** Maybe like a buddy point system that encourages kids to play together and earn more points than they would playing on their own?
            - **Decision:** We did not feature a buddy point system, but the players can add friends and visit friends to complete quests and goals, which yield in-game rewards
- Designing options?
    - **Decision:** We want kids mainly focusing on interior of the dollhouse and small features (plants, trees, etc) on the outside.

- 2D / 3D?
    - **Decision: 2.5 D**
        - 2.5 Dimensional space gives the appearance of 3 dimensions by having a diagonally set overhead camera that shows depth and this allows complete freedom of movement horizontally. The only restriction is on vertical movement, which can still be simulated for the sake of transitioning between floors of the dollhouse; instead of the player character actually moving up or down in space, it simply moves to another 2 Dimensional layer that is portrayed visually as being above or below the other layers.
- Pets?
    - **Decision:** Yes
- Open world?
    - **Decision: Semi-open**
        - 3rd person point of view

Feature Comparison

Criteria for Feature Comparison

- Number and variety of items
- World View
- Interactions between user and house (including household items)
- Expense of playing game
- Popularity

Competitors

- Actual companies:
    - Mattel
        - https://play.barbie.com/en-us/game/Mega-Mansion-Makeover
            - Pros
                - Well known brand, popular among girls
                - Diverse doll selection of Barbie posing in different manners
                - Ability to place several rooms easily and wherever
                - Can choose well known cities to live in
                - Can have several tiers
                - Free-to-play
            - Cons
                - Dolls are static, basically inanimate
                - Very limited household inventory
                - Items appear to be too huge for the room
                - Set room templates which can't be modified
                - 2D view
                - Inability to rotate items or rooms
- Free flash games:
    - http://www.gamekidgame.com/barbie_my_scene/my_scene_room_makeover.html
        - Pros
            - Simple
            - Items automatically placed for you
            - Free-to-play
        - Cons
            - Only one room
            - Selection of items is limited
            - Items automatically placed for you (can be limiting for the user if they wanna drag their items somewhere else in the room)
            - Inability to rotate items
    - http://thefrozengames.com/disney-princess-doll-house/
        - Pros
            - Has a twist: users have to memorize the unique rooms of the princesses and the purposes is for them to correctly place the items in the rooms
            - Can choose difficulty level of game
            - Can choose items from a selection of items
            - Items are draggable

            - Well known dolls: Disney princesses
            - Free-to-play
        - Cons
            - Static dolls, no interaction
            - Items are not sorted by section, it is just a long list
            - Inability to edit room template
            - Inability to edit items
- PC games:
    - The Sims series
        - Not a direct competitor, but some of the functionalities that we want for our system overlap with the functionalities in The Sims series. It is more of an inspiration for our design that we are borrowing some concepts from.
            - Functionalities:
                - Ability to edit rooms
                - Visit neighbors
                - Neighbors are NPC (non-playable characters)
                - Ability to edit one's sim.
                - Store points system which allows users to buy accessories and other household items
                - Have pets
    - Minecraft
        - Not a direct competitor, but some of the functionalities that we want for our system overlap with the functionalities in Minecraft. It is more of an inspiration for our design that we are borrowing some concepts from.
            - Some special functionalities:
                - Mining for items (Essentially collecting items)
                - Collaboration with others
                - XP (Experience) points

Analysis

The biggest competition for our game would be the actual toy companies, as well as PC games. Toy companies like Mattel have the advantage of their name brand products being featured in their online doll games such as Barbie, which is popular among the target audience for the game. Games like The Sims series and Minecraft have the advantage that their worlds are more open and the users have more freedom to do what they like, such as creating their own worlds and actually simulating life. However, the advantage that our game would have over these games would be that our game is specifically targeted towards kids who are 4-7, and there are features that will be moderated for their safety, such as chatting. The advantage that free online games have over our game is the very fact that they are free to play. We have decided that in order for the company to make profit off the game, there will be a price that the parents will have to pay in order for their children to play the game. However, our game will overcome this difference and will make children want to play our game because there

are features that allow the children to have more freedom in gameplay. Some of these features include the ability to move one's avatar, rotate items and place them on any allowable grid on the house, and collaborative play with others. This advantage also applies to Mattel's online dollhouse because it follows the same format as the free online doll houses.

Trade-offs

Open World

Pros

- Make new friends
- Explorative
- Look at other people's design
- More interesting / alive / not as empty
- More collaborative?

Cons

- Trolls
- Can get too complex
- Uncertainty
- Need better computer specs
- Potentially crowded digital space
- Harder to control / maintain
- Parents have less control of what kids are exposed to

Exterior decor

- Our team thought about adding complex exterior decor such as a pool, jacuzzi, and sports, however, we chose to not make any complex decor and kept it minimal to focus on the essence, the interior design of the dollhouse.
- Think about what we are not designing

Interaction Design

Movement

We decided that a simple movement scheme with right clicking the desired location to move to would be best. Simplistic controls will reinforce the simple nature of the act of playing with a dollhouse, but will still provide the control and interactivity that make it appealing, particularly in the digital format.

Navigation

We wanted navigation between menus and features to be comfortable and easy, so we incorporated a navigation bar in that allows you to access each of the game's most significant menus from the main game screen.

Interaction

We allowed the avatar to interact with the various objects in the game. Users will be able to interact with pets, plants, kitchen equipment, and other common appliances and furniture around the dollhouse.

To keep the game simple, we wanted to make movement, interaction, and navigation appropriately simple -

Architecture Design

Architectural Style

Given the opportunity to choose between peer-to-peer, client-server, and a combination of both, we chose to go with the fusion approach. Certain aspects of the experience will occur peer-to-peer such as messaging, visiting friends, and visiting the random portal. Other aspects, such as the dollhouse layout, color options, and furniture choices, user quests and missions, and user profile information will be saved to the server. This fusion style can allow the finished product to capitalize on the positive aspects of both architectural styles.

Classes

Class GroundFloor

- Width
- Length
- Map

Analysis:
The GroundFloor class represents floors of our dollhouse, keeping width and length for quick reference. The Map variable is a 2 dimensional array that actually stores the furniture/items that occupy its spaces.

Subclass UpperFloor (Inherits from GroundFloor)

- Width (inherited)
- Length (inherited)
- Allowed items

Analysis:
The UpperFloor functions essentially the same as a GroundFloor, allowing the user to place their items. However, it restricts what items can be placed by having a list of allowed items, preventing the user from placing certain items on higher floors.

Class User

- Create account
- Username
- Password
- Login
- Logout
- Load
- Save

Analysis:
The user class consists of the fundamental aspects of any game. It allows the user to create an account, login, logout, and load and save their progress.

Class Settings

- Game Settings
- Colorblind mode
- Language
- Video Settings
- Audio Settings
- Quit game

Analysis:
The settings class allows the user to personalize his game settings and adjust video and audio settings accordingly.

Class Movement

- Right click to move
- Left click to interact
- Scroll

Analysis:
The movement class allows the user to move their avatar from location to location on the map. The user can right click to move to an area, and left click on an object to interact with it if the object allows for interaction.

Class Avatar

- Gender
- Hair color
- Hair style
- Face features
- Template dolls based on toy company's
- Personalize avatar
- Personalized face (can add picture of user's face)
- Body
- Shoes
- Clothes
- Skin color
- Accessories
- Name

Analysis:
The avatar class allows the user to fully customize their persona that they will be using to navigate in the game. The class allows personalization ranging from facial features to accessories. This class also maintains the personalization settings for the user's in-game appearance.

Class DollHouse

- Starting Template or create from scratch
- Design toolbox (just like sims)
- Design store (to buy new items)
- Name dollhouse
- Add different rooms
- Add different furniture
- Add colors
- Add floor tiles
- Add decorations / Accessories
- Doors
- Windows
- Plants
- Pets

- Naming dollhouse
- Floors

Analysis:
The DollHouse is the central datatype that tracks how to represent the user's dollhouse. It has a set of tools and items with which the user can design their dollhouse and options allowing them to change the actual layout and structure. They can have doors, windows, plants, and pets, and this class will keep track of all of them. The dollhouse can also be named by the user. The dollhouse also contains multiple floors which are filled based on the info as the user uses all of the "Add" functions. One note: Avatar is not contained within the DollHouse, but has a visual representation that interacts with the dollhouse when the user is playing.

Class levels
- Every 10 unlock tiers of designs
- Every level earn in game currency
- Opportunity to unlock the ability to own more dollhouses.

Analysis:
A level system will be employed to reward users that play the game frequently. Users, upon reaching level milestones, will unlock special/higher tier furniture sets that give them more options to customize their dollhouse. At specific, more rare milestones, users will also unlock the ability to have more dollhouses.

Class DollHouseYard
- Friend portal
    - Travel to (list of friends)
- Random portal
    - Default amount of people entering house. Kid can change max number of people
    - Close portal, open to invite only, fully open portal.
- Plants
- Trees
- Grass
- Allowable items

Analysis:
The friend portal is how users can choose a friend's dollhouse to visit. The random portal both lets users visit random people to make new friends or change the settings of theirs. Note: The random portal will only take you to a person whose chosen language is the same as yours, whereas the friend portal lets you visit anyone on your friends list. This class will have a map of allowable items

Class security

- Block out curse words with stars
- Block trolls
- Check for spam
- Any shady activity
- Inappropriate pictures

Analysis:
The security settings are not user controlled, but instead enable the maintenance/operations team to manage the game and the community.

Class quests/minigames

- Completing quests with others gets more points / in game currency
- Various quests per day
    - Eat food
    - Water plants
    - Care for pets
    - Visit 3 other houses today

Analysis:
Quests are incorporated to reward users for reaching milestones and accomplishing certain tasks. The quests encourage the players to be active, interact with friends, and make new friends.

Class Social

- Add friend
- Delete friend
- Message friend
- Speak in chat box
- Notification of friends' achievements
- Request to do quests with friends
- Request to visit friend's house
- Request to gift/trade items with friends
- Give friend permission to edit dollhouse
- Take away permission to edit dollhouse
- Kick friend from house
- Set default max occupancy (based on size of house there is max occupancy)

Analysis:
The social class implements all of the communication between users. The class allows users to collaborate with each other to build the dollhouse. The social class also lets users trade items with each other, collaborate on quests, and interact with items in their house.

Class Money

- Daily login
- Visiting friends
- Collab with friends
- Quests w/wo friends
- Level up (XP)
- Trading
- Making new friends

Implementation Design

World type:

Our team discussed the type of world that the user will experience. An open world map consists of a world where all user avatars can walk around and visit other users' dollhouses. Users can socialize with any other user on the map. Having an open world can make the game explorative, alive, and full of users building and customizing their own dollhouses. Users will have the opportunity to make new friends, and see other designs. A non-open world will focus only on the user and his or her dollhouse. The map would essentially consist of the user's dollhouse, and focus on the design and development of their dollhouse.

Our team chose to develop a semi-open-world design, which is a fairly new idea. This consists of a closed world, with access to the worlds of other users. Essentially, each user has his or her own world which consists of just their dollhouse and their backyard. Additionally, we developed portals in the backyard of the dollhouse to allow the user to visit friends' dollhouses and additionally, random dollhouses, to allow for collaboration. We believed that having an open world map would be too complex for the age range of the game. Moreover, if we had developed an open world game, many children children playing the game would be more exposed to profanity.

Dimensions:

Our team chose to use 2.5 dimensions for the game. An example of that dimension is displayed in our mockups. Our team decided that two dimensions is seen as prehistoric and underdeveloped, while three dimensions would be too complex to build and to run.

Collaboration ideas:

The main focus of the game is the collaborating with other users to build the dollhouse and creating a fun and engaging experience for all users. Our team therefore team thought of many collaboration ideas.

- Portals

The first collaboration idea we developed was the addition of portals to visit other users' dollhouses. Because team decided on a semi-open-world map, we wanted to develop a cool and creative way for users to collaborate with their friends on their dollhouses, and to meet other individuals. As a result, we thought of the idea of

designing two portals, one for visiting friends and the other for visiting a random individual who speaks the same language (in the same country) and also has their random user portal open.

- House editing

Our team decided to allow users to collaborate with other individuals on the construction and design of their dollhouses, if and only if the user that owns the dollhouse allows for it. The user can allow and block certain individuals from editing his or her house, and can also kick individuals out of their house/world.

- Quests

The team also created a set of quests that a user can partake in to gain experience and in game money. Users can also collaborate and partake in quests together to gain more points and money, which advocates for collaboration. The quests consist of feeding pets, designing houses, cleaning and even just visiting a friend or a random user's world. The addition of new quests is possible in the future. This decision was made to keep the user stimulated and interested in the game.

- Same language Portal

As described above in the porals section, our team developed portals to visit other individuals. However, one decision we made was that the random person that each user visits will be in the same country as the user to allow for a common language ground, since anyone in any country can play the game.

- In game Currency and Leveling up

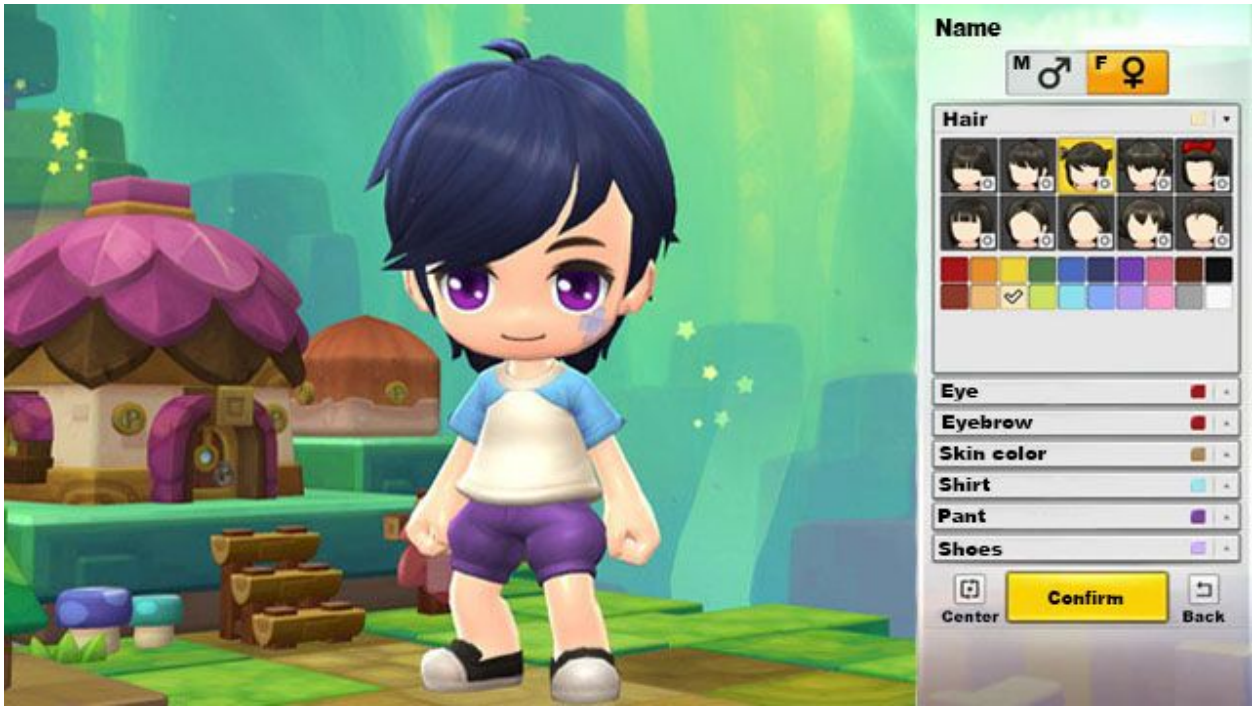
In order to entice our audience, our team design an in game currency system in which users can login, complete quests, or collaborate with individuals to earn. Additionally, as the user plays the game and accomplishes the above tasks, they will gain experience points which will level them up. Our team did some research on these effects, and discovered that these features will have a psychological effect on users, stimulating them to keep playing the game to make more money or to level up, even though the kids are at a young age.

Appendix

Morphological Chart

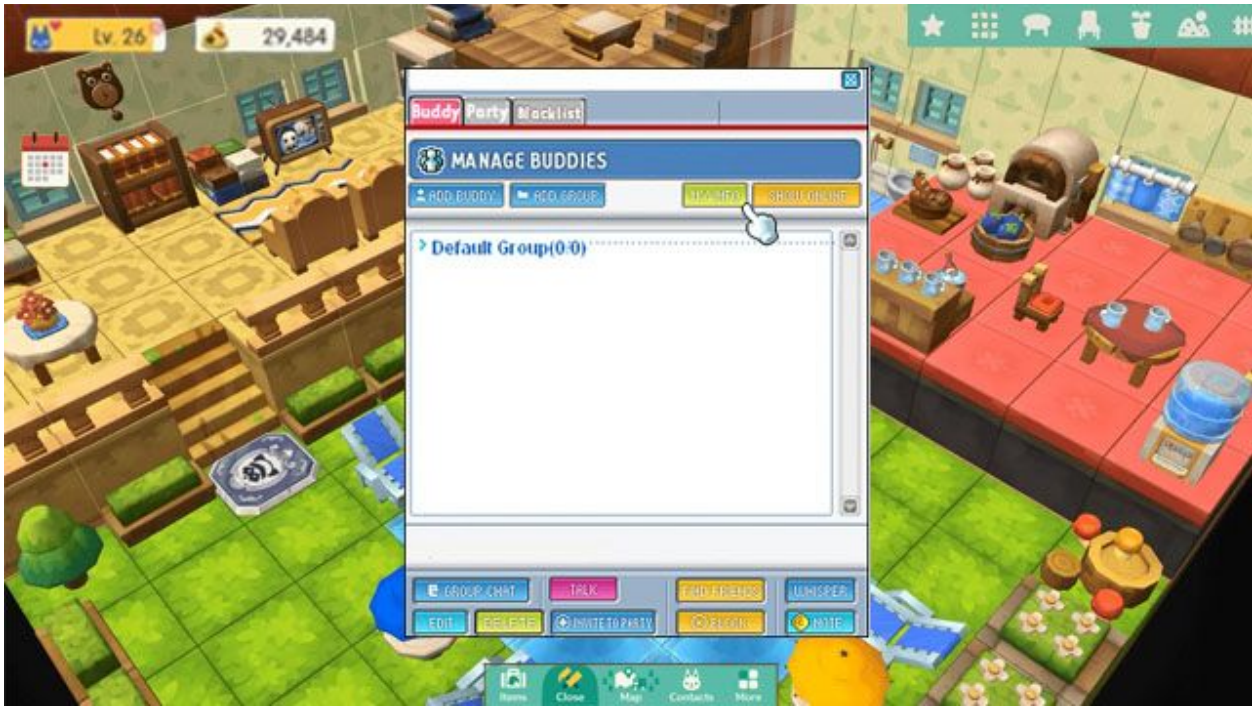
Morphological Chart					
World Design	Open-world (a world to roam around)	Semi-open (some roaming)	Limited (just dollhouses)		
Avatar	Many per profile	Only one per profile	More to unlock	Can be bought	
Dollhouse Perspective	2D	3D	2.5D	Virtual Reality	Real Life
Movement	Keyboard (A,W,S,D)	Keyboard (up,down,left,right)	Mouse right click	JoyStick	Voice Command
Messaging Style	Above avatar head	Messagebox	Private message	Multiple Types	
Language	One Language	Multi-Language	Only English		
Placement	Common language	Drag and drop	Code commend		
Server	NA only	Worldwide			
Messaging types	Text only	Audio	Emojis		
Architectural Design	Peer-to-Peer	Client-Server	Fusion P2P and Client-Server		

Mockups



Character creation: Able to choose name, gender, hair style/color, eye color, eyebrow, skin color, shirts, pants, and shoes.

UI layout: Interior of the house design and the location of some tools, includes daily login quest (calender on the left), Levels and in game currency (top left), main tool box (bottom middle), crafting/buying box (top right).

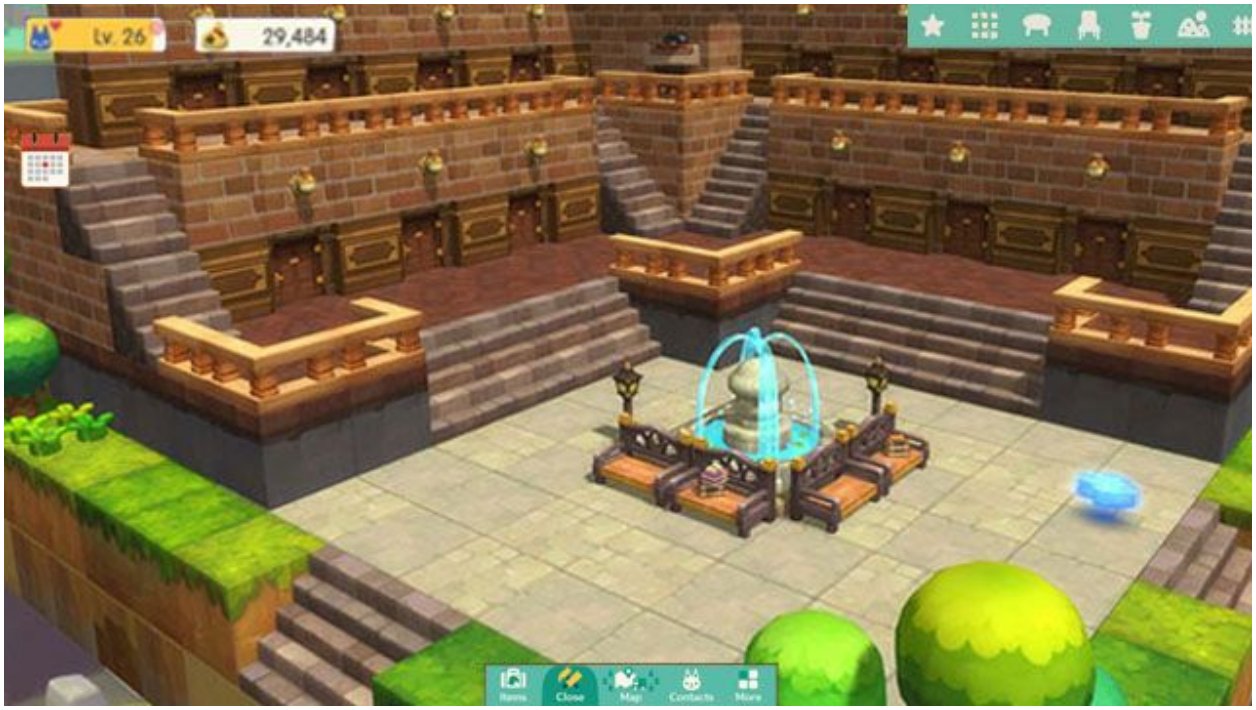


Friends box: which includes buddy (your friend), party (people that are able to edit your house), blacklist (people that won't be able to view or edit your house).

Daily login: The calendar icon on the left side take you to the daily login screen, which tells you if you are on a login streak or not.

Furniture placement: player will be able to place furnitures by drag and drop from the menu to the map. Before the furniture will be a red box that indicates you where will this item be place. The black arrow around the item will give player the option to rotate the item.

Collaboration: Other players will be able to visit your house (some can even edit it if you give them permission). Players can interact with each other by typing in the chat box (bottom left) and the chat bubble will show up right above players avatar.



Outside of the house: Once the player is outside of his/her dollhouse, players will be able to visit their neighbor by clicking on the blue arrow (portal) on the screen. It will take you to a random neighbor's house with the same language setting.

Mock up reference

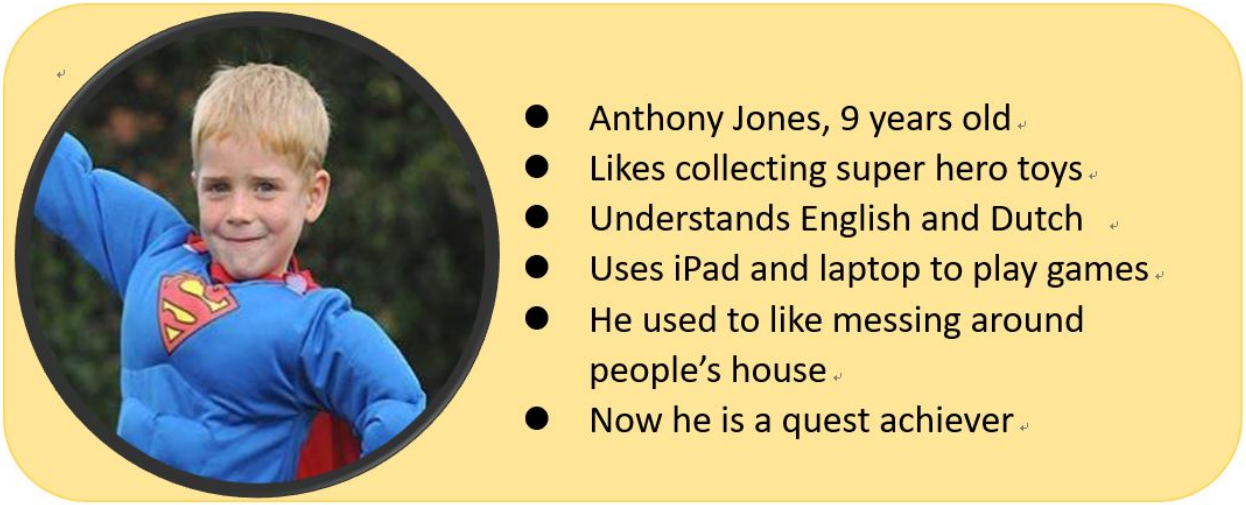
- Characters/ maps: Maplestory 2
- Toolbars: Animal crossing, Maplestory 1
- Icons: Google image search

❑ Personas

- Emily Smith, 4 years old
- Likes painting and collecting dolls
- Understands English and French
- Uses iPad and laptop to play games and watch shows
- Likes playing games that she can earn prizes

- Bryan Williams, 5 years old
- Wants to be an interior designer
- Plays online games on computers on the weekend
- Understands English
- Likes dogs
- Feels a sense of achievement

- Angela park, 6 years old
- Likes to collect dolls and princess
- Doesn't understands English but Korean
- Uses iPad and laptop to play games
- Enjoys decorating her dollhouses
- Likes to make new friends and collaborate with her friends



❑ Scenarios

Scenario-1

Emily's mom opens dollhouse app on her laptop.
Emily's mom follows the instruction and sign up for her daughter.
Emily starts to decorate her dollhouse.
She paints the living room and the dining room.
She gets 100 coins by painting those room.
She buys her first doll.
Emily likes this dollhouse app so much because she thinks it's cute and she can earn prizes.

Scenario-2

Bryan opens the dollhouse app on his mom's computer.
He feeds his dog and waters his plants.
He adds some more furniture in his house.
He visits his friends house and has dinner there.
He levels up to level 12.
He thinks this dollhouse app is fun and easy to use.

Scenario-3

Angela starts using this dollhouse app when she was 5.
She has a lot of in game currency and more a bigger house than others.
She buys a lot of dolls and princess since she likes collecting them.
She has known many friends through the app because she can click on visit random individual's dollhouse button, and the system will take her to a dollhouse whose owner only speaks Korean. She often exchanges furniture with her friends because she wants her house looks prettier.

Scenario-4

Anthony has been on this app for half a year.
He used to go visit his friends' houses, but messed around their houses.
He got blocked by two of his friends.
He noticed that he couldn't get into those two friends' houses.
He learned that he cannot messy around with others' houses.
Now, he is a quest achiever, he finishes a good amount of quests every time he gets on the app.

Client interaction

The user will interact with his/her avatar by right clicking on the desire place he/she wants the avatar to move to. Left clicks will be interaction between other avatars, drag and drop furnitures, and interact with the settings of the game.

Logs

Date	Team Member	Design artifact	Motivation
11/17/17 10:00 am - 11:00 am	Nick - writer Rest of team - collaborators	Mindmap	To come up with ideas for the dollhouse.
11/21/17 5:00 pm - 6:00 pm	Whole team	Scope of work	To make high level decisions about what work will be done to develop the project.
11/28/17 5:00 pm - 6:00 pm	Whole team	Brainstorming/design decisions	To come up with ideas for design and finalize the scope of our project.
11/30/17 1:30 pm - 3:30 pm	Whole team	Separate workload	To split up work for the project.
11/30/17 5:00pm - 6:30pm	Cynthia Aguilar	Feature Comparison	To determine competitive features for our product and to examine what is currently out there in the market.
12/3/17 1:00pm - 4:30pm	Edward Fu	Mock ups	To show the design of the app
11/30/17	Nick Dadeh Logan Graham	Classes / Class descriptions	To show the various classes and methods that develop our design
12/2/17 7:00 pm - 10:00pm	Tzu-Ling Wang	Personas and scenarios	To see what user's needs are and provide a future use of the software.
12/5/17 5:00 pm - 6:30 pm	Whole team	Final Document	Review previous work, make modifications if necessary, and finalize document.
12/7/17 4:30 pm -	Whole team	Final Document, Morphological Chart	Refine and polish the final document