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## 404 ERROR Project

### Mission ☽

*Not only develop a fully functional product for dot-connecting assessment that can be deployed on PC, MAC and ipad. But also make it easy to maintain and user friendly.*

## Team Members



Scrum Master

**Cheng Chen**

[@Cheng Chen](#)



Project Owner

**Steve Chen**

[@STEVE CHEN](#)



UI Designer

**Daxuan Yue**

[@Daxuan Yue](#)



UX Designer

**Jiaxing Fang**

[@Tom](#)



ralthubaiti

UI Designer

**Raad Althubaiti**

[@Raad Khalid A Althubaiti](#)

## ✓ Client Needs

Functional Requirements:

- The circles have to be in an even gap
    - circles can be colorful, images, anything imaginary excellent
  - **Dots need to be evenly spread and have constant shapes (such as radius and picture)**
  - QR code scan
    - Before starting the test, the child needs to scan a QR code to get all students' names and IDs in that classroom and then they can select their name from a drop-down list.
  - Dot interaction test:
    - There will be a fixed original picture shown on the left side of the screen and a space with 16 dots in a 4X4 shape spread evenly on the right side
    - There will be 3 tasks.
      - Draw the original picture in the same way
      - Draw the vertically reversed picture
      - Draw the horizontally reversed picture
  - Testing:
    - Two test choices, 1 short test, and 1 long test.
      - For the long test, there are 3 questions in total, after completing each of them, there is a choice to submit or retry.
      - For the short test, only the first question will be shown. The congratulation page will appear after finishing the 1 question no matter success or not.
    - If click submit and the answer is correct, go to the next test
      - When a player finishes the last test or fails one test, the process terminates
      - Shows the congratulation page after the child finishes the test
      - Send the collected data back to the server in a fixed form (need to communicate with the back end)
    - If they click retry, show the test again (need to confirm with client about should start at this ongoing test or should start at the first test)
      - When a player finishes the last test or fails one test, the process terminates
      - Shows the congratulation page after the child finishes the test
      - Send the collected data back to the server in a fixed form (need to communicate with the back end)
  - Scoring:
    - For each test, if the child submits and succeeds on the first attempt, he gets 2 marks. If he clicks retry and succeeds on the second attempt, he only gets 1 mark from that test. If he fails the test, no mark will be given.
  - Pass/Fail:
    - **Table A 4a: Minimum cut-off scores to pass the NDPA across various age groups**
- | Age (years) | NDPA |
|-------------|------|
| 5           | 2    |
| 6           | 2    |
| 7           | 3    |
| 8           | 4    |
| 9           | 4    |
| 10          | 4    |
| 11          | 5    |
| 12          | 5    |
- Data sending
    - Send the collected data (including age, grade, score, pass/fail) together with the student's ID back to the server in a fixed form after the player completes their test (need to communicate with the back end to decide the details)

- Voice Guide
  - There should be a voice to guide the players on each step (and probably give them some positive feedback when they complete a task) as some children taking this test could be under reading age level. This voice is better to be tender and child-friendly.
- Animation
  - There should be some small animations such as the waving flower but there should not be too many of them that would interrupt the children doing the test.
  - There can be some instruction animations to show children what they need to do.

Non-functional requirements:

- This project will be a web app so it is easy to cross platforms

Date	Update History
31/07/2023	<ul style="list-style-type: none"> <li>• Mobile App or Web App Decision</li> <li>• Program Process Decision</li> <li>• Play Process logic decision</li> </ul>
03/08/2023	<ul style="list-style-type: none"> <li>• Detail decision for the program</li> <li>• Scoring Planing</li> <li>• How to send Data</li> <li>• Voice Guide decision</li> </ul>
01/09/2023	<ul style="list-style-type: none"> <li>• Add pass / fail table (age / NDPA)</li> <li>• Add Non-functional requirements</li> </ul>
22/09/2023	<ul style="list-style-type: none"> <li>• Add animation division</li> </ul>

## APP Version Update History

### Version 1.0.0 11/11/2023 Updated

- Fix known bugs
- Finished all tests
- Fix the low-resolution problem when entering the website by using a mobile phone, now when entering the website by using a mobile phone, it should have same performance just like on tablet or computer
- Implement Cat and Sun Animation
- Implement the behaviour after click on Cat and Sun
- Implement the Voices when click on cat
- Implement the short test
- Code Reviews, add fully comments to all codes.
- Remove all useless buttons and test buttons.
- GitHub re-management

### Version 0.-1.5 18/10/2023 Updated

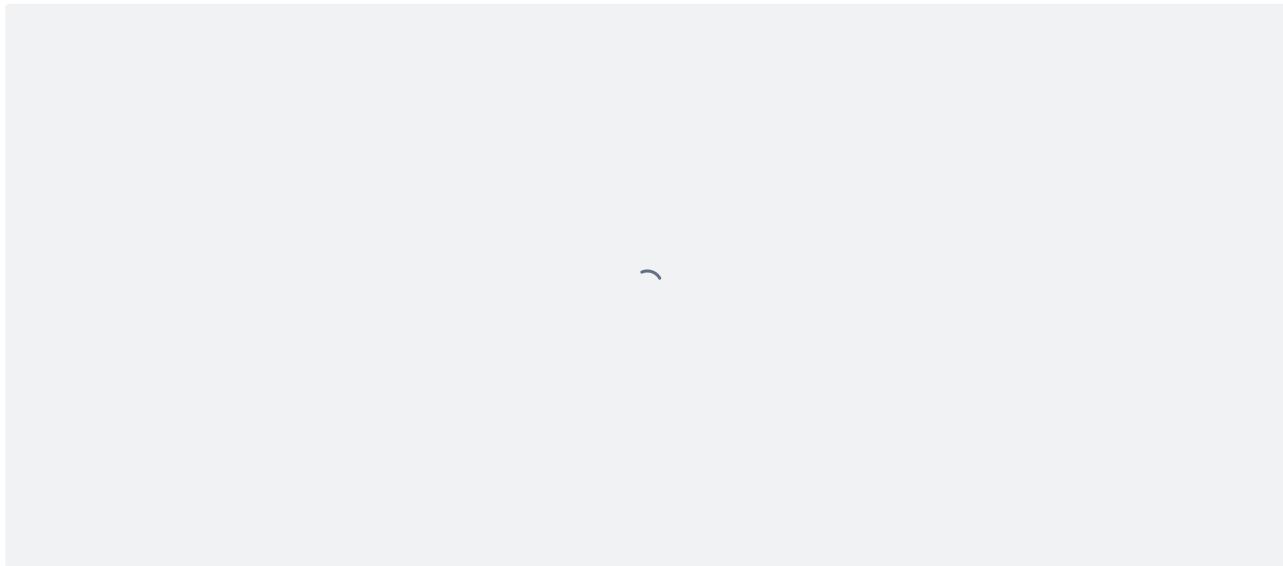
- Fix known bugs
- Implement Line Animation for instruction demo
- Change the screen self-adaption logic and the scale of the screen
- Initialize the test cases
- Sync the voice guide and line animation
- Implement voice guide
- Reconstruct the building logic to auto-fill the browser
- Check addition button partners
- Code Reviews
- Deactivate the test elements on the page
- Final implementation of buttons
- VIS Cat Animation
- New Page for short test and long test
- API Implementation

### Version 0.-1.4 22/09/2023 Updated

- Add User Information input interface
- Add more UI Pages
- Complete the PlayPage Logics
- Check the Game Processes
- Function to Check whether the line connection is correct
- QR Code Scan
- Full-Screen Adaption
- QR Code Data Collection and Implementation
- AI Voice Implementation

## Version 0.-1.3 18/09/2023 Updated ↗

- Fix Some Bugs
- Intro Animation when you start playing
- Animation that large dot when the mouse in it's bound
- Review the code and improve the basic structure
- Add Start Game Scene
- Add Scan Scene
- Add Name Selection Scene
- Comment Codes in two languages
- Implement the intro animation to pop out the matrixes
- Fully UI Implementation
- Fix UI Self Adaption Problems
  - Now able to fit in most kinds of devices, except
    - Some iPads have a special height ratio



## Version 0.-1.2 08/07/2023 Updated ↗

- Create a relative 4\*4 Dot Matrix
- Maintain the matrix and lines in the performance part
- Follow and track the customer's input, get the data of the connection
- Add simple UIs which are used to track the state of the line connection
- The line will fade away slowly after the Mouse button-up
- Check the results after finishing the level

## Version 0.-1.1 08/07/2023 Updated ↗

- Create a Simple 4\*4 Dot Matrix
- Line's extension follows the Mouse Movement
- Restrict the line's spawn area
- Line automatically attracts to the dots
- The behaviors of the Mouse Button down / up
- Test the validity of Web compatibility



 Meetings

# Meeting 05/08

Meeting time: 120 mins ↗

Engine/language	Pros	Cons
Unity(WebGL)/C#	<ul style="list-style-type: none"> <li>• Cross Platform</li> <li>• Relatively easy to develop</li> <li>• Do not need too much code</li> <li>• Has a lot of extension choices</li> <li>• Large community with lots of art assets</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Optimization</li> <li>• Large Size</li> <li>• Licensing Costs</li> </ul>
Flash	<ul style="list-style-type: none"> <li>• Animation Capabilities</li> <li>• Browser Compatibility</li> </ul>	<ul style="list-style-type: none"> <li>• Security Vulnerabilities</li> <li>• Outdated</li> </ul>
HTML5, JavaScript and CSS	<ul style="list-style-type: none"> <li>• Fully customizing the app</li> <li>• Extremely lightweight</li> </ul>	<ul style="list-style-type: none"> <li>• High code language requirement</li> <li>• Complex creation</li> <li>• Hard to fit different platform</li> </ul>
Godot/GDScript and C#	<ul style="list-style-type: none"> <li>• Cross Platform</li> <li>• Easy to Use</li> </ul>	<ul style="list-style-type: none"> <li>• Didn't use it before</li> <li>• Platform support is not that stable</li> </ul>
Phaser/JavaScript	<ul style="list-style-type: none"> <li>• Easy to Use</li> <li>• Cross Platform</li> <li>• Open Sources</li> </ul>	<ul style="list-style-type: none"> <li>• Limited Built-in Tools</li> <li>• Community-Driven Updates</li> </ul>

We considered various different options which are listed above. The Flash was firstly out of choice as it is outdated and some browsers (such as Chrome) already stopped supporting it. HTML5, JavaScript, and CSS are also not considered as it does not have built-in functions such as other engine and requires a lot of lower-level management. Unity, Godot, and Phaser have some shared advantages such as ease for cross-platform, a lot of extension choices, and ease of use. However, we finally chose to use Unity. The main reason is that some of us already have some development experience of Unity, this helps us shorten our study period so we can spend more time on development and testing.

Name	Finished	Todo	Problem
Steve Chen	-	Study unity, do a demo for age and grade choose page	-
Cheng Chen	Unity demo for dot interactions game	Develop the further version of demo.	<ul style="list-style-type: none"> <li>• UI problem</li> <li>• Think about whether to create the prefab templates.</li> </ul>
JiaXing Fang	-	Find voices for the project. Learn the audio edition tool.	

Daxuan Yue	-	Looking for UI design element. Learn UI design disciplines.	
Whole team	Decides the engine and language need to be used for this project.		

## Meeting 13/08

Meeting time: 120 mins ☕

**Things did during the meeting:** ☕

1. Introduce what we have done to the new team member.
2. Talk about what has been done since the last meeting.
3. Talk about the information the project owner gets from the client.

# Meeting 18/08

Meeting time: 100 mins ↗

1. Do we need background music?
  - a. OK, but the music must not be distracting and can be turned off.
  - b. Need to consider the IP problem.
2. How will the retry work?
  - a. Each task 1 retry.
3. Pass/fail?
  - a. Based on age and score.
4. Is UI style OK?
  - a. We don't need to show the score.
  - b. For the result page, we can only include words like "Congratulation" or something else, we don't need to show children their results but store them in the data system.
5. Do we need instruction animation?
6. What data needs to be sent to the database?
  - a. Location/School
  - b. Name
  - c. Score
  - d. Pass/Fail
7. Need a server?
  1. Need an option to choose the version of the test. A simple version only includes a copy task and a full version.
  2. No need to show the score on screen during the test.
  3. Don't need to show the score and pass-fail after children have done their test.
  4. Needs an animation after the children finish their test.

# Meeting 01/09

Meeting time: 300 mins ↗

Things did today:

1. Code review
  - a. Explain the architectural structure of the code
  - b. Explain how the animation works in unity
  - c. Fix some redundant codes and simplify the repository
2. Finalize UI design
  - a. Implement UI into actual software development
3. Finish Sprint 1 Updated COMP30022 Progress Checklist

# Meeting 15/09

Meeting time: 150 mins ↗

1. Write the sprint planning document
  - a. Decide the sprint2 deadline is the end of week 9
  - b. Plan the jobs in sprint3
2. Discuss about improving the UI design
3. Discuss voice leading part
4. Do the stand-up meeting to make sure everyone is on track

# Meeting 22/09

Meeting time: 240 mins ↗

## Topic 1: User Story page ↗

- add new user stories to the existing page

## Topic 2: Dialogue - Voice Guiding page ↗

- Create the Dialogue - Voice Guiding page

## Topic 3: Sprint Retrospectives ↗

- added retrospective pages for every sprint
- sprint 2 retrospective is complete now

## Topic 4: README.md ↗

- completed the [README.md](#) of our GitHub repo
- pushed the new README.md

## Topic 5: Progress Assessment 2 ↗

- finalized and finished the progress assessment 2

# Meeting 06/10

Meeting time: 90min ☺

## Topic 1: Change the icon of the demonstration ☺

- Decide which new icon we are going to use
- Assign this task to Cheng Chen and Daxuan Yue

## Topic 2: Add a new select page between short and long test ☺

- Decide how it will look like
- Assign this task to Daxuan Yue and Raad

## Topic 3: Add new timestamp function ☺

- Decide there is no need to show the timer on the screen, just store it and send it to the backend
- Assign this task to Raad

## Topic 4: Decide to let QR code scan be the only way to get child info ☺

- Need to hide the type in function
- Assign this task to Cheng Chen

## Topic 5: Improve the bottom design to make it more like a bottom ☺

- Assign this task to Raad and Cheng Chen

## Topic 6: Fix the problem in the voice guide and add new dialogue ☺

- Assign this task to Jiaxing Fang

## Topic 7: Add new animation ☺

- Decide to add new animation to the cat and sun
- Assign this task to Daxuan Yue, Raad, and Cheng Chen

## Topic 8: Add a test form in Google Form ☺

- Assign this task to Steve Chen



# Meeting 13/10

Meeting time: 120mins ☺

**Topic 1: Make the ppt of presentation next Monday and practice it together.** ☺

**Topic 2: Decide to complete the animation of the cat and sun** ☺

- The animation part was assigned to Cheng Chen and the audio part was assigned to Raad.

**Topic 3: Review the feedback from other people and decide to test more people.** ☺

- For now, nothing needs to be changed based on the test results, something may change if more people are tested and report the same problems.

## Meeting 15/10

Meeting time: 90 mins ↗

### **Topic 1: Improve the slides of the presentation and practice them.** ↗

- Everyone joined and practices
- More content is added to the slides
- Time is separated evenly for everyone

# Meeting 18/10

Meeting time: 180 mins ↗

## Topic1: Finish the progress assignment 3 ↗

- Edit some of the confluence pages to the most recent state.
- Finish the Progress Checklist 3
- Done by Steve Chen

## Topic2: Add update history to all confluence pages ↗

- Done by Cheng Chen, Jiaxing Fang, and Daxuan Yue

## Topic3: Finish the Ethics and security report ↗

- Done by Raad and Daxuan Yue

# Meeting 10/11

Meeting Time: 240min ↗

## Topic 1: ↗

- Sync the GitHub repository and re-arrange it
- Remove useless branches
- Add final confluence document in GitHub

## Topic 2: ↗

- Last testing to make sure no further bugs
  - Fix the problem which has no response when pass the last level during long-test
- Record the testing video and post it on YouTube, this is the demonstration video

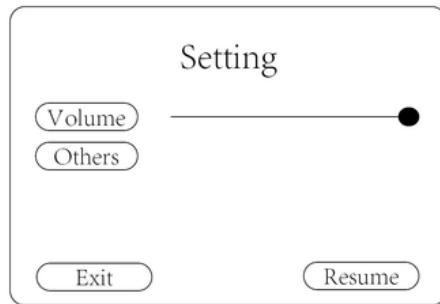
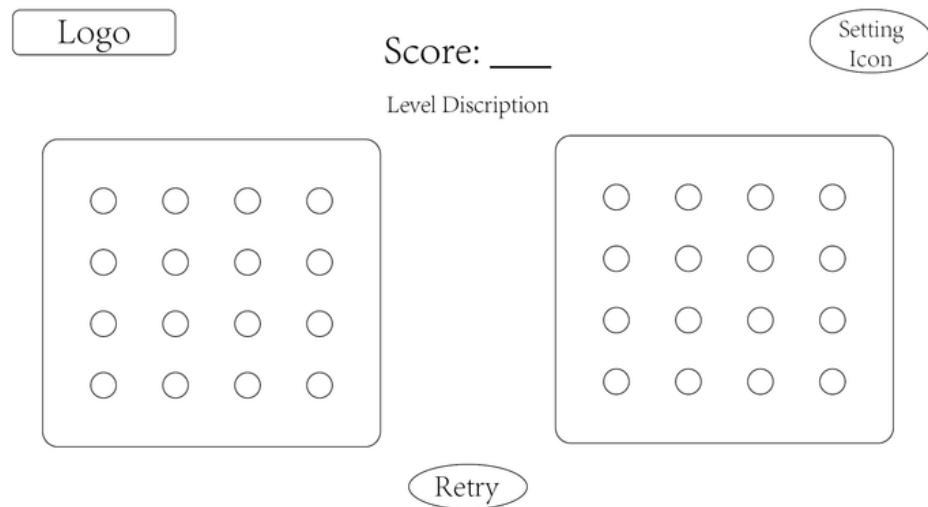
## Topic 3: ↗

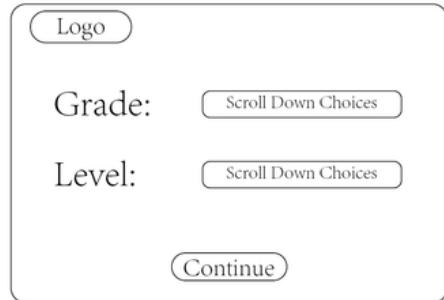
- Update Readme.md
- Document the confluence and output it in pdf
- Write product report

# UI Design

For the initial UI template, UI Designers need to finish the following quests:

1. The style, and background of the window: cartoon-style
2. Where each UIs (picture, materials) are? Uploaded on GitHub
3. What does Logo look like? Vis-CAT
4. What is the font? Gamja Flower





Cartoon version: (**FINAL DESIGN**)

Suggested @Raad Khalid A Althubaiti



UI Designs after Sprint1 ↗



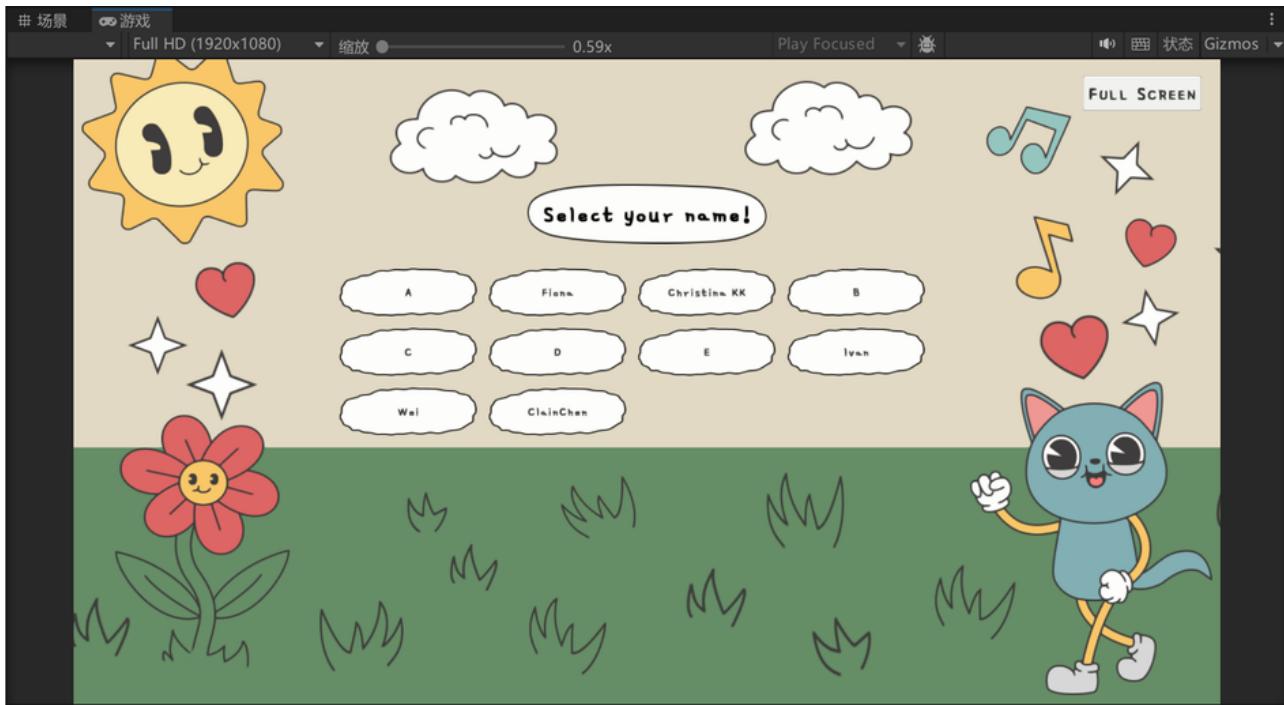
Start Page



Scan Page



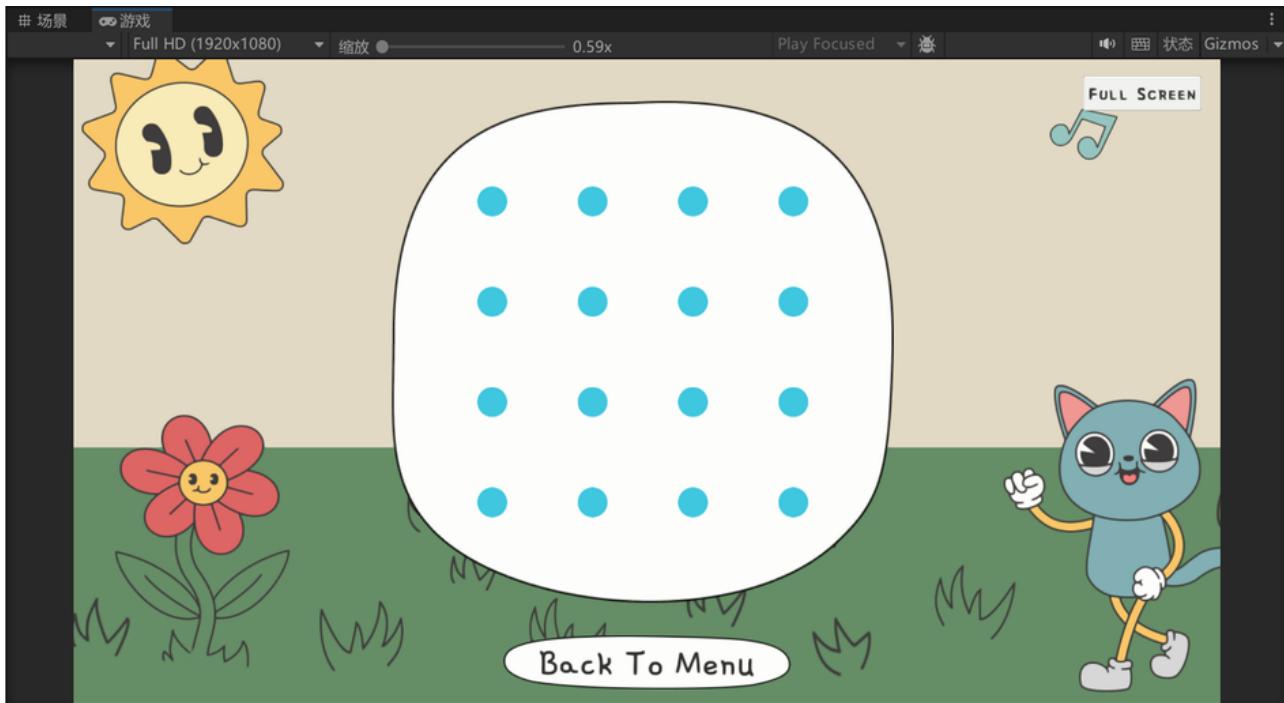
Select Page (Without names)



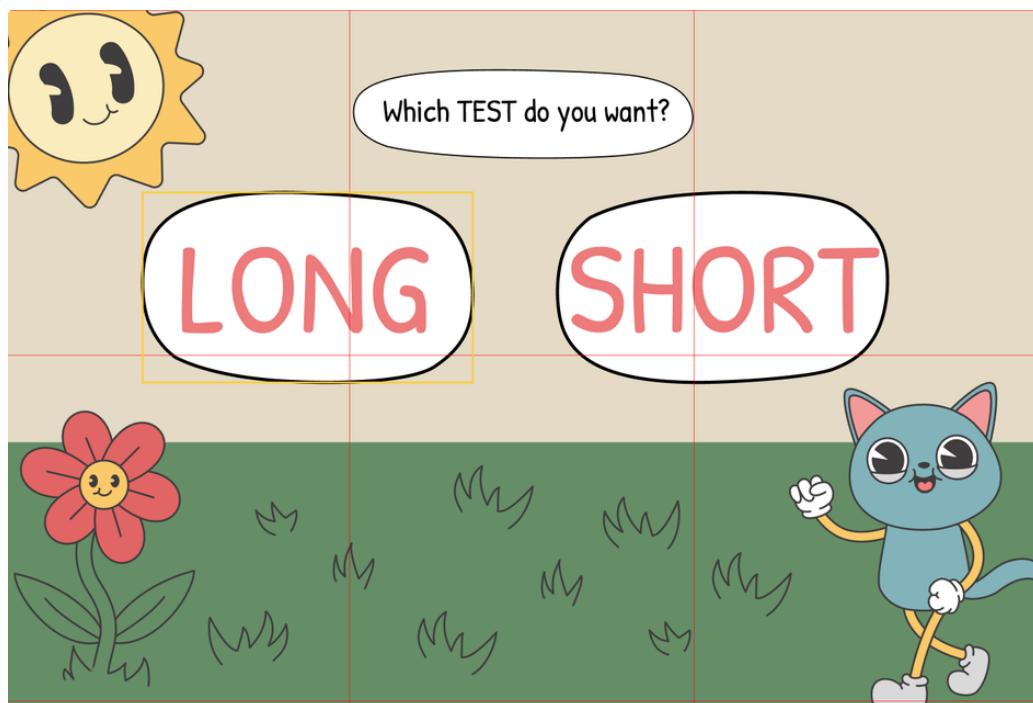
Select Page (With Names)



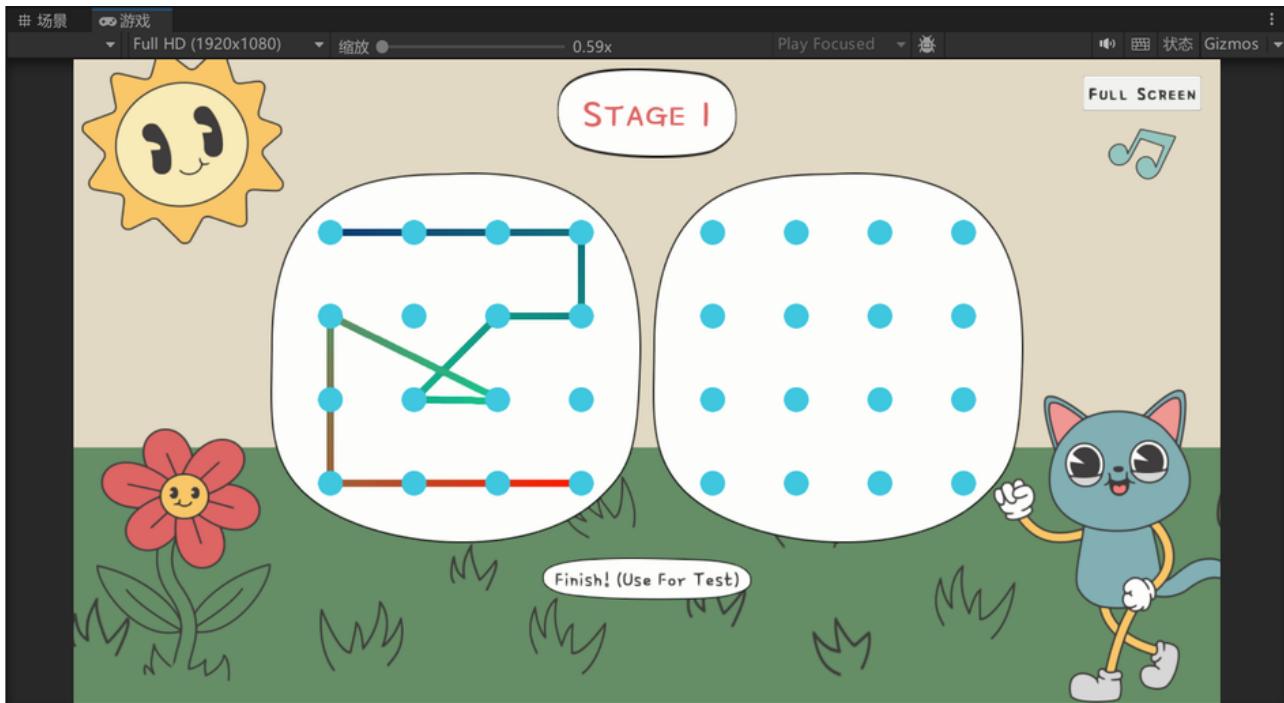
Intro Menu



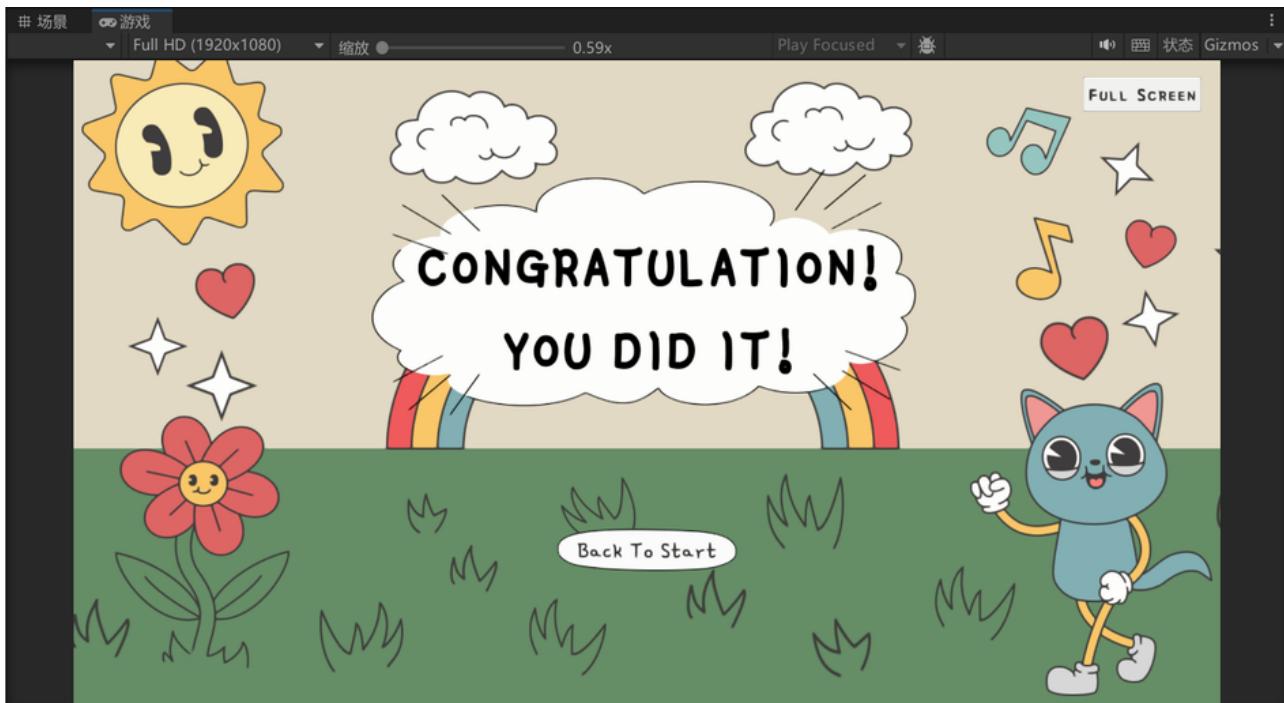
Play Ground



Mode Choose Page



Actual Playing Page



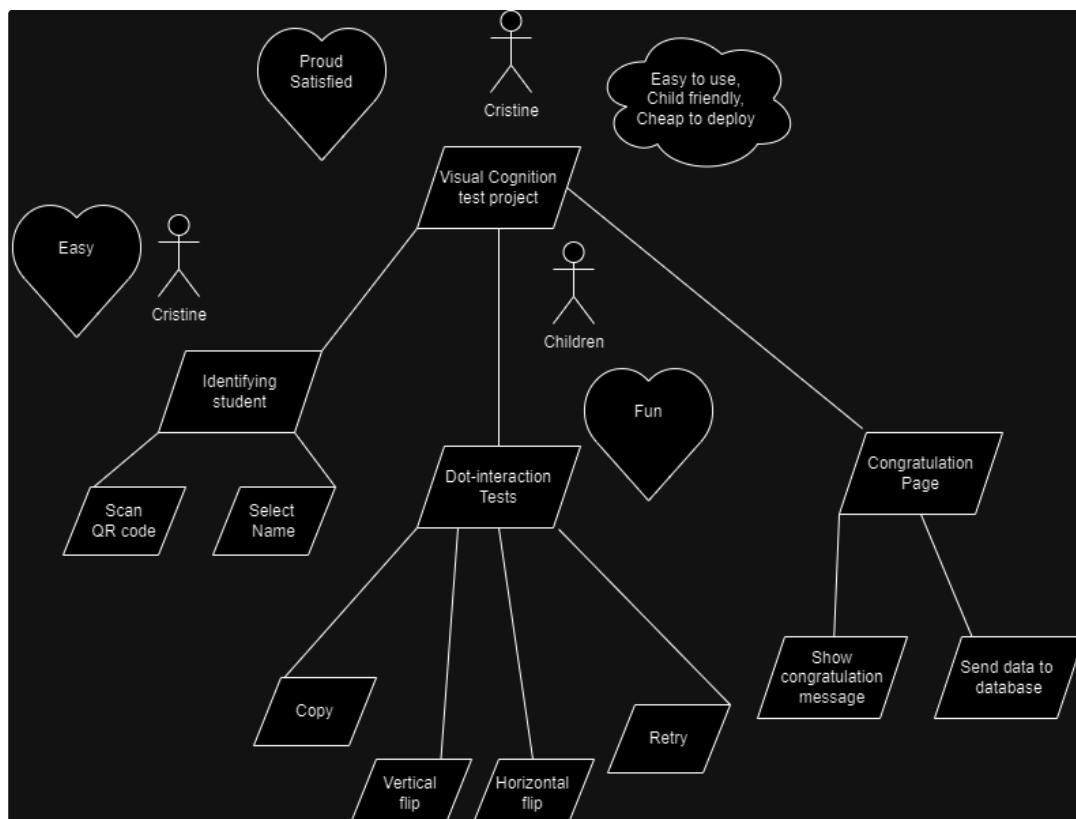
Result Page

Date	Update History
14/08/2023	<ul style="list-style-type: none"><li>• Plan version 1 UI outline</li><li>• A UI Design come from Raad</li></ul>

21/08/2023	<ul style="list-style-type: none"> <li>More UI Designs come from Raad and Daxuan Yue</li> </ul>
01/09/2023	<ul style="list-style-type: none"> <li>Update the old UI Designs to have a better looking</li> <li>Add more UI Designs come from Raad and Daxuan Yue</li> </ul>
18/09/2023	<ul style="list-style-type: none"> <li>Decide the final UI Designs and put all pages into document</li> <li>Delete the old versions of other UI Designs</li> </ul>
22/09/2023	<ul style="list-style-type: none"> <li>Organize the format of the document</li> <li>Some change come from Unity</li> </ul>
18/10/2023	<ul style="list-style-type: none"> <li>Add a page to let children decide the test mode</li> </ul>

## Motivational Model

Who	Do	Be	Feel
<ul style="list-style-type: none"> <li>• Children</li> </ul>	<ul style="list-style-type: none"> <li>• Enter tester info</li> <li>• Dot-pattern join test</li> <li>• original/vertical flipped/ horizontal flipped</li> </ul>	<ul style="list-style-type: none"> <li>• Extensible</li> <li>• Compared to tablets/ laptop</li> <li>• Anonymous</li> <li>• Easy to understand</li> <li>• Lightweight</li> </ul>	<ul style="list-style-type: none"> <li>• Fun</li> <li>• Encouraging</li> </ul>
<ul style="list-style-type: none"> <li>• Teacher (Admin)</li> </ul>	<ul style="list-style-type: none"> <li>• Verbal Instruction</li> <li>• Update Task</li> <li>• Send result to other end</li> <li>• Retry if they failed once during each step</li> </ul>		



Date	Update History
14/08/2023	<ul style="list-style-type: none"> <li>• Add Motivational Model</li> </ul>
01/09/2023	<ul style="list-style-type: none"> <li>• Update Motivational Model</li> </ul>
22/09/2023	<ul style="list-style-type: none"> <li>• Create a table to analysis motivational model</li> </ul>

## Code Standard

Language: C#

### Variables Naming Standard ☺

- **Little hump nomenclature**, which starts from lower case word and follows with upper case first

```
1 String name = "Bob";
2 int countNumber = 8;
3 bool isMax = false;
```

- The length of the naming should not be too long, okay to use some abbreviations

```
1 // Don't do this!
2 int lengthOfDocument....;
3
4 // Okay to do this
5 int lenghtDoc;
```

- **DO NOT** abbreviate the words that are hard to understand! If you do, please put a comment above it to describe what it is.

```
1 // Don't do this!
2 int titv;
3 // Means this is the variable
```

- The temporary variable should be as simple as possible, but it is easy to let people know their meaning

```
1 int i = 0;
2 String s = "hello";
3 int count = 0;
4
5 // Such as this circumstance
6 int a = 0;
7 while (...){
8     a += 1;
9 }
10 Debug.Log(a);
```

### Function & Class & Namespace Naming Standard ☺

- **Upper hump nomenclature**, start from the upper case word and follow with the upper case first

```
1 void ThisIsTheFunction(){};
```

- **DO NOT include an abbreviation in the function name as possible as you can!**

- Enum should start from Upper letter E and follow with Upper hump nomenclature naming.

```
1 enum ESeason {Spring, Summer, Autumn, Winter};
```

- The interface should start from the Upper letter I and follow with the Upper hump nomenclature naming

```
1 interface IMyInterface{}
```

- The class should be in upper hump nomenclature naming

```
1 Class MyClass{}
```

- Struct should be in upper hump nomenclature naming

```
1 struct MyStruct{};
```

- The namespace should start from DOT and follows the direction in the Scripts folder

```
1 // The script is in directory: Asset/Scripts/Utilities/
2 namespace DOT.Utilities{...}
3
4 // The script is in directory: Assest/Scripts/Line/LineBehaviour/
5 namespace DOT.Line.LineBehaviour{...}
```

## Constants Naming Standard ↗

- Have to be complete upper size, words split by '\_'

```
1 const String CONSTANT_STRING = "constant string";
```

## Modularization Code ↗

- Put the different parts of codes that play different roles (where finish their task) into blocks by using empty lines to separate them apart

```
1 void Function1{
2     // code block one
3     ...
4
5     // code block two
6     ...
7 }
8
9 void Function2{
10    ...
11 }
```

## Comment Standard ↗

- Comments should be placed where needed.
- All Functions (other than getter, and setter), interface, class, and beginning of the script file, should have comments to summarize what is this part of the code doing.

```
1 // Description of MyClass ...
2 class MyClass{}
```

- The comment for utility functions should be detailed, here is the standard format

```
1 ///<summary>
2 /// ...
3 ///</summary>
4 ///<returns> ... </returns>
5 void Tool1{}
```

- The comment should be in double languages: Chinese and English

```
1 // This is the comment
2 // 这是注释
```

```
3 void MyFunction()
```

## Others ↗

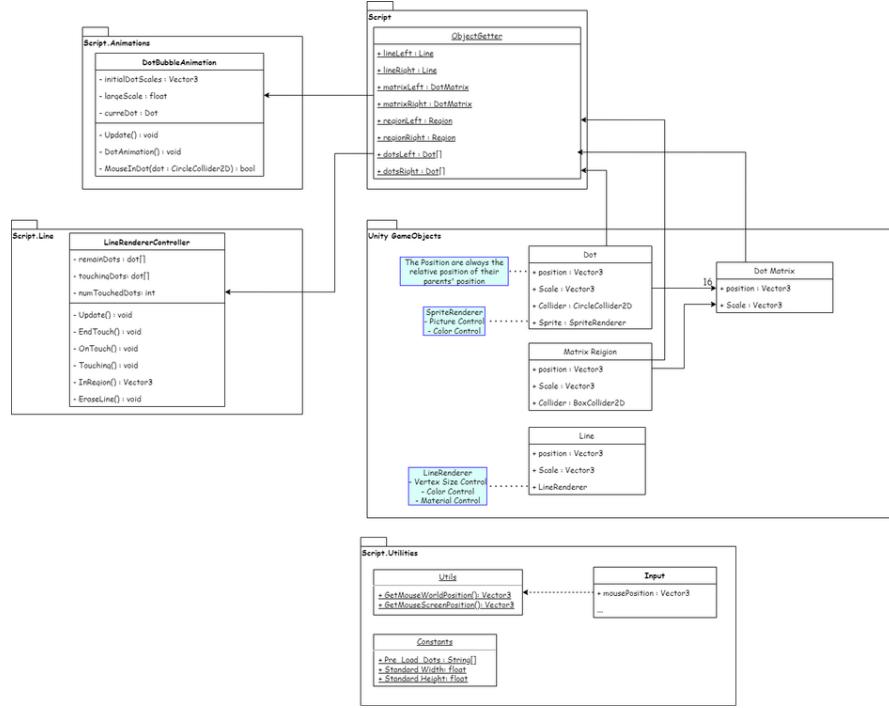
- All utils (tools) functions that will be used in different classes should be located in Utilities.

Date	Update History
14/08/2023	<ul style="list-style-type: none"><li>• Add Code Review</li></ul>

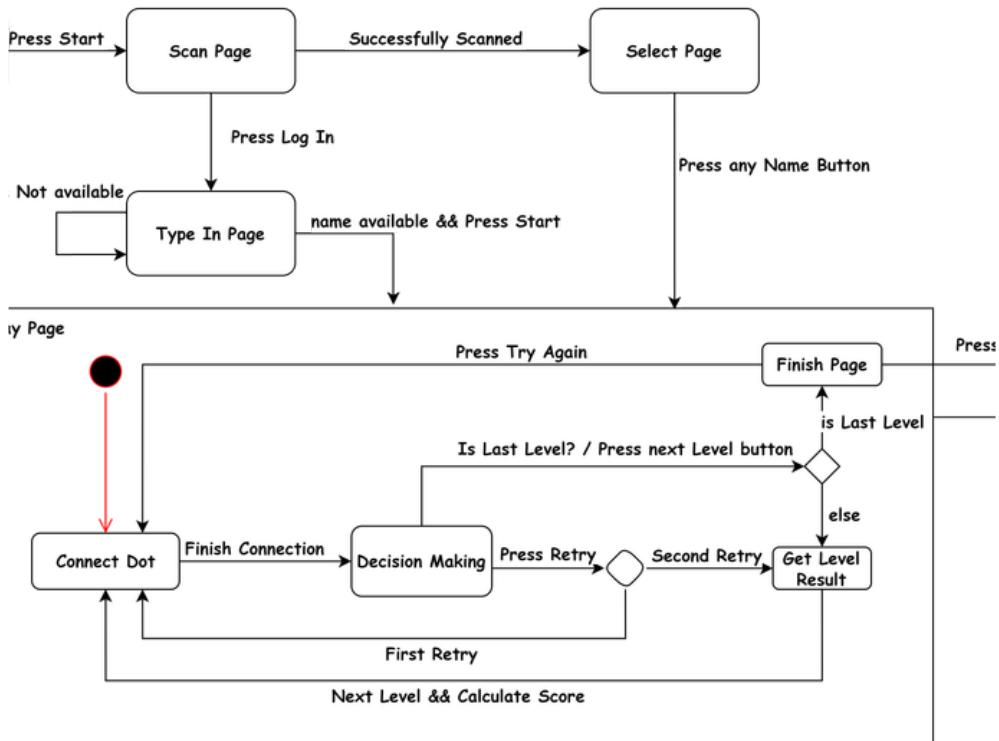
## ⚠️ Architectural Designs

The whole software development is done in Unity, which is basically a game development engine. So the Relation between each class (object) will not only be decided by the scripts but also be decided by the game objects in the game scene.

### Domain & Design Package Model 💡



### State Diagram of Game Processes



Date	Update History
01/09/2023	Change the title of the page
02/09/2023	Update the Domain & Design Package Model & State Diagram of Game Processes
02/09/2023	Add the notes of the page



## User Story

User	Action	Priority/Size
Children	be able to prepare by scanning a QR code and selecting their name from a list so the preparation part before the test is easy for them to do	high/high
Children	be able to do the copy, vertical flip, and horizontal flip test in a funny way	high/medium
Cristine	deploy the product on a server	high/medium
Children	be able to see how lines are connected before playing the game	medium/high
Children	be able to try the drawing before the actual test	medium/small
Children	have a chance to retry a test	medium/small
Children	proudly see the congratulatory message on the screen after finishing the test	medium/small
Cristine	the web app sends the data of children's id, score, and pass/fail back to the database after they finish their tests	medium/mediu m
Children	be able to listen to voice instructions and watch animation instructions	low/medium
Children	be able to click on the cat for voice instructions	low/medium
Children	be able to mute the audio when it is not needed	low/small
Children	be able to select the hardness of test	low/medium

Date	Update History
18/9/2023	Add a user story table
22/9/2023	Delete the previous User story out the table.

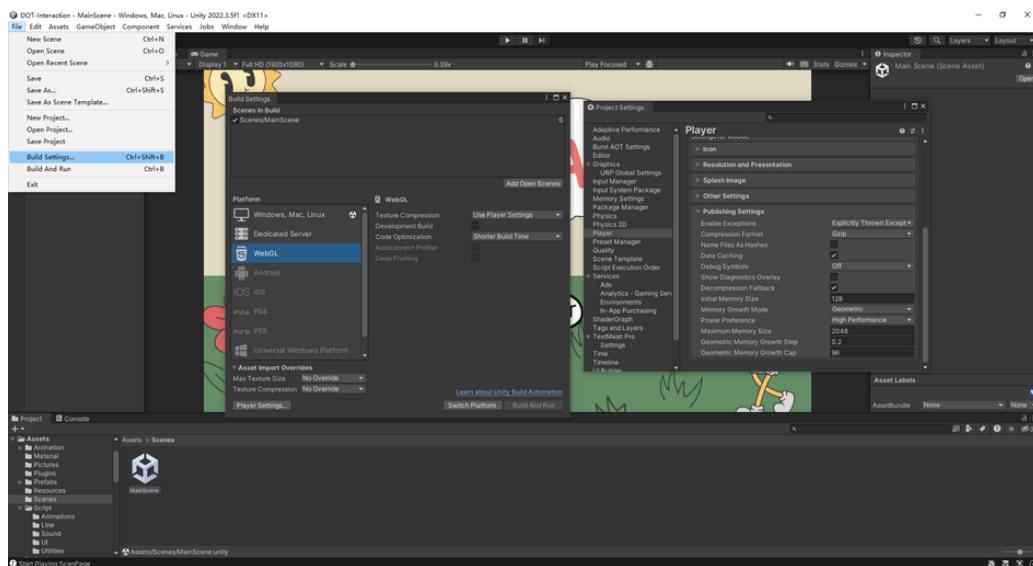
## ✓ Deployment

The public website for the project: <https://test.d1wbd8xyp2ly9d.amplifyapp.com>

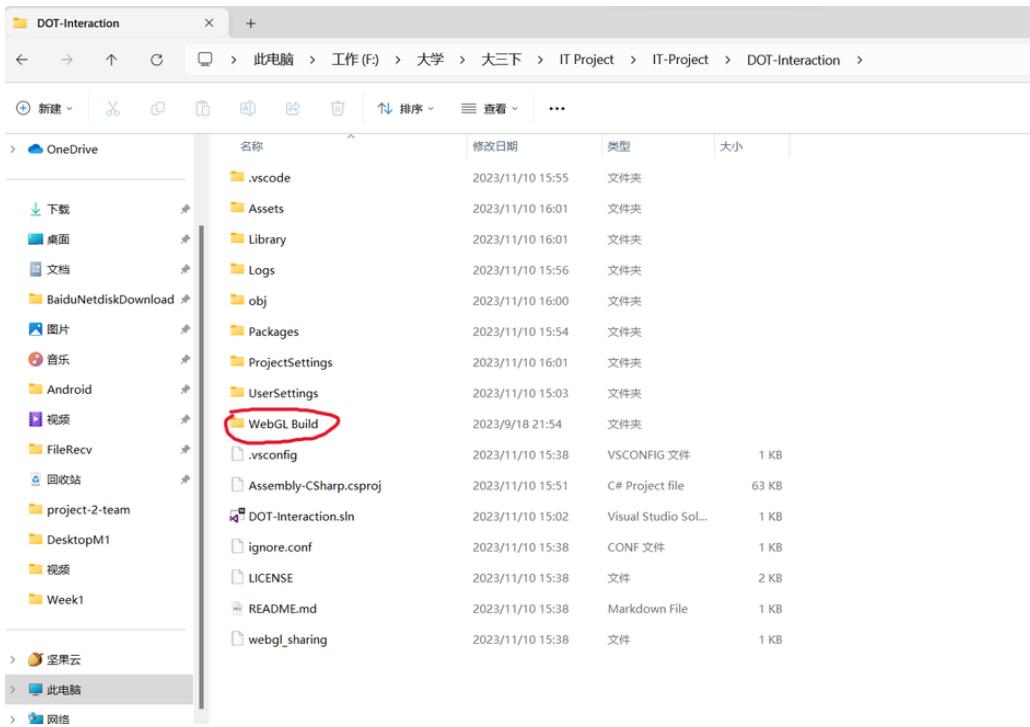
The product will be deployed through a cloud server, we choose to use the AWS(Amazon Web services) Amplify and upload the WebGL build file to the server. No FTP (file transfer protocol) platform is needed during this process as we can directly upload files to the AWS Amplify. It will be assigned to a URL so the users can access the test by entering the link. As this is a web app, it will be easy to cross different platforms.

GitHub repository: [GitHub - ClainChen/IT-Project](#)

This is a Unity project. You need to open the DOT-Interaction file inside the main repository with Unity editor version 2022.3.5f1(LTS) if want to make any changes to this program. We provide a WebGL build inside the (...) file. However, if you want to build the project again, select file->Build settings, and make sure you switch to the WebGL platform before build. The player settings are already set for you.



The WebGL build file is what you want to put in your cloud server.



Date	Update History
01/09/2023	Add the explanation of the page
15/09/2023	Add a link to the public website for the project
10/11/2023	Add the GitHub link to the code repository and introduction

## Testing

### Code tests:

1. Pass the compile test
2. Pass the git hub repository pull/push sequence
  - a. Make sure haven't merged the conflict
  - b. Make sure the repository is not enough
  - c. Make certain all branches are independent before syncing with the main repository
3. Test the execution order of the scripts, and make sure it is adaptable on all different computers (devices)

### Unity Test:

1. Test the UI self-adaption periodically
  - a. Decide the standard Window size to be 1920 \* 1080 HD
2. Test the line connection function, and make sure it works properly
3. Test the mouse's world position is always synced in the same coordinate system as the actual game objects (main camera)
4. Test the Intro animation and ensure it runs properly on each device
  - a. Delete the old animation: matrix appears in the middle of the screen and split into two different matrixes on two sides
  - b. Add a new animation: two matrixes pop out simultaneously.
5. Test the sound effects work properly
  - a. The sound plays when the mouse is in the bound of dots in the right matrix

### Test plans:

Test Case Type	Description	Test Step	Expected Result	Status	Improvement & Change
Functionality	Line connection should work without bugs.	Run mock test with children, adults.	Line connection will function correctly with any unexpected actions.	Pass or Fail	No bug happens after more than 20 times tests.
Usability	Ensure all buttons and process works in order.	Randomly click on buttons in website.	Buttons take users to the next step following the process.	Pass or Fail	They works pretty good without bugs.
Usability	Server will run properly	Enter in the website	The website will not report any error	Pass or Fail / Log Exception Report	The web will not report error, but we are not sure it will fitful for all Web Browser.
Usability	QR Code Scanning is run properly	Scan the QR Code	The QR Code will be correctly identified	Pass/ No Reaction/ Wrong identified	QR Code Scanning is now run properly, but due to the specialist of Unity Engine, the performance /

					respond will not pretty high.
Functionally	Line Simulation Animation Run properly	Getting into play page and press test button	The line will automatically simulation with the correct pattern	Run Properly or have some unexpected error	Test with button and bug testing, it do not have any bugs now.
Functionally	Able to draw the line properly in matrix	Getting into Try Page and start Play, Getting into Play Page and Start Play	line will run properly without unexpected error	Run Properly/ Line will stick on screen/ Unable to connection with dots	Line interaction works smoothly right now.
Usability	User have a chance to retry a test	Getting into Play Page and draw a pattern. Check whether able to retry	The Retry button will pop out and work properly	Pass/ Button do not com out/ Button do not run properly	They now able to retry a test, but with 1 score down.
Functionally	The play process is run properly	Getting into Play page and play by them self	No error, the title is change properly, the animation is run correctly	No error/ unexpected exception/ Error/ Crash	We do not receive any problem when testing the play process or testing by ourself, so we assume this is working fine.
Functionally	The Voice Guide is Run Properly	Experience the whole game and check the voice is run properly	The require voice is run at the proper place correctly. The Voice do not have overlap issue	Run Properly/ unexpected exception/ Error/ Voice run overlap another.	Change some of Voice Guides and Cat Voices. Rearrange the voice order, now should works fine.

### User test:

We decided to use a survey method to test our product. Some key questions such as bugs encountered during the test, whether is it easy to draw lines, is there any confusions during the test and ask them for recommendations. We also noticed that the time required to complete the survey should not be too long, so people are more likely to finish the test and less likely to give random answers.

The link for the form:

[!\[\]\(133e5144baf9c90220b67ca9e7f162e0\_img.jpg\) Vis-Cat test feedback](#)

## Test result:

2023/11/10 15:41

Vis-Cat test feedback

### Vis-Cat test feedback

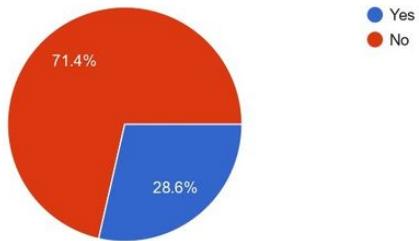
7 responses

[Publish analytics](#)

Did you encounter any bugs during the test?

 Copy

7 responses



If you encounter any bugs, please describe it. Otherwise leave this blank.

2 responses

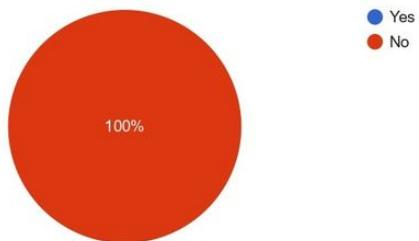
cant see properly

我连漏了最后一个点，但是还是说我过了

Did you feel lagging(kale) during the test?

 Copy

7 responses



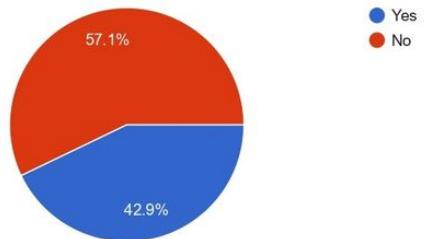
<https://docs.google.com/forms/d/15mZATH86HW42V2L2gl3Dzz4bPwR0Tl5iPyRodKWJMM/viewanalytics>

1/4

Did you have any problem with the QR code scanning?

 Copy

7 responses



If you had any problem with the QR code scanning, please describe it. Otherwise leave this blank.

3 responses

The place that's supposed to be the QR code is a blank square for me.

can switch the camera

I can't scan it

Do you feel it is easy to draw the lines?

 Copy

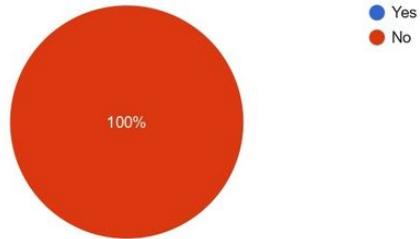
7 responses



Do you still have confusions after listening to the voice guide and watching the demonstration video about the test?

 Copy

7 responses



Please give us any suggestion you have about the test.

7 responses

it would be nice if there is one or two sentence describing the essence of the task instead of pure voice descriptions, as voice descriptions demand constant high attention and participants can easily miss some important details.

good

Good I love Fang Ge 

good job

The quality of images could be improved

very good

Scenes can have more animations to improve the interact experience.

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Google Forms



<https://docs.google.com/forms/d/15mZATH86HW42V2L2gI3Dzz4bPwR0Tl5lPvRodKWJMM/viewanalytics>

3/4

### Improvement based on test results:

1. Add animation to the cat and sun to have more fun
2. Fix bugs that occur when drawing the line

Date	Update History
01/09/2023	Add unity, code test, and test plan
22/09/2023	Add a table to show the test plan

18/10/2023	Add the user test and link
10/11/2023	Add test result
11/11/2023	Add the result of each test plans

# 🎵 Sound effects & AI Voice generator

The Cats sounds

[🎵 Lets have some fun.mp3](#) [🎵 You found me again.mp3](#) [🎵 Remeber curiosity is the cat's best friend.mp3](#) [🎵 You are the best player ever.mp3](#) [🎵 whats over there.mp3](#)

Choosing the Easy mode and Hard mode:

[🎵 Choosing Test.mp3](#)

Reminder of the rules of Game

[🎵 Reminder Finger.mp3](#)

Sound effects:

[🎵 bubbles-14830.mp3](#)

[🎵 uiclick2-79817.mp3](#)

[🎵 level-passed-142971.mp3](#)

[🎵 toy-button-105724.mp3](#)

[🎵 interface-1-126517.mp3](#)

[🎵 fantasy\\_ui\\_button\\_6-102219.mp3](#)

[🎵 pick-92276.mp3](#)

[🎵 pop-up-something-160353.mp3](#)

[🎵 stop-13692.mp3](#)

[🎵 shooting-sound-fx-159024.mp3](#)

AI Voice Generator

[🔗 English Text-to-speech software | Ondoku](#)

Free bubble sound effects and other kinds of sound effects.

[⚠️ Free Bubble Sound Effects Download - Pixabay](#)

Background music

[⚠️ Best SFX \(Sound Effects\) Catalog to Download | Artlist](#)

Date	Update History
21/08/2023	Add bubble sound and background music choices
22/09/2023	Add specific sound effect file
18/10/2023	Add every sound effect file with labels and organized format of page.

## Dialogue - VOICE GUIDING

### In StartPage Play :

"Welcome to our exciting pattern-matching game Click Button to get started!"

### In ScanPage :

"Please scan the QR code to get your name."

### In SelectPage play :

"Please select your name by pressing the name button. If you cannot find your name here, you may click the "I can't find my name" button, and you can input your name by yourself!"

### In TypeInPage play :

"Please Type In your name, School, and other details information ..."

### In MenuPage play :

"Now, we are going to start the game! Are you ready? You can press "I want to try first" to get into the playground so you can freely draw the line by yourself!"

### In PlayPage play ( in Stage1 ) :

It's time for a fun pattern-matching test. You'll see a set of

dots on your paper, and your job is to draw lines to connect the dots in the correct order to match the pattern shown. Take your time, and if you make a mistake, don't worry – just try again. But you only have one more chance. Good luck!

### Enter Stage1 play :

...Repeat the pattern shown on the left.

### Enter Stage2 play :

Great job! Now, we're taking our pattern-matching test to the next level. In stage 2, the pattern you see will have undergone a vertical flip. It means that if there was a dot on the left side in the original pattern, it would now be on the right side, and vice versa.

...

### When in Stage2 play :

... Repeat the vertical flip pattern

...

**In stage 3 play:**

We're now moving on to the third stage of our test. In this stage, the pattern you see will be a horizontal flip of the pattern you encountered in stage 1. This means that dots that were at the top in the original pattern will now be at the bottom, and dots at the bottom will be at the top. This is the final stage.

**Enter stage 3 we play:**

Repeat the horizontal flip pattern

**Finish the test play:**

Congratulations! You have done all the test!

Date	Update History
22/09/2023	Add dialog content of each stage.

---

## Sprint Planning

### Sprint1:

What	How	Who	Input	Output
Determine the development software & tools	Try several apps and decide it at last	All team members	Unity, Godot, html & js & css, flash...	We decided to use Unity
Develop the dot game part of the program (without proper UI)	Create a fundamental game part with basic functions in Unity	Clain Chen	<ul style="list-style-type: none"> <li>• Matrix</li> <li>• Dots assets</li> <li>• Line Render</li> <li>• Pattern Matching</li> </ul>	Finish the first demo of the line interaction and make sure the function does not have bugs
Decide the UI style and design the first UI Prototype	Decide the development tool and design several UI Patterns to make the decision	Marco Yue & Raad	<ul style="list-style-type: none"> <li>• Use Figma</li> <li>• Figma Asset Store</li> <li>• Design Style: Cartoon / Brief / Classic ...</li> </ul>	Come out with four different styles and successfully make the decision. The final decision is Cartoon
Decide the sound effects needed and find them online	Find a proper website or software to generate such voices. And possibly use music composition software to compose music.	Tom Fang	<ul style="list-style-type: none"> <li>• Voice Documents</li> <li>• Web site decision</li> <li>• Voice Pattern</li> </ul>	Find the website, still making the voice documentations, the Voice Guide part decide to complete in Sprint2
Deploy the project onto the website	Find a proper website to deploy to.	Clain Chen Steve Chen	/	Decide to use the AWS server and successfully deploy into it
Confirm the data needs and function needs of the Customer	Frequently contact customer and backend teams to gather information	Steve Chen	/	Decide the data needs: Name, ID, School, Score...

### Sprint2:

What	How	Who	Input	Output
Fully implement the UI interactions and UI Design into Unity	Contact with UI Designer and decide the final UI Pattern. Complete all the UIs in Unity	Clain Chen Marco Yue & Raad	The exact UI Pattern	Set up the UI design in Unity and make sure they do not run around

Add the gameplay logic	Program in Unity and make sure the testing and review do not have any bugs	Clain Chen	The current project developments	<ul style="list-style-type: none"> <li>• Finish the logic</li> <li>• Title change</li> <li>• The user can only reset once</li> <li>• Post the test to the website</li> </ul>
Add some animation to the UI	Program in Unity and make sure the testing and review do not have any bugs. Contact with UI Designer to make sure the animation is proper	Clain Chen Marco Yue & Raad	<ul style="list-style-type: none"> <li>• Use Adobe Effect to create an animation prototype</li> </ul>	Finish making the line simulation animation
Add a QR Code Scanning function to the game	Find a plugin from the website to support the QR Code scanning function and further develop it in Unity	Clain Chen Steve Chen	<ul style="list-style-type: none"> <li>• Use ZXing Library from GitHub</li> </ul>	Finish implementing the QR Code Scanning part.
Add Voice Guiding	Decide the voice-guiding documents and convert them into a voice. Realize the Voice into Unity	Clain Chen Tom Fang	<ul style="list-style-type: none"> <li>• Use Ondoku website</li> </ul>	Finish creating the vocal guiding and implement it into Unity.
Deployment Testing	Enter the Server website and do the test	All Member	/	Eliminate all known bugs and make sure the workflow is correct. GitHub does not have any merge conflicts.

### Sprint3: ↗

What	How	Who	Input	Output
Keep maintaining the project Testing and Website	Decide the test plan and keep testing	All Member	<ul style="list-style-type: none"> <li>• The functions of the project have been finished</li> </ul>	The website is working fine, it do not have lagging when entering website.
Improve the product based on testing result	Divide the test to each member and find their friends to keep testing	All Member	<ul style="list-style-type: none"> <li>• Test feedback</li> </ul>	We add a level choosing page, more animation, advance ai voice guide.
Implement the API Issues	Communicate with backend teams and	Steve Chen	<ul style="list-style-type: none"> <li>• The API come from backend</li> </ul>	Able to transfer the data to backend

		decide on the API			fluently.
Implement further animation	Complete the animation in Unity after testing in adobe effect	Clain Chen Marco Yue & Raad	• The animation plans come from UI	Cat is able to waving its hands and Sun will be able to shine.	
Security Consideration	QR Code Implementation, HTTPS Implementation	Clain Chen	• QR Code and False QR Code, HTTPS Usage	False QR Code will lead to empty button selection now. User will be unable to continue to next page	



Date	Update History
11/09/2023	Add sprint planning page
15/09/2023	Add all of the sprint plan
22/09/2023	Add timeline of the sprints and specify the sprint plan with table.
11/11/2023	Add more timeline of sprints and for final product.



## Sprint Retrospectives

## Sprint1 Retrospective 22/09/2023

What went well? 🎉	What went less well? 😞	What do we want to try next? 🧠💡	What puzzles us? 🧩
Completed a demo	Client was not that interested in the initial design	Make a design that suits the client	How students data should be presented?
Experimented with the different UI designs and had some initial layouts	The documentations on confluence are less complete	Working more on confluence and making sure everything is documented	How communication works with the backend team?
Clarified with clients their needs and adjust to new requirements as soon as possible	The branches in GitHub are less organised	Focusing more on adhering to the agile methodologies and making it a priority in our work	
	Not following agile methodologies properly		

 Sprint2 Retrospective 22/09/2023

<b>?What went well? 🎉</b>	<b>What went less well? 😞</b>	<b>What do we want to try next? 🧠💡</b>	<b>What puzzles us? 🧩</b>
Completed the process of scanning a QR code	Communication with backend teams is not effective enough	Design the animation for some components in the UI design (Cat, Sun, and Flower)	How the interactive animations should be done?
Completed all the necessary logic behind the gameplay	Have not finished the animation	Implement more interactive elements for the UI	What tools should be used to make the animations?
Implemented an instructor that uses an AI voice generator to guide the children	The voice guide is less interesting	Find a more suitable generated voice for our needs	What are the port numbers and IPs for backend teams?
Added icons and buttons in the UI design.			
Deployed the website in AWS			

## ⌚ Sprint3 Retrospective 18/10/2023

What went well? 🎉	What went less well? 😞	What do we want to try next? 🧐	What puzzles us? 🤔
Test the system and conduct a survey collecting feedback.	Communication with back end.		API implementation
API implementation			Animation implementation
Complete animation of the system.			Making test plan and handout test and survey.

## Communication with client

Throughout: Zoom, Emails, In person

### Zoom:

18/08: See [Meeting 18/08](#)

21/08:

Action	Result
Show the client our different UI design styles and let her choose one	The cartoon style was chosen
Ask her what data is required to send to backend	The children's name, age and score is required to send to backend.
Ask her if we need a background music	She hasn't decided this yet
Ask her if she wants to deploy this product on a server	She hasn't decided this yet

After this meeting, we are more clear about the client's needs and ready for further development.

04/09:

Action	Result
Show her the demo we get after sprint 1	She was pleased for our demo
Ask her if we need a background music	She said we do not need that
Ask her if we need some instruction animation	She said it depends on us (We decide the voice instruction itself is enough)

After this meeting, we decided what tasks needed to be done during sprint 2 based on the client's feedback about our sprint 1 demo and her most up-to-date needs.

### In-person:

31/07:

Action	Result
Listen to the client talking about the background story as well as her needs about this project	Get a basic idea of what to do during this project.
Ask her about developing this project as a website instead of a mobile app	She agrees that a website makes more sense
Ask her about the details of that vis-cat game such as the scoring mechanics and how three different stages of the game swap between each other.	She clarifies the details of the game to us

We have a basic idea of what this project will be about and what kind of product we need to develop.

18/09:

Action	Result
Show her the website we got so far	She is pleased with most of it, but wants the page to be arranged in a way that fits iPads better
Ask her if she wants a voice guide	She wants the voice guide
Ask her what animations she wants	She only wants some small animations that won't interrupt the children's attention.

Find some bugs to fix and know we need to rearrange the website to make it fit iPads more.

### Emails:



STEVE CHEN &lt;yuxuchen5@student.unimelb.edu.au&gt;

**Some questions for the visual cognition test's mobile app**

7 messages

STEVE CHEN &lt;yuxuchen5@student.unimelb.edu.au&gt;

To: nearchou@unimelb.edu.au

Fri, Aug 11, 2023 at 7:37 PM

Hello Cristine,

I am Steve Chen, the project owner of one of the teams that is doing the visual cognition test's mobile app. Just want to confirm with you about some of the questions.

1. From our last meeting, we talked about the choice between the mobile app and web app and got a common view that web app is more suitable for your needs. Based on this, our team has already get a very rough demo, but before any further development, we want to get confirmation that will the web app be the final decision?

2. Another question is about retrying the test. After the user click the retry button, do they start from the first test or do they redo the current test?

3. One last thing is about the server, if you want to collect and restore data or want people to be able to access the test through a link, I believe a server is necessary. Have you talked with your team and gotten a decision? My suggestion is just to rent a cloud server.

Best regard,  
Steve Chen

Christine Nearchou &lt;nearchou@unimelb.edu.au&gt;

Fri, Aug 11, 2023 at 7:47 PM

Hi Steve

Thanks for the email and your questions – please see below my responses in red.

Please let me know if I can assist any further or if any other questions. Very happy to help in any way possible.

Regards

Christine

**From:** STEVE CHEN <yuxuchen5@student.unimelb.edu.au>  
**Date:** Friday, 11 August 2023 at 7:37 pm  
**To:** Christine Nearchou <nearchou@unimelb.edu.au>  
**Subject:** Some questions for the visual cognition test's mobile app

Hello Cristine,

I am Steve Chen, the project owner of one of the teams that is doing the visual cognition test's mobile app. Just want to confirm with you about some of the questions.

<https://mail.google.com/mail/u/0/?k=710d00d721&view=p&search=all&pemthid=thread-a:r6544772503182055156&mpl=msg-a:r65464249863...> 1/3

Not sure if I replied already but perhaps, we go with Friday afternoon – will need to be 330 pm via zoom.

If this is good for your team send me a calendar invite and zoom link.

[Quoted text hidden]

STEVE CHEN &lt;yuxuchen5@student.unimelb.edu.au&gt;

Wed, Aug 16, 2023 at 8:29 PM

To: Christine Nearchou &lt;nearchou@unimelb.edu.au&gt;

Sure, It works for most of our members.

Here is the zoom link:  
<https://unimelb.zoom.us/j/9956987850?pwd=Y2FqM0ExZ3VNViVwdHZcHlCMVJ6UT09>

Meeting: 995 698 7850  
 Password: 757225

And sorry I don't really know how to invite with calendar, but I think you can just join the zoom meeting using the link above on Friday.

So see you at 3:30 Friday. 😊

[Quoted text hidden]

1. From our last meeting, we talked about the choice between the mobile app and web app and got a common view that web app is more suitable for your needs. Based on this, our team has already get a very rough demo, but before any further development, we want to get confirmation that will the web app be the final decision? I think the web app makes more sense to me and hope it makes it more versatile to suit a variety of devices.

2. Another question is about retrying the test. After the user click the retry button, do they start from the first test or do they redo the current test? No they retry the part they are up to (copy, flip etc)

3. One last thing is about the server, if you want to collect and restore data or want people to be able to access the test through a link, I believe a server is necessary. Have you talked with your team and gotten a decision? My suggestion is just to rent a cloud server. Can we just allow it to be accessible by me alone and therefore be stored on my laptop?

Best regard,

Steve Chen

STEVE CHEN <yuxuchen5@student.unimelb.edu.au>  
 To: Christine Nearchou <nearchou@unimelb.edu.au>

Tue, Aug 15, 2023 at 9:53 PM

Hi Cristine,

For the server question above, surely we can do that. But we have questions about some details and want to show you our demo and UI design. Do you have time this Sunday at 1pm to have a zoom meeting with us?

Thanks and regards,  
 Steve  
 [Quoted text hidden]

Christine Nearchou <nearchou@unimelb.edu.au>  
 To: STEVE CHEN <yuxuchen5@student.unimelb.edu.au>

Tue, Aug 15, 2023 at 10:01 PM

It's open day @UOM  
 I am volunteering on Sunday - sorry  
 Can you suggest another time?

Sent from my iPhone

On 15 Aug 2023, at 9:53 pm, STEVE CHEN <yuxuchen5@student.unimelb.edu.au> wrote:

[Quoted text hidden]

STEVE CHEN <yuxuchen5@student.unimelb.edu.au>  
 To: Christine Nearchou <nearchou@unimelb.edu.au>

Tue, Aug 15, 2023 at 10:14 PM

Is totally fine. Do you prefer Friday or Saturday afternoon?  
 [Quoted text hidden]

Christine Nearchou <nearchou@unimelb.edu.au>  
 To: STEVE CHEN <yuxuchen5@student.unimelb.edu.au>

Wed, Aug 16, 2023 at 6:03 PM

<https://mail.google.com/mail/u/0/?k=70e09d721&view=p&search=all&pemthid=thread-a:r6544772503182055156&mpl=msg-a:r65464249863...> 2/3

A small question about vis-cat - yuxuchen5@student.unimelb.edu.au - The University of Melbourne Mail

Compose

Inbox 3399

Starred Snoozed

Sent Drafts

More

Labels

Steve Chen <yuxuchen5@student.unimelb.edu.au> to Christine Nearchou <nearchou@unimelb.edu.au>

Hello Cristine,

Just wondering, should we let the children do all three tests whether or not they did the previous one correctly? Or should finish all the tests is a more reasonable approach as the other approach makes some children fail the test at an early stage.

Best regards,  
 Steve Chen

Christine Nearchou <nearchou@unimelb.edu.au> to me

Hi Steve

The reason for not completing other levels is that they are not cognitively ready and will only make them feel a sense of failure. I understand your thinking but it will serve no purpose.

Hope that makes sense  
 Christine

Sent from my iPhone

> On 18 Sep 2023, at 10:38 pm, STEVE CHEN <yuxuchen5@student.unimelb.edu.au> wrote:  
 >

STEVE CHEN <yuxuchen5@student.unimelb.edu.au> to Christine Nearchou <nearchou@unimelb.edu.au>

Hi Christine,

Sure, this makes sense. We will follow this approach.

Sorry to send you message that late,  
 Steve Chen

Date	Update History
22/09/2023	Add this page to confluence

 Team Decision Making

Decision	Proposer	Opinion from team members	OutCome
Developing Engine	Cheng Chen	Find various developing engine and compare them	Choose Unity
Assign role and jobs	Daxuan Yue	Based on everyone's skills and preference, choose the role and jobs for each one	Decide team structure
Deside the meeting time	Steve Chen	Everyone list the free time and choose a time that is suitable for everyone	Choose to meet every Sunday and if there are any issues, meet on Friday.
UI style design	Raad Althubaiti and Daxuan Yue	UI designers create multiple UI design with different and show other members as well as the client to choose the most suitable one.	The Cartoon style UI is chosen.
API design	Steve Chen	Choose a representative to communicate with other teams' representative and the client.	Choose to let Steve as the representative as he is the project owner and has talked with the client the most.
Bottom design	Steve Chen	Get different styles of bottoms and try to find the most suitable one for us	Decides to still use the old style but make the bottom bigger
Voice guide	JiaXing Fang	What voice we need to use and what instructions need to be given in different stages	Choose to use an AI voice generator that is free and easy to use

Date	Update History
22/09/2023	Add this page to the confluence

## 👋 Game Overview: Vis-CAT

### Core Concept: 🎨

This game use to test children's visual cognition and space imagination ability. Children need to copy the actual or some changing line pattern to show their abilities.

### Genre: 🎨

The App should be a simple line connection application, which included the test stage and the stage that play need to play the game to test their ability. This game do not want to give children any pression and hope to let children feel enjoy when they doing the test.

### Target Audience: 🎨

The students between 5 - 12 years old, and needs teacher to play with them.

### Progress 🎨

#### Control: 🎨

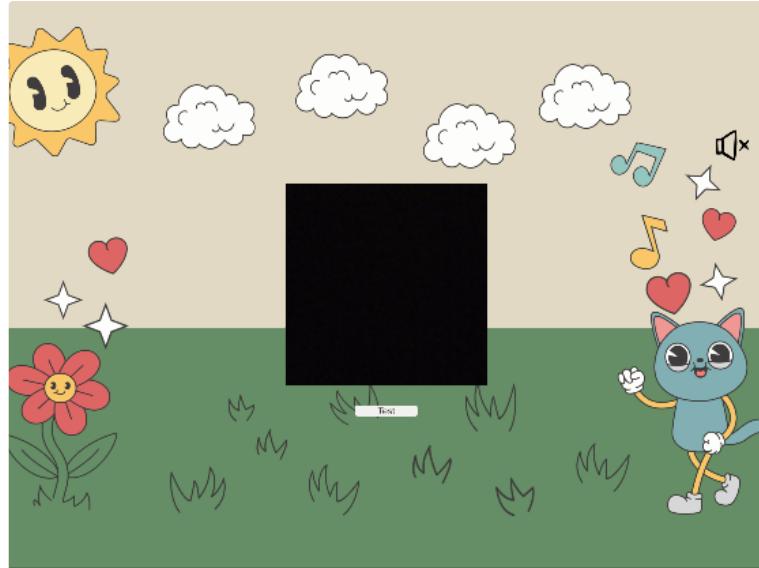
The game is facing to Tablet users, so basically using the touch-screen pattern, but also designed to able to run in computer by using mouse.

#### Pages: 🎨

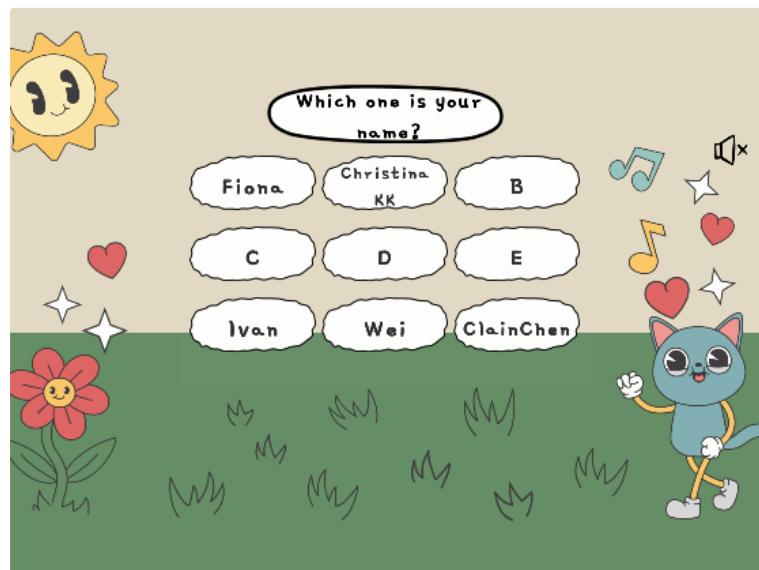
Start page:



QR code scan page:



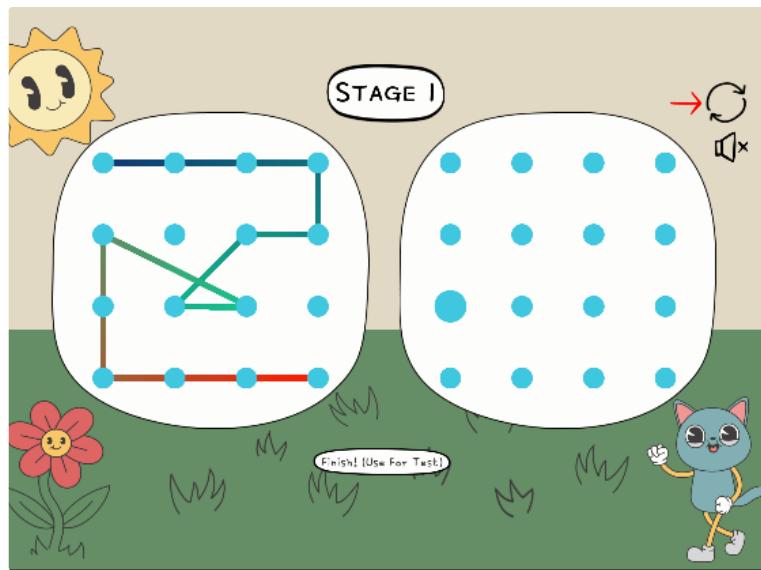
Name selection page:



Menu page:



Game page:



Finish page:



## Gameplay Mechanics:

This will be a 2D flat plane game just like a normal browser, which run like Kahoot. This app will fulfill the following functions:

- Player is able to interact with the buttons and buttons are able to do their works
- Player is able to play freely in Try Stage.
- Player is able to experience the normal gaming process in Play Stage
- Player has only one retry chance in each level
- Player will directly finish the game after they fulfill the condition
- Player are able to do the interaction with vis-cat
- The APP is able to scan the QR Code and receive the data in QR Code
- The APP is able to send the final result of player to the backend

## Game Design

### Art and Audio:

#### Art Style:

Responsible by Raad and Marco

The art style should be fully cartoon, and create a atmosphere with please and funny. The element in background should be simple to avoid distract children's attention. The game will include some easy animations, such as the cat is able to wave it's arm, the sun is able to rotate, and the cloud can move around, etc.

#### Sound & Music:

Responsible by Tom

As customer's requirement, the game do not have background music, but still has the sound effect when play connecting lines.

#### Assets:

To mask the game as simple as possible, we will make the background of game to pure color with different level, and add more elements gradually. We found dialog box, cloud, sun, cat, music score, stars, etc. Some simple icons, use for setting and page changes. All assets and fonts are found in the free website, and input them in Unity for further creation.

The animation will entirely made in Unity, which using Unity's Animator and Animation Controller Components.

### User Interface (UI):

The UI was quite brief, the button is round side with white background, and the dot matrixes are using the default material in Unity.

#### References:

UI:

 [Retro cartoon animation | Figma Community](#)

 [Doodle icons | Figma Community](#)

 [Comics in Figma | Figma Community](#)

Fonts:

 [Gamja Flower - Google Fonts](#)

AI Voice:

 [English Text-to-speech software | Ondoku](#)

### Technology and Tools:

Development Software : Unity

UI Design Software : Figma

Animation Design: Adobe Effect

AI Voice Creator:  [English Text-to-speech software | Ondoku](#)

Sound: StudioOne5

### Team Communication, Timelines and Task Assignment:

Scrum Master: Clain Chen

Project Owner: Steve Chen

Programmer & Animation Creator: Clain Chen

API Implementation: Steve Chen

UI Design In Figma & Animation Design: Raad, Marco Yue

UX Design: Tom Fang

Date	Update History
10/10/2023	Add this page to the confluence
10/11/2023	Update this page to match the most recent readme file in GitHub

## Delivery

The product is delivered to the client in two ways. The link to the GitHub repository will be sent to our client along with a zip file that contains everything in the main branch of the GitHub repository through email. All code contains comments to help the client's technique team understand the code. The readme file contains a brief introduction to this program as well as how to open, change, and build it.