

# Factors affecting user experience of Cloud Game Platforms (CGPs) on Phone/PC/TV and how to balance the factors.

## Abstract

This dissertation is aimed at the cloud gaming platform (CGP), through **competitive product analysis, user test, and questionnaires** to obtain and sort out the functions of CGP on different devices.

The dissertation involves the theory of questionnaires used to evaluate the game experience (PX), the theory of evaluating the functions of digital products across devices, and the theory of **functions evaluation** based on focus groups. Including Concur Task Trees (CTT), Abstract User Interface Level (AUIL), etc.

Through a **questionnaire survey** based on the Game Engagement Question (GEnQ) theory, I evaluated the possible usage scenarios, user characteristics and needs of CGP.

Through **expert interviews and competitive product usability testing**, I analyzed the IA and functions of the existing CGP products (demo).

Through two controlled **focus group** discussions, I evaluated and ranked the results and user needs I found before.

The final outcome is a **list of functions for CGPs** used on different devices, including function levels, function details and related systems.

## Introduction & Background

Cloud gaming platform (CGP) is a kind of products based on high-speed network connection and cloud server technology. CGP is developing rapidly, and many companies have launched their own cloud gaming platforms, including Google, Amazon, etc. The market share of CGPs, the number of supported devices, and user reviews are all low.

After analysis, CGPs still have shortcomings, including the following:

- **Not all devices are supported** – Devices
- **Poor functional design for different devices** – Functions
- **Poor control and gaming experience** – Experience

### The state of art

Saleh. (2010). A Model Driven Engineering Design Approach for Developing Multi-Platform User Interfaces. WSEAS Transactions on Computers.

Kathrin M. (2011). Measuring the impact of game controllers on player experience in FPS games. 15th International Academic MindTrek Conference.

## Research Methodology

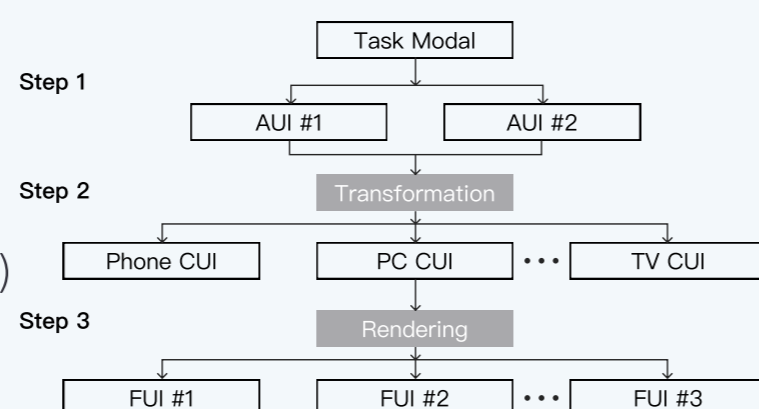
**Questionnaires; Expert review; Usability test; Focus group**  
Tools: Credamo; Maze; Zoom; Twitter

### Questionnaire

Goal: Collect user characteristics, usage scenarios, user needs, etc.  
Method: Game Engagement Questionnaire(GEnQ)

### Expert review & Usability test

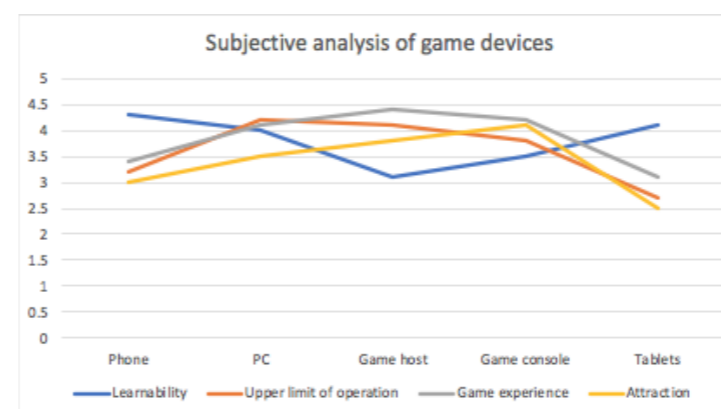
Goal: Analyze the IA of CGPs  
Method: Concur Task Trees(CTT)  
Abstract User Interface Level(AUIL)



### Focus group

Goal: Analyze the previous user needs list, scenario and device analysis  
Method: Based on the design research cases (MMUI)  
Comparison of the two groups; contextual CGPs assessment; functions analysis table (based on CTT)

## Research Results

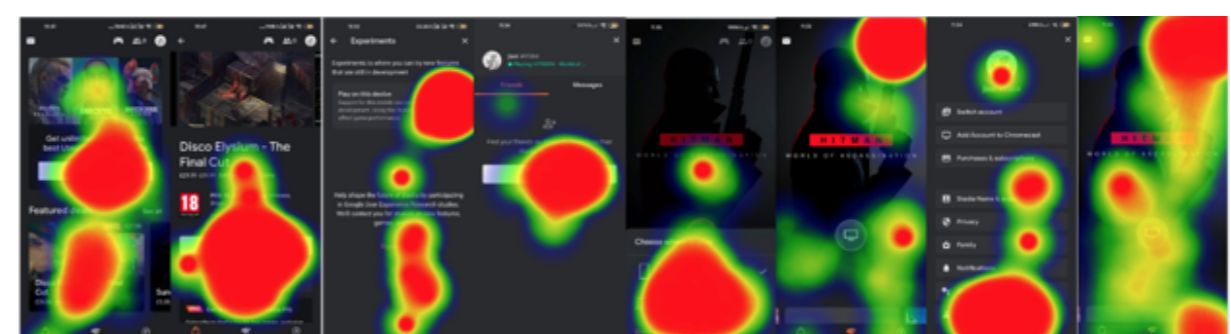


### Devices & Decision making

"Learnability" & "EA" are positively correlated ;  
"ULO" & "GE" are positively correlated ;But  
negative correlation between them

### Situations & Decision making

Social : " Audio and video experience and stability " and "Additional functions"  
Personal : "Operation" and "Game content"



### 5 Paths for Google Stadia Mobile Client

Browse the game details in the store and purchase it; Play the game you have played;  
Send a message in the game; Modify the controller on the mobile phone; Modify the display device of the game that selected

## Conclusions

Level	Requirements	Basic
0	Browse and buy/subscribe games	
0	Game content preview and introduction	
0	The settings of the game itself	
0	Cloud record (cross-platform payment, play)	
1	Game content trial	
1	Know the available devices and controllers	
1	Game quality settings (platform settings)	
1	Platform network and connection (platform setting)	
1	Social system outside the game	
1	Social system in the game	
1	Guidance and connection of controllers	
2	Switch between multiple devices	
3	Players' community (discussion and sharing)	
3	Friends play together	
3	Cloud computing and rendering power	

Level	Requirements	PC
1	Game interaction vs. CGP interaction	
1	Independent client and web browser version	
2	Guidance of the controllers (relation to hardware)	
2	Adapt to touchpad or other input device interaction	
3	Social and co-play system	
3	PC-customized existing game library	

Level	Requirements	Mobile
1	Mobile network connection detection and optimization	
1	Adaptive interactive interface of the game	
2	Virtual controller to control TV and PC	
3	Mobile streaming and live game content	
3	Special social system outside the game	

Level	Requirements	TV
0	TV controller connection and guidance(necessary)	
1	Network connection and testing(wireless or cable)	
1	Management of multiple controllers	
2	TV's special game content display method	
3	Simplified social system(adopt to TV controller)	
3	Use of sound equipment(highly customizable)	

Suggested functions lists  
As Guidelines for CGPs  
Including TV, PC and Mobile  
Based on tests and research

### Functions Level

0 – CGP essential functions

1 – Functions can significantly improve UX

2 – Meaningful functions in several scenarios

3 – Functions needed by a small number of scenarios and people