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Design Guidelines for Onboarding Experience in Narrative-rich Games

Master's thesis in Computer science and engineering

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Abstract

The first minutes and hours of a game's whole gameplay are called the onboarding phase. In this project we provided guidelines for designing the onboarding phases in narrative-rich games which contains abundant narration elements. The purpose of designing a such game's onboarding phase is to increase players' retention, to achieve this goal, the onboarding needs to provide players good sense of mastery, sense of purpose and sense of immersion. The guidelines were generated through first-person research and empirical research. In the first-person research we conducted artifact analysis on 8 narrative-rich games for how they designed their onboarding phases, the result was analyzed through affinity diagrams into 10 themes. One of the games analyzed was selected for the empirical research, in which participants played the game's onboarding and reflected on how the game influenced their experiences regarding sense of mastery, sense of purpose and sense of immersion, the result was documented and analyzed through thematic analysis. Motivated by the result from first-person research and the empirical research, we present 12 guidelines about how to design onboarding phases in narrative-rich games to increase players' senses of mastery, senses of purpose and senses of immersion.

Keywords: Design Guidelines, The Onboarding Phase, Narrative-rich Games, First-Person Research, Empirical Research.

Acknowledgements

We would like to express our deepest appreciation to the collaborative company for providing us with this valuable project, and a special thanks to the UX research team in this company for being our adviser. Even though your details need to be anonymized in this thesis, here we still need to gratefully commemorate the assistance you offered throughout the project. We would also like to extend our deepest gratitude to Dr. Mehmet Aydın Baytaş for supervising this master thesis, providing us with helpful advice and unparalleled support throughout the duration of this project. Additionally, we also wish to thank Staffan Björk and Michael Heron, professors at the Chalmers Division of Interaction Design, for providing us with extensive knowledge in the field of game related research. In the end, thanks should also go to all the players who agreed to participate in our empirical research for their helpful feedback and personal time.

Xingyu Zhang & Yibin Huai, Gothenburg, May 2021

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Abbreviations

ACT Action Game
ARPG Action Role-playing Game
BGM Background Music
DPA Data Processing Agreements
EU European Union
FPS First-person Shooter (Game)
GDC Game Developers Conference
GDPR General Data Protection Regulation
GTAV Grand Theft Auto V
GUR Games User Research
HP Hit Points
IGN Imagine Games Network
IP Intellectual Property
JRPG Japanese Role-playing Game
MOBA Multiplayer Online Battle Arena
MP Magic Points
NDA Non-disclosure Agreement
NPC Non-Player Character
N Number (Specifically refer to Participants)
PEGI Pan European Game Information
P Participant
R&D Research and Development
RPG Role-playing Game
SLG Strategy Game or Simulation Game
TCG Trading Card Game
UI User Interface
UX User Experience

1

Introduction

Onboarding is important for any digital product. According to Cascaes Cardoso, "the beginning of a relationship between the user and a platform is the moment where motivations take part" and the overall strategy (the flow, messages, interactions and UI design elements) should be carefully planned, so the experience as a whole can support new users' engagement (Cascaes Cardoso, 2017). Onboarding in games, according to Celia Hodent, is "the first minuets or hours of play and about learning how to play" (Hodent, 2017). Hodent also illustrates the importance of onboarding phase for a game and maintained that the first hour is critical to the first-time user experience. Hodent claims that if the game fails to captivate the audience's attention in its onboarding, there won't even be any retention issue to care about. Hence, designers and developers need to polish the onboarding phase in their game delicately, ensuring every aspect of the onboarding adequately colludes together towards a better player experience.

Different game genres will use different forms of onboarding. For example, the FPS games with the theme of modern warfare usually set a independent training ground episode as the onboarding phase and teach players how to operate. However, the onboarding is not just a tutorial for operation teaching player, for instance press A to attack. Hodent claims that players need to be placed in a meaningful onboarding with the well-integrated environment (Hodent, 2017), which means the tutorial is not the only and independent element in an onboarding phase. For instance, narrative-rich game genres such as RPGs and adventure games aim at specific dimensions of user enjoyment (Roth, Vorderer, Klimmt, & Vermeulen, 2010a). As a result, their onboarding integrate into the prologue or the first mission, which flexibly combined the narration, plot, worldview, operation tutorial, goals, core gameplay, mechanics, etc. together.

Cascaes Cardoso claims that the onboarding experience as a whole can support new users' engagement (Cascaes Cardoso, 2017). Hence, there is no doubt that player's retention is the ultimate goal for every onboarding. But what factors will affect player's retention? In order to answer this question, we illustrated the relevant operational definition as follows. Firstly, players need to feel a sense of mastery in onboarding. Celia Hodent claims that an players' churn rate will be high if they confuse about the gameplay in onboarding (Hodent, 2017). Secondly, player must be able to formulate the sense of purpose during the onboarding. McGonigal suggests that the sense of purpose will motivate player continually participating throughout the game (McGonigal, 2011) and Hodent also agrees that "having a sense of purpose

helps players to engage in a long-term relationship" (Hodent, 2017). The last operational definition we drafted it's a sense of immersion. Player needs to feel fun during the onboarding (Sweetser & Wyeth, 2005), and immersion is one of the factors that describe the fundamentals of an optimal experience and enjoyment (Jegers, 2007). Once player get the sense of immersion, they will constantly spend their time and effort in the game. For the above three operation definitions, we have adopted several approaches for their measurements. Regarding sense of mastery, we can first let the player judge the mastery situation by themselves to measure the player's self-confidence, and then verify it by letting the player repeat a specific operation. For sense of purpose, we can ask whether the player has formed a self-motivation goal, and let the player introduce how to achieve this goal. For sense of immersion, we can combine the observation method to confirm whether the player responds as it should in a specific game scene (for example, being frightened), in addition to letting the player to score the degree of immersion.

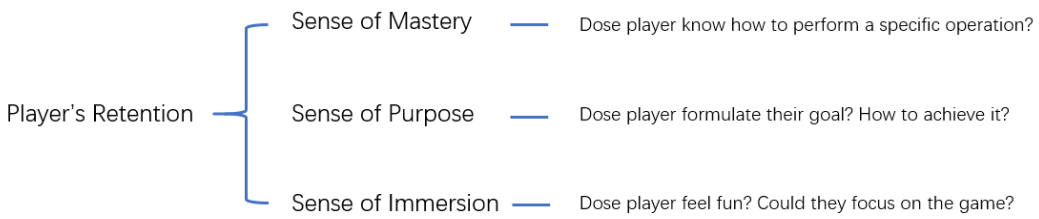


Figure 1.1: Operational definition for measuring player's retention

This thesis will be collaboratively done with a UX research team of a Chinese AAA game company, who is currently planning to enter the console game market and conducting a series of pre-production research. Two students from Chalmers University of Technology completed this project under the joint guidance of a supervisor from college and an advisor from the company. This project would employ a series of first-person researches and empirical researches, excepting to present design guidelines for the onboarding phase of narrative-rich games. These design guidelines, after being validated and revised by the client company's experts, will be saved by the client company as internal information to provide the client company's game designers and game developers with possible guidance when they are producing same-genre games.

1.1 Research Problem

As it was illustrated above, there are lots of elements in the onboarding phase that need to be took into consideration and carefully amalgamated, especially in the narrative-rich games. (The definition of narrative-rich games could be found in 3.2.) However, it could be particularly tricky for designer to create those kind of onboarding leads to retention. For example, as Celia Hodent claims, "adjusting the onboarding to the narrative could hurt the user experience by hurting the learning

curve" (Hodent, 2017), which means the tutorial elements and narrative elements are sometimes mutually exclusive in the onboarding phase. Therefore, if the elements could not be distributed and utilized judiciously in the onboarding phase, the experience of player might be negatively affected. In client company, such an important topic still lacks academic and systematic investigation, and most of the research in the company result from empirical and related to mobile games. Given the problem discussed, this project seeks to identify the factors that are needed to consider in the onboarding design of narrative-rich games, then provide design guidelines about how to utilize those factors in order to deliver the onboarding phase that leads to retention in the narrative-rich games.

1.2 Aim

This thesis aims to provide client with design guidelines for the onboarding phase of narrative-rich game through a series first-person research and empirical research. Those design guidelines could provide guidance for the designers and developers in client company when they design the onboarding phase in their future self-developed games. These design guidelines are excepted to let player establish the sense of mastery, sense of purpose and sense of immersion, eventually increasing player retention in onboarding phase.

1.3 Research Question

What factors should be considered and utilized in the onboarding design of narrative-rich games to enhance players' sense of mastery, sense of purpose and sense of immersion?

1.4 Delimitations

As to match the scope of this thesis, some limitations have been set in the beginning. Firstly, in order to make our proposed design guidelines have research and application value, some basic and universal game design guidelines that are already existed are omitted. The guidelines we generated in this thesis is focus on the onboarding experience in narrative-rich games.

Since this project is positioned as a fundamental research in the client company, no development team in the company has entered the game development cycle, so the client cannot provide any game demo to use in this project. Therefore, the entire thesis is targeted on market-proven successful games of potential competitor companies through first-person research and empirical research. Since most of the potential players of the client company are concentrated in the Chinese market, players with Chinese nationality are set as the main research targets in empirical research. During user testing, the language of the game will also be set to Chinese.

At the request of the client, the game type studied in this thesis is the narrative-rich game. Games in mainstream genres such as action, adventure, and role-playing are mostly story-driven and contain a lot of narrative elements. Therefore, such games are defined as narrative-rich games by client. Lankoski and Björk claims that "many contemporary games are too big to be described fully", so finding the parts of the games that are relevant for the current focus of interest is the first step in their research (Lankoski & Björk, 2015). In this thesis, the focus part in narrative-rich games is its onboarding phase, normally is player's first hours of play and about learning how to play (Hodent, 2017) in the beginning of a game.

Console game is the chosen platform of our research, as the name implies, console game is a form of video game, consisting of manipulable images (and usually sounds) generated by a video game console and displayed on a television or similar audio-video system. The game itself is usually controlled and manipulated using a handheld device connected to the console, called a controller (Wikipedia, 2021b). The Sony PlayStation 4 is the selected platform for this research because of its worldwide dominance in the console game market (Statista, 2020). All the games involved in this study were performed on the PlayStation 4.

2
Background

This chapter we present an project background which revealed the necessity of this project from the perspective of market. Then, the stakeholders of this project will be expatiated. In the end, we exhibited the related work in regard to the research of game design guideline, onboarding phase and narrative-rich games.

2.1 Project Background

For Chinese game companies, mobile games, which have 563.7 million players and US$ 41,483 million revenue (Statista, 2021), have always been their company's critical business and source of income, correspondingly various methods for mobile game player research have become mature and systematic. However, with the process of globalization and player iteration, China's game market is gradually showing signs of transformation. Niko Partner, an Asian game market research and consulting company, released a report on the Chinese console game market. The report shows that China's console game market generated US$ 997 million in revenue in 2019 and is expected to reach US$ 2.15 billion in 2024 (Niko Partner, 2020), and this growth will continue to increase.

Hence, many Chinese game companies are keenly aware of this market transformation and have begun to add console games to their respective businesses. But compared with their mature mobile game development, the console game is a strange field to them. Under such a circumstance, the R&D of console games has become an important research domain in the Chinese game industry, and it has become a rich field for cooperation among UX professionals, game designers, and academic researchers (Desurvire & El-Nasr, 2013).

2.2 The Stakeholders

This collaborative project resulted from the industry trend illustrated before, the collaborative client is an UX research team of an AAA Chinese game company. As the requirement of company, their detailed information will be anonymous in this paper as they required, then as well the citation in this section will not mark its source. Over the past decade, this Chinese group company continues to support and invest in the development of its game business. According to the company's 2020 financial report and independent statistical data, its games revenue grossed over hundred billion yuan (rounding data for confidentiality), which was a forceful

increase compared to 2010. Nowadays, the company's market research department has foreseen that consoles and console games consumption in the Chinese game market are growing. Therefore, a series of theoretical studies on console games have been fully launched in this company.

This project is one of these console game research, specifically targeted at the onboarding phase of narrative-rich games. Our contact person in the company is a group of UX research team in this company. Their job is to provide UX-related research covering the entire life cycle of the game development for the company's game design studios. According to the information that the contact person provided, the outcomes of this project, the expected design guidelines, will be evaluated by the experts in the company, then published on their internal database as a report that is readily accessible and actionable for the internal designers and developers in their future game development work.

2.3 Related Work

In order to understand the relevant research status and trends, we conducted literature research in multiple databases, chiefly looking for academic papers on game design guidelines, onboarding phase and narrative-rich games genre.

Game Design Guidelines

As the game industry continues to grow, there are more and more academic researches on games. Researchers based on different aspects of games, put forward a variety of game design guidelines, hoping to help game industry designers to apply. David Charles Milam (2013), for instance, presents the game design guidelines from the perspective of visual attention. From a total of 3 mixed approach studies, Milam developed the perception-based game design framework and guideline which could applied to consider perceptual features of motion affecting the visual design. The games, in particular action games, that utilize his framework and guidelines could provide players a better experience when they have engulfed in highly dynamic and sensory-rich environments. (Milam, 2013) Another example from Kankainen and Paavilainen (2019) is the guidelines development process for hybrid board games. In their study, they generated a total of 17 guidelines in virtue of game analysis, game design workshop, expert heuristic, questionnaire, and expert evaluation. By applying their guidelines, industry designers were expected to avoid common pitfalls and evaluate different trade-offs. (Kankainen & Paavilainen, 2019)

However, there is a bias between the guidelines presented in the academic paper and the application in design practice. Mueller and Isbister (2014) claim that "academic papers often aim to provide designers with abstract frameworks" (Mueller & Isbister, 2014), which is hard to directly apply and follow by the industry designer. In order to narrow the gap between theoretical frameworks and the design practice, Mueller and Isbister present a set of guidelines for movement-based games which in a format that matches the practice-based focus of the game design field.

They generated their guidelines through first-person research then examined and refined by 14 movement-based game design experts with experience in the various domains. When presenting these guidelines, they not only illustrated the explanations and terms of them, but also depicted their implication of design and "DO's and DON'Ts" strategy for designer. This form of guideline presentation mode can make it easier for industry designers with non-academic backgrounds to apply them. In this project, we intend to provide our design guidelines in the similar format that designers and developers in the client company could easily apply in their practice.

Onboarding Phase

In current academic literature, researchers usually studied the game's specific elements evaluated the player's particular experience. For instance, Lankoski and Björk utilized Formal Analysis to evaluate the gameplay of games (Lankoski & Björk, 2015), while Sweetser and Wyeth present a GameFlow model to appraise the player's enjoyment in games (Sweetser & Wyeth, 2005). It's arduous to find a article that precisely focused on the games onboarding and its interrelated player's experience. Most researchers believe that teaching new players how to play a game is challenging but crucial for engaging and retaining players (Andersen et al., 2012), which results in that some researchers regard the onboarding phase as the tutorial in their research. For example, Petersen et al. evaluated the user experience in onboarding phase of Free-toPlay mobile games by a mixed-methods approach, including physiological measures, self-reported proxy measures (Petersen, Thomsen, Mirza-Babaei, & Drachen, 2017a). Moreover, Andersen et al. employed an quantitative approach to evaluate how tutorials affect game learnability and player engagement. They conducted A/B test by implementing eight tutorial designs in three indie video games of varying complexity and effects on player engagement and retention, and collected 45,000 player's data in their multivariate study. The result shows that the usefulness of tutorials depends greatlyon game complexity (Andersen et al., 2012). Some literature also study the tutorial from the pespective of player segmentation. Morin et al. present a case of comparison between casual and hardcore players in tutorial phase. By an quantitative approach involved 43 participants, they had found that for casual players, there would be a significant increase on game experience if they play the game with tutorials, while for hardcore players, the increase was not that obvious (Morin et al., 2016).

Different from the academic paper, many industry experts or researchers published their experiential knowledge on the blog or game related website. These articles often have fewer citations and are conclusion-oriented. They do not overstate the process, but they could be closely integrated with design practice. For example, Ernest Adams expounded eight ways to make a bad tutorial on the Gamastra. The term Adams defined were both firmly practical, sucha as "Make the player read a lot" or "Punish the player's inexperience", and for each term Adams illustrated the corresponding tutorial examples (Adams, 2011). The contact person in the client company also provided us a lot of internal reports which showed how the company conduct business-based game research domestically. Due to the confidential

issues, the knowledge we acquired from company will be erased in this report. In this project, we aimed to provide design guidelines which could help the designers and developers to enhancing their game's onboarding experience through a set of qualitative approach.

Narrative-rich Games

Narrative-rich game is not a sanctioned genre, the defintion of it will be illustrated in the section 3.2 of next chapter. The game genres of console games is significantly different from mobile games. Compared with the mobile game genres that ranges from MOBA, casual, SLG, TCG, to idle, the story-driven games that contained the narrative elements is the main game genre on the console. In order to better understand the concept of narrative in games, we have also conducted research on the relevant literature of narrative-rich games. Iten et al. demonstrate a mixed-method examination of meaningful choices in narrative-rich games. Their research contained a qualitative study which investigated meaningful game choices from the players' perspectives, and a quantitative study experimentally examined the effect of meaningful game choices on player experiences of appreciation, enjoyment, and narrative engagement (Iten, Steinemann, & Opwis, 2018). Roth et al. introduce a set of self-report measures tailored particularly for narrative-rich games. With the collaboration with the experts in "Interactive Storytelling" community, they expected their literature could "support scientific examinations of the user experience in narrative-rich games and to enable comparative testing of new game prototypes and game technology demonstrators" (Roth, Vorderer, Klimmt, & Vermeulen, 2010b).

Furthermore, some researchers out their focus on the narration or narrative-related elements in games. Carstensdottir (2019) illustrates the relationship between game structure and narrative progression mechanics, it explains and classifies different game structures and narrative progression mechanics in depth, and through player testing and analysis, specifically examines interaction design in interactive narrative games about their structures and progression mechanics. In the end the literature gave suggestions that designers need to consider which progression mechanics are most suitable to the structure they plan to use and if that mechanic is recognizable to players as being a mechanism that progresses the narrative (Carstensdottir et al., 2019). There's no doublet that narrative it's an element that couldn't be ignored in the narrative-rich games. Hence, in our project we will coordinate our analysis with narrative element, and provide our guideline based on it.

3

Theory

This chapter illustrated the relevant theories of this project we found through literature review and expert interview. Firstly we embodied the overview of game related research and unraveled the theoretical model of modern game research. Then, we explained the relevant concepts occurred in this project, they are respectively our aimed outcome, targeted game genre, and focused segment within the game. In the next step, we scrutinized the factors that matter to the quality of game's onboarding, formulating three onboarding factors. These factors could make us more clear where we should study the game's onboarding. In the end, we reviewed the methodology of generating game design guides in the literature, and formed the guideline formulation strategy for this project based on our own condition.

3.1 Overview of Game related Research

When talking about the notion such as game research, game studies, game design research, and so on, the definition of these studies are always prone to equivocation. Video game is not the typical software application (Sykes & Federoff, 2006), it is a complex system contains various elements such as the graphic, audio, interaction, narration and so on. As a result, the game design is arguably a much different task than designing utility applications (Ermi & Mäyrä, 2005), so does the research related to games. As an interdisciplinary research field, there is a variety of different theories, methodologies, and research practices that co-exist in the field of game research. With the gradual prosperity of the game industry, researchers are constantly revising and elaborating the theories of game-related research.

In 2008, Staffan Björk defined that the different research foci within the game academic field were easily mapped on the three game concepts: games, gamers, and gaming. Firstly, games represented some studies that focus on the artifacts or systems that encode rules and procedures. Secondly, studies related gamers focus on the people using the artifact. Third, the studies focus on the interactions or activities that people engage in when using game artifacts are related to gaming (Björk, 2008). Contemporaneously, Frans Mäyrä proposed a similar model that the focus of game studies should be placed on the interaction between the game and its player, illuminated by their various contextual frames (Mäyrä, 2008). In the book, Mäyrä categorized the topics of game related research into three aspect: (1) study of games, (2) study of players, (3) study of the context of the previous two.

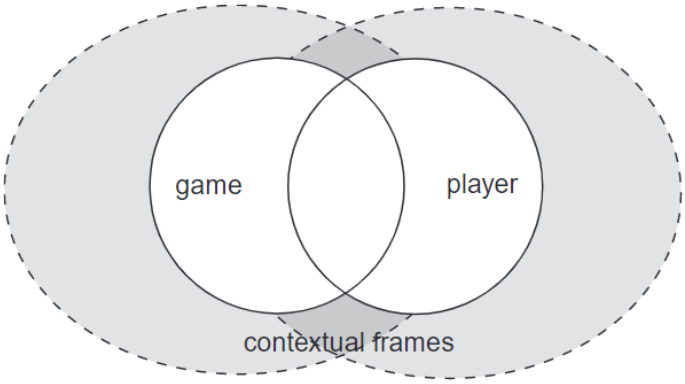


Figure 3.1: The focus of game studies in the interaction between game and player, informed by their various contextual frames (Mäyrä, 2008)

Under the theoretical model that Björk (2008) and Mäyrä (2008) presented previously, the research related to game could be positioned as being from one or more of three perspectives based upon game concepts. Björk states that "the three part of the model are strongly intertwined...should rather be seen as ways explaining choices of topics, methods, and practices" (Björk, 2008), Mäyrä also claims that "these three spheres of inquiry cannot be separated, but must be seen both as mutually interacting and complementary..." (Mäyrä, 2008). Therefore, in our project, the game, the player, and the interaction between the two are not divided, but integrated and analyzed comprehensively.

3.2 Relevant Concepts

Targeted Game Genre: Narrative-rich Games

There has been a debate about the relationship between video games and narratives among researchers, some claim digital games are a kind of narrative and the definition of narrative should be modified to incorporate games, others argue that narrative and computer games are totally different things (Aarseth, 2012). While in fact, narrative, as a game feature, is being used in a wide range of genre of games, and people believe involving narrative elements could increase "literary qualities" in the games or, from the economic aspect, make them become better products to attract more customers (Aarseth, 2004). From the perspective of game genre, adventure and RPG-type games need to be derived by a story, and a complete and clear story line must be used as the main plot to motivate and assist players constantly develop their character. Therefore, the narrative is a distinct element in this type of game.

At present, with the increasing development of the game industry, the emergence of diversified and complex games makes it very difficult to classify its genre. Excluding the classification based on the game performing platform (console, mobile, PC, etc.),

the general classification logic is defined by the way players interact with the game (Adams, 2014). The most typical example is the Call of Duty series (Activision, 2021). No matter its story background is World War II, modern war or fanciful future war, as long as it has a first-person perspective and the use of long-range weapons to attack, it will be classified as a first-person shooter game. However, as we illustrated previously, many games can no longer be simply classified into one type. Adams proposes that "genres may encompass a wide variety of games, leading to even more specific classifications called subgenres" (Adams, 2014). For example, Borderlands 3 (Gearbox, 2019) is a typical combination of FPS and RPG game genres. Hence, narrative is no longer a unique game feature for adventure or RPG games. Different games have different levels of dependence on narrative elements. Some games, like the RPG mentioned earlier, need to link the plot before and after with narration, and rely on narrative elements to a higher degree. However, some games, such as puzzle solving and sports games, rely more on their special gameplay to motivate players to continue playing. Based on the different needs for narrative, we re-categorized the types of games to make them more suitable for our projects.

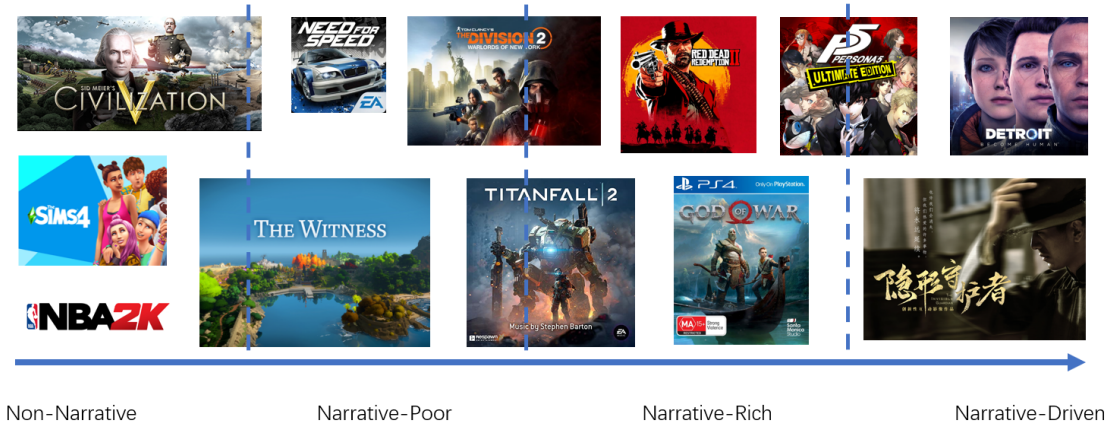


Figure 3.2: The game categorization based on their narrative

As shown in the figure 3.2 above, the game genre on the far left hardly contain any narrative elements. They only need their own special gameplay to retain players, such as the NBA2K series, Civilization V, etc. Although there are a few narrative elements in narrative-poor games, the main gameplay of the game does not need to be too closely integrated with narrative elements, such as puzzle-solving games - Witnesses. The game types on the far right are almost entirely narrative-driven, and their gameplay is less playable, and they mostly appear in interactive movie games, such as Detroit: Become Human. The research foci of this project is narrative-rich games (inside the red box in the picture). Regardless of their existing game types, as long as they have rich narrative elements in the game, and at the same time take into account the high gameplay, they can be called narrative-rich games. For example, the God of War series (Santa Monica Studio, 2018) combines action games with narrative elements, Borderlands 3 (Gearbox, 2019) is a typical example of using narrative elements in FPS games. In this project, "narrative-rich games" is used to refer to the games of this type, according to the client, narrative-rich games combine narratives with other core game elements to achieve better qualities, the focus of

this research is to figure out how to design the onboarding phases on this type of games.

Focused Segment: Onboarding Phase

Our targeted research context in this study is onboarding phase in narrative-rich games. The Onboarding in games, according to Celia Hodent, is "the first minuets and hours of play and about learning how to play" (Hodent, 2017), according to her lecture on Game Developers Conference (GDC) 2016, the onboarding phase let players learn how to play the game and have a first perception of the game experience (Celia, n.d.). In other academic papers, for instance Morin (2016) and Desurvire (2013) arguments that terms such as tutorial or introductory chapters are also used to refer the similar phase in digital games, while since onboarding is also the term used in the client company, and both Hodent's book and the client company pointed out onboarding includes both learning how to play and experiencing the game, using onboarding as the term to refer to our study context meets the requirements of the client company and fits our research content, thus this term is more relevant to our research topic.

According to the client, the onboarding phase usually refers to the content of a game from the player's first experience in game to 40 minutes or 2 hours. It usually includes game operation and gameplay tutorial, worldview instructions, mission guidance, and plot introductions and so on. Whether it is a mobile game, computer game or a console game, the onboarding phase has played an important role in attracting new users to retain and affected the UX and playability by various factors. A bad onboarding phase will typically display a substantial churn rate among new players. It is therefore vital for researchers and designers in the company to effectively evaluate this phase to investigate its satisfaction of the player experience (Petersen, Thomsen, Mirza-Babaei, & Drachen, 2017b).

Aimed Outcome: Game Design Guideline

Our anticipated outcome would be design guidelines about developing the onboarding phases in narrative-rich games, as Cambridge Dictionary explains, a guideline is "a information intended to advise people on how something should be done or what something should be" (Cambridge University Press, 1999). When this word uses design as the attributive, it becomes Design guidelines, which are sets of recommendations towards good practice in design. They are intended to provide clear instructions to designers and developers on how to adopt specific principles (Interaction Design Foundation, n.d.). It is also the medium between design principles and design rules. Daniël De Wit illustrates the relationship between design principle, design guideline and design rule in his article, when the design principle is "Educational", the design guidelines would be "Educational tutorials contain well explained visuals", correspondingly the design rule which tells designer exactly how to do things would be "Every visual contains a title in Roboto, 64 pixels in size" (Wit, 2019).

Mueller and Isbister provided an example of generating design guidelines for the movement-based games (Mueller & Isbister, 2014). In the article, they created the guideline about designing movement games through insights from analyzing several existing movement games (i.e. they used their bodies to play the games and took notes) in combination with their knowledge about game development, then tested and validated the guideline through user tests and online feedback from players and experts. The table below illustrates part of the guidelines Mueller and Isbister delivered:

Table 3.1: Part of Design Guideline in Movement-Based Games (Mueller & Isbister, 2014)

Guidelines	Explanation	DOs and DON'Ts
Embrace ambiguity	Instead of fighting the ambiguity of movement, embrace it	DO use the ambiguity of movement and sensor data to enhance the game & DON'T use buttons during the early development phase
Focus on the body	Focus on the body, not just the screen, when designing player feedback	DO start imagining your game without a screen & DON'T Forget that for players who feel self conscious or reluctant to move, diverting attention away from the body might be beneficial to reduce the barrier to play
Intend fatigue	If you use fatigue as a game challenge, make it intentional rather than incidental	DO use the management of fatigue as a game mechanic & DON'T assume players know how to manage fatigue, support them in figuring it out
Map imaginatively	Map movements in imaginative ways	DO engage your creativity in the mapping process & DON'T use this guideline if you want to simulate a real-world sports experience, such as designing a golf simulator.

Our guidelines output will also follow this format that make it easier for industry relevant personnel to apply them. Our guidelines generation strategy will be introduced in the section 3.4 and be illustrated in the section 5.1 more in detail.

3.3 Defining Onboarding Factors

Since the onboarding design guidelines are the aimed outcomes in this project, some factors are needed to settle down for justifying the quality of an onboarding. In order to formulate the rationalized onboarding factors, we firstly conduct the expert interview and literature review to acquire business-based and experience-based knowledge. Two experts in the field of game research from the client's company accepted our interview, and they provided us four dimensions that they would consider and emphasize when they do the evaluation about onboarding, but due to the confidential agreements the information they provided needs to keep private. Since the dimensions can not be directly applied to our project, and the information provided by the client can only provide an empirical reference for our project. We had to formulate our own factors for justifying the quality of the onboarding phase. In order to formulate the rationalized factors, a literature review was conducted.

The Ultimate Purpose: Player's Retention

There is no doubt that making new players willing to retain is an inescapable and critical responsibility of an onboarding phase in game. According to Cardoso, the beginning of a relationship between the user and a platform is the moment where motivations take part, and the onboarding experience as a whole can support new users' engagement (Cascaes Cardoso, 2017). Therefore, a successful game onboarding phase should make the player willing to continue playing the game at the end of it. At this point, we can determine that "Player's Retention" is a criterion to measure the quality of onboarding in games. Then the following question is to figure out what makes players willing to retention? Priscila Correia claims that players need to understand the goals and how to play the game in the onboarding phase, otherwise the possibility of them retaining would be very low (Priscila, 2020). While Sweetser and Wyeth argue that play should feel the tutorial process like playing the game, and this process should not be boring but be part of the fun (Sweetser & Wyeth, 2005). In summary, there are three factors that are critical to the player's retention in onboarding phase. They are respectively "how to play" and "what is the goal", "should not be boring".

Factor 1: Sense of Mastery

Sweetser and Wyeth maintain that games must support player skill development and mastery. Players should be taught to play the game through tutorials or initial levels (Sweetser & Wyeth, 2005). Indeed, the tutorial is the most important part of the onboarding phase, and the player's mastery of the operation is the basis for player retention. Celia Hodent agree that an unpolished onboarding will make players confuse about the gameplay and eventually make players churn (Hodent, 2017). If

the player is unable to master the operations and the core gameplay of the game in the onboarding phase, any other gameplay experience will be negatively affected, and ultimately decrease the player's retention rate. Thence, "Sense of mastery" has been defined as an onboarding criterion.

Factor 2: Sense of Purpose

McGonigal, in his book Reality Is Broken, illustrate a concept named sense of purpose. McGonigal augment that the sense of purpose is provided by goals, and McGonigal suggests the goal as "the specific outcome that players will work to achieve, and focuses their attention and continually orients their participation throughout the game" (McGonigal, 2011). Therefore, as McGonigal illustrates, the goal is not just a mission checkpoint, and the "Sense of purpose" does not just literally mean the quest navigation or can perceive the way-point in games, it's a comprehensive motivation that stimulates the player's enthusiasm in games constantly. It may be some kind of reward, special plot, attribute upgrade, or any other game content that players are expecting. Hodent agrees that having a sense of purpose helps players to engage in a long-term relationship (Hodent, 2017). Thus, if the player could establish a sense of purpose in the onboarding phase, the player can be self-driven to retention, thereby the "Sense of purpose" is decided as an onboarding criterion.

According to the information that client company provided, sense of purpose consisted two layer of concepts. First it's the goal that player formulated by themselves and could motivated them to constantly play the game. This goal could related to any elements in the game, but since this project targeted at the narrative-rich games, the player's expectation and curiosity about the following narration could be count as a major and typical goal. Another layer of concept is know how to achieve this goal, this is going to change depending on the goal. For instance, if a player has formulated a goal to collect all the items in the map, he need to know the navigation towards the various cache sites. If the player want to enjoy the story and be carious to the season finale, he need to know how to complete the main mission. Thus, when we inspect the sense of purpose in the game's onboarding, this two layer of concepts will both be took into consideration.

Factor 3: Sense of Immersion

Some definitions usually only equate onboarding phase with the learning phase covering the core game mechanics. For instance, Chou claim that the purpose of the onboarding process is to introduce a new user to the product and equip the user with the knowledge necessary to interact completely with the product's feature set (Chou, 2019). In this opinion, once players mastered how to play the game and figured out what is their goal, it can signify the end of the onboarding phase. But Sweetser and Wyeth argue that play should feel the tutorial process like playing the game, and this process should not be boring but be part of the fun (Sweetser & Wyeth, 2005). Thus, players should perceive the enjoyment during the onboarding, in more general terms, a good game should make player feel fun. According to Cheng and Cairns, immersion is recognised as an important element of good games

(Cheng & Cairns, 2005), and the player's persistent willingness to play is associated with immersion (Brown & Cairns, 2004).

However, the evaluation of immersion is laborious, which usually involved the physiological measurements. In order to stick to our scope closely, we defined the sense of immersion as one of the onboarding factors, but delimited it into the narrative of game. As the game is gradually defining as the ninth art, more and more modern games are not only designed for playing, but also to let players experience a story during the game. This transform requires the onboarding phase must take the narration design into consideration. According to Adams and Dormans, games might have a narrative thread, whether designer-driven or player-driven, that binds events together drives the player toward completion of the game (Adams & Dormans, 2012). When a movie's narrative is dull, the audience will often feel bored. Game, as the ninth art, the quality of its narrative design will directly affect the player's immersion in the game plot, thereby affecting the retention. Hence, the "Sense of immersion" is formulated as the last factors.

The Successful Onboarding Phase

In order to achieve the goal of this project (providing the design guidelines of the onboarding phase in narrative-rich games), we have to define what is the successful onboarding phase and its corresponding factors so as to observe and measure it in the following study. For the reason that we conducted the literature review expounded above, and formulated the results as the factors of an onboarding phase. Figure 3.3 below illustrates the relationship between those factors.

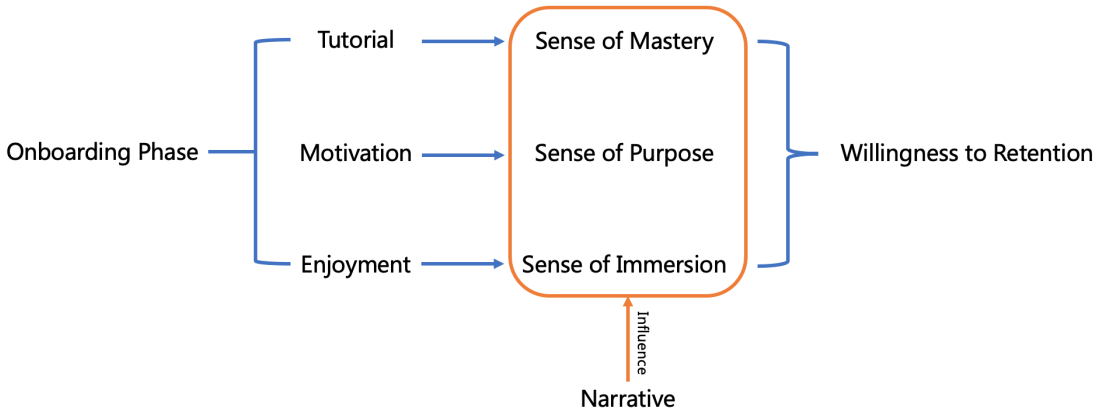


Figure 3.3: Onboarding factors

As the figure 3.3 demonstrates, sense of mastery, sense of purpose and sense of immersion are the three basic senses that affect the willingness to retention straightly. Only when a player has mastered the operation through tutorial, found the motivation for himself, and feel enjoyable during this process, he can decide to continue

with this game. However, as the target genre of this project, narrative games have the storytelling duty in their onboarding phase, which will cause some influence on the sense of mastery and sense of purpose. For example, as Celia Hodent claims, adjusting the onboarding to the narrative could hurt the user experience by hurting the learning curve (Hodent, 2017), which means when designing the onboarding phase of a game with narrative elements, the designer needs to carefully consider and reasonably combine tutorial and narrative. Hodent also illustrates an example that "use cutscenes parsimoniously and favor a narrative design embedded in gameplay, letting players be in control". Similarly, too many narrative elements, such as cutscenes, will make the player confused about the goal and unable to find a motivation for himself to continue the game. Therefore, when designing the onboarding phase, the relationship between the three factors in the picture above should be reasonably arranged and mixed, and the tutorial content should be effectively delivered on the basis of providing the player with narrative immersion, and in the same time help the player establish a sense of purpose. Finally, make the player want to continue playing the game.

3.4 Guideline Generation Approach

In the guidelines generation process of Mueller and Isbister (2014), they firstly participated in a number of movement-based games by themselves and took the filed notes. Afterwards, they analysed these notes and combined their professional experience to deliver the findings and formulated their design guidelines (Mueller & Isbister, 2014). In the research that Kankainen and Paavilainen (2019) conducted, they also included the similar approach. During the their process of exploring the guidelines for the hybrids board games, they firstly playtested numerous of hybrid board games with industry expert together in an analysis workshop. Through this game analysis, researchers understood how to pereive current solutions of hybridity in board games and what is valuable in hybridity (Kankainen & Paavilainen, 2019).

First-Person Research Approach

In the above two literature, the researchers first conducted research from the perspective of themselves, experienced and analyzed several typical games of their targeted game genres, then combined with their own research experience to deliver design guidelines. This kind of research approach that involves data collection and experiences from the researcher themselves was designated as First-Person Research (Lucero et al., 2019). In the field of game research, it's a eminently useful approach to analyze the game as an artifact. For instance, the formal analysis presented by Lankoski and Björk (2015) and the critical analysis introduced by Ian Schereiber (2009). However, these guideline generation that utilized the first-person research has emerged from Mueller and Isbister's 20 years of research-based game design practice and engagement with the movement-based game field (Mueller & Isbister, 2014). In our thesis, we researchers are students with a lack of game research experience, the findings we obtained only through our first-person research are likely to have deviations, which requires us to associate other empirical approaches to provide

complementary data.

Empirical Research Approach

Nacke et al. claim that games are artifacts that unfold their full potential in the interaction with human players (Nacke et al., 2009a). In the field of game research, the empirical research usually conducted with player, examining their in-game behaviour, preference, attitude and feedback in the user test, so as to provide researchers with the empirical evidence from the real player. For instance, Games User Research is a typical empirical approach. GUR is "an interdisciplinary field of practice and research concerned with ensuring the optimal quality of usability and user experience (UX) in video games" (Drachen, Mirza-Babaei, & Nacke, 2018). And according to Zammitto from Electronic Arts, major game developers and publishers such as Electronic Arts, Microsoft, Sony, Ubisoft etc. always conduct GUR in-house (Zammitto, 2018). In a word, empirical research like GUR can provide researchers with a theoretical evidence from the perspective of real players, which provides an opportunity for us, who are not experienced in game research, to enhance the credibility, universality, and authenticity of our guidelines.

4

Methodology

This chapter consisted of elucidations among the different methods that have been utilized during the different stages of this project. They are respectively the methods in pre-study, first-person research, empirical research and validation. In the end of this chapter we also illustrated the planning of this project.

4.1 Pre-study Methods

In the early stage of our project, we used the literature review as our pre-study method to summarize the previous research experience, and get a preliminary understanding of the current situation of the field we are going to study. We have conducted interviews with experts in the clients' company, generated a deeper understanding of the business-based and experience-based games research knowledge.

4.1.1 Literature Review

Literature review are the common kick-offs of academic researches, it can provide a fundamental understanding of knowledge on the topic (Rowley & Slack, 2004). In our case, the literature review can help generate a holistic impression of the unique player research method of industry benchmark companies and the concepts as well as the academic research methods related to this project.

The topics covered in the literature review are illustrated as follows:

- Game related Research Methods
- User Research in Game Field
- Game Design Guidelines
- Narrative in Games
- Onboarding in Games and its Experience Measurement

Through the whole process of literature review, we were able to plan the procedure and select the methods of this project reasonably, then conduct the project smoothly. However, there were some troubles during the literature review. For instance, the design guideline generation methods were unable to define and apply by reviewing the literature since the researchers in those literature usually described that their guidelines were delivered based on their rich field experience, in those literature there lacked a clear and structured methodology of generating guidelines. Therefore,

more literature were reviewed and an expert interview was conducted in order to rationalizes the unclear part in our project.

4.1.2 Experts Interview

User research is an important part of design work. The main outcome of this project is the design guidelines, and the researcher in the client's company will be our initial user. Therefore, it is very important to be familiar with the current game research mode and clarifying their problems and requirements. Furthermore, the results of expert interviews not only provide us a systems-level view of our project area (Design Kit, n.d.), but also allow us to follow in the selection and evaluation of methods in the following process. The results of experts interview combined with the findings in the literature review could help us plan the project and select the reasonable approach to deliver the guidelines.

4.2 Methods in First-Person Research

First-person research is widely used when studying the digital product as an artifact and analyzing the characteristics or content of it. This kind of research approach usually involved data collection and experiences from the researcher themselves (Lucero et al., 2019). Video game is not the typical software application (Sykes & Federoff, 2006), it is a complex system contains various elements such as the graphic, audio, interaction, narratives and so on. When analyzing the content of the game as a artificial object, the researcher can combine his own professional knowledge to review the design elements in the game.

At present, many researchers have made contributions in the first-person research and summarized their research theories in the literature. For instance, Lankoski and Björk (2015) utilized Formal Analysis to evaluate the gameplay of games. They claim that formal analysis was explicitly or implicitly used in various studies of games. David Myers (2010) applied it to study the aesthetics of games, whereas Björk and Holopainen (2006) used it to derive design patterns (Lankoski & Björk, 2015). Through formal analysis, researchers can gain understanding of game system that can benefits the future analysis in a later step (Munsterberg, 2009). Another example calls Critical Analysis, which proposed by Ian Schereiber (2009) in his online course "Game Design Concepts". Schereiber maintain that critical analysis looks at the parts of games and analyzes how the in-game features interact, in order to articulate how each part relates to the play experience. Schereiber implicate that critical analysis is not just a game review about listing the problematic field in the game. Instead of "fault-finding", Schereiber define the word "critical" means a comprehensive and impartial observation of the game (Ian, 2009).

Following are the specific methods that we utilized in the first-person research.

4.2.1 Artifact Analysis

Game, as a digital product, could be studied as an artifact. Björk claim that the researches on games represented some studies that focus on the artifacts or systems that encode rules and procedures (Björk, 2008). If we study the game as an artifact and analyze the design features contained in its onboarding phase, then the artifact analysis is very useful in this process. According to Hanington and Martin, artifact analysis is a systematic examination of the material, aesthetic, and interactive qualities of objects contribute to an understanding of their physical, social, and cultural contexts (Martin, Hanington, & Hanington, 2012). They maintain that the emphasis of artifact analysis is on the object itself and the researcher is attempting to understand the substance of the object and what it says through its various aspects, for instance, material, aesthetics, interaction and so on. Moreover, Janet and Stolterman propose that artifact analysis can be an analytical tool that designer can use to analyze the complex interaction objects (Janlert & Stolterman, 2008), such as games.

In the filed of HCI, Lee et al. utilized the artifact analysis to explore researcher and user framing of robot design, "developed to help designers handle the complexity of digital artifacts" (Lee, Šabanovic, & Stolterman, 2014). In their articles, the task of each participants was to discuss and comment on each picture of the robot (for example, favorite and least favorite parts, possible functions and uses of the robot), and to comment on the relevant categorization standards. Their research results found that users are more concerned with the complexity of robot interaction, while researchers are concerned with internal and external complexity.

Hanington and Martin argue that artifact analysis can be an informative tool to help understand physical and digital objects (Martin et al., 2012). Therefore, games as the digital objects are eligible to apply artifact analysis in their research domain. They also maintained that artifact analysis can be a useful tool for examining and comparing precedent and competitive products, which resembles to the UX competitor analysis provided in the book Games User Research (Drachen et al., 2018). McAllister and Long in that book claim that UX competitor analysis aims to analyses the competitor's games and answer these questions by identifying both good and bad UX implementations from targeted games (McAllister & Long, 2018), which is in line with the opportunity that artifact analysis provided for a design researcher to systematically generate insights and inspiration for future product/service designs (Noah, 2017). In the client company, researchers also conduct similar approach in evaluating games where they play the games themselves and extract key features about those games to help themselves figure out the questions about pros and cons, they called this competitor desk research. Hence, artifact analysis was selected as a methods in first-person research.

4.2.2 Affinity Diagram

Affinity diagram is a business tool that can help arrange many pieces of data into manageable groups (Plain, 2007). In business management, it allows large numbers

of ideas stemming from brainstorming to be sorted into groups, based on their natural relationships, for review and analysis (Wikipedia, 2021a). Affinity diagram is a great method which can help create a straightforward overview of findings from other research activities (Dam, 2020). It can also help the research team gain a shared understanding, and observe further test sessions (Group, 2018) .

In this project, we utilize this method to gather together the data we collected in the artifact analysis, sorted out and analyzed the data, so as to integrate their commonalities. To better document the results, we conducted the methods digitally with Figma (Figma, 2016) instead of physically with sticky notes. The results would be themes regarding the commonalities among all of the game features we extracted from the artifact analysis, they are the start point of generating the guidelines.

4.3 Methods in Empirical Research

Empirical research is a type of methodology that uses empirical evidence (i.e. gaining knowledge by means of observations or experience) (*empirical research*, 2021). In the field of game related research, the empirical research usually conducted with player, examining their in-game behaviour, preference, attitude and feedback in the user test. Nacke et al. claim that games are artifacts that unfold their full potential in the interaction with human players (Nacke et al., 2009a).

As the gaming industry matures and games become more and more complex, academia and industry are also paying more attention to the research on players and the interaction between players and games (Nacke et al., 2009b). For instance, the rising of Games User Research (GUR) is one of its consequence. According to Anders et al., GUR is "an interdisciplinary field of practice and research concerned with ensuring the optimal quality of usability and user experience (UX) in video games" (Drachen et al., 2018). In its extended definition, it emphasis that "any aspect of a video game that influences the user's experience and perception of that game is of concern for an investigative GUR practice". In the game industry, companies are also paying more and more attention to empirical research through the interaction between players and games. According to Zammitto from Electronic Arts, major game developers and publishers such as Electronic Arts, Microsoft, Sony, Ubisoft etc. always conduct GUR in-house (Zammitto, 2018). The experts in the client's company also described GUR as: "it is a concrete application of user research in the game field and many player research methods are also migrated from user research. Through GUR, game developers can better understand players, so as to design or improve game playability and experience."

Our empirical research was conducted in the form of user test. Through empirical research, we can acquire the empirical evidence that could be complementary to the data we amassed in the first-person research. Below we illustrated the methods we employed in the empirical research.

4.3.1 Direct Observation in Controlled Environments

Direct Observation in Controlled Environments involves observing users in an environment controlled by researchers, e.g. under purposely built usability labs or portable labs (Sharp, Preece, & Rogers, 2019). In Games User Research, it often refers to observing the player's playing or otherwise interacting with the game and its components (Drachen et al., 2018). In our project, we would let participate play the onboarding phase of selected game, meanwhile researchers would take the field notes and record player's whole gaming process. We combine the results of observations with interviews, by reviewing the video with the participant and asking for specific information. In this way, we completed the data conversion and integration of the interview and observation two approaches.

4.3.2 In-depth Interview

In-depth interviews can be an excellent way to collect information about players' preferences, opinions, experiences, and more, but only provided they are approached carefully and systematically (Mohseni, Liebold, & Pietschmann, 2015). Through the combination of observation and in-depth interview, researcher can figure out participants' individual game experience and help argument the understanding of why users do what they do that be observed in the user testing (Drachen et al., 2018). Normally, structured In-depth interviews need to have scripts, to remind the moderator about the topics that they need to cover (Drachen et al., 2018). But the client expert claims that the scripts can be flexibly adjusted according to the observed special game behaviors and the actual situation during the interview. In our project, we would conduct a semi-structure in-depth interviews after observation. we would interview participants for their comments regarding the whole onboarding process, especially inquiring the aspects of sense of mastery, sense of purpose and sense of immersion.

4.3.3 Thematic Analysis

Thematic Analysis is an accessible, flexible, and increasingly popular method of qualitative data analysis (Braun & Clarke, 2012), and it's an useful technique for analyzing non-quantitative data (Kabay, 2003), such as interview transcripts (Jack, 2019). Thematic analysis as an qualitative approach has been widely employed in the game related research. Teruel et al. applied thematic analysis to define an awareness interpretation for collaborative computer games (Teruel, Navarro, González, López-Jaquero, & Montero, 2016), while Lu et al. utilized thematic analysis to explore the possibility of using narrative game design to increase children's physical activity (Lu, Green, & Thompson, 2019).

Jack Caulfield claims that "there are various approaches to conducting thematic analysis" (Jack, 2019), and then Caulfield provided a common six-steps procedure to conduct the thematic analysis:

1. Familiarization

2. Coding
3. Generating themes
4. Reviewing themes
5. Defining and naming themes
6. Writing up

In our project, thematic analysis was employed in the data analysis of empirical research. This analysis has been conducted by means of a step-by-step thematic analysis of current interpretations that led us to extract the most relevant awareness elements defined in existing interpretations. Though thematic analysis, the text data obtained in the empirical research was summarized into several themes to facilitate the generation of design guidelines.

4.4 Generation and Validation Methods

The data acquired from first-person research and empirical research would be merged and assimilated through inductive analysis to generate our game design guidelines. According to the client, this project is the fundamental research which is far before the game development cycle, so our client doesn't have a game prototype that can be directly used to test or apply the guidelines. Thus, we choose expert evaluation to validate and refine our guidelines.

4.4.1 Inductive Analysis

Qualitative data is typically used to support inductive or abductive inferences (Mohseni et al., 2015), so do the results generated in the first-person research and empirical research. Here we utilized the inductive analysis to integrate and analyze these two complementary qualitative results. Thomas provided a general inductive approach for analysis of qualitative evaluation data (Thomas, 2006).

Thomas demonstrate the procedures that are used for the inductive analysis of qualitative data:

1. Preparation of Raw Data Files (data cleaning)
2. Close Reading of Text
3. Creation of Categories
4. Overlapping Coding and Uncoded Text
5. Continuing Revision and Refinement of Category System

As Thomas claims, inductive analysis approach could "condense extensive and varied raw text data into a brief, summary format", "establish clear links between the research objectives and the summary findings derived from the raw data" and "develop a model or theory about the underlying structure of experiences or processes that are evident in the text data".

In our project, we utilized the inductive analysis to analyze the results of first-person research and empirical research comprehensively, and delivering the design guidelines from these text data based on our research objects.

4.4.2 Expert Review

The generated design guidelines will be empirically evaluated by means of expert review aimed at assessing whether the implementation of those guidelines would improve the experience of onboarding. An expert review is an inspection method designed to identify usability problems in an online product or service. The review is carried out by a small group of usability experts (between 1 and 4), who analyse the product or service in the shoes of a typical user to identify any potential usability issues (Experienceux, 2021). Unlike most of other UX design methods, expert review is performed through inspection with experts. The inspection is done assessing some beforehand agreed upon guidelines, and each person is then individually going through the system with those guidelines in mind, writing down potential issues (Lorin & Thorsager, 2019). Expanded by heuristic evaluation, expert review are often conducted by assessing the design not only for compliance with heuristics but also with the emphasis of the reviewers' knowledge of expertise and past experience (Design Kit, n.d.).

In this case, we will conduct expert evaluation with the industry experts in the client company, as the end user, they will inspect the applicability of generated guidelines, and discuss the implementation of design with us together.

5

Planning

In this chapter, we illustrated the planning process of our project. The first section shows the overall strategy of this project. Relying on the guideline generation approach reviewed in the literature research, we have drawn up the approach that is most suitable for us. The second section illustrates the detailed procedure of this project, including specific methods for each approach. In the end, we illustrated the time plan of our project, for keeping our thesis work on track and letting audience to check.

5.1 Overall Approach

When we were planning our guideline generation approach, we conducted the literature review on this topic. There were two literature provided us lots of inspiration. Mueller and Isbister provided design guidelines for movement-based games (Mueller & Isbister, 2014). While Kankainen and Paavilainen presented guidelines for hybrid board games (Kankainen & Paavilainen, 2019).

Synthesizing their approaches, we can draw a macro-level path for game design guideline generation, which is analysis, then generation, and in the end evaluation. But in detailed there are some differences between these two approachs.

In the guideline generation process that Mueller and Isbister provided, they firstly experience and analyze several existed movement-based games by themselves. They didn't give a specific name of this method, but since it involved data collection and experiences from the researcher themselves, it could be recognized as an approach of First-person Research. Then, they combined the research results with their 20 years experience to generate the guidelines. And In the end they conduct User test and online feedback to evaluate these guideline.

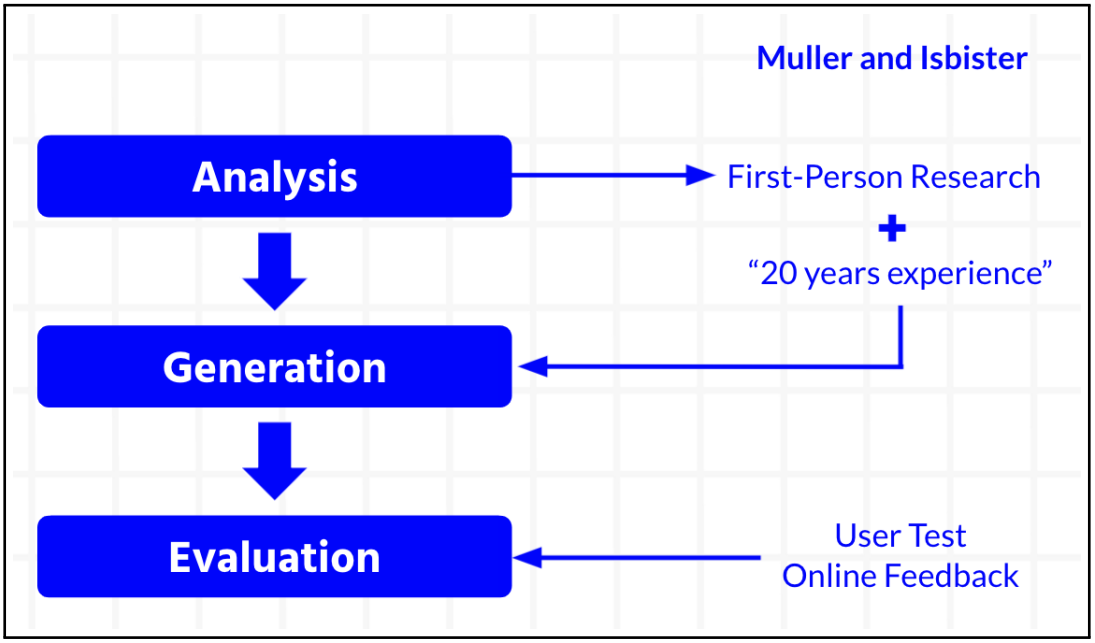


Figure 5.1: Mueller and Isbister's guideline generation approach for movement-based games (Mueller & Isbister, 2014)

On the other side, Kankainen and Paavilainen had the similarly kick-off by first-person research. They utilized a method they called Game Analysis, which is also experience and analyze the existed hybrid board games. Afterwards, they let the industry expert involved in the guideline generation, such as expert heuristic and co-design. Then they use questionnaire and expert evaluation to validate and refine.

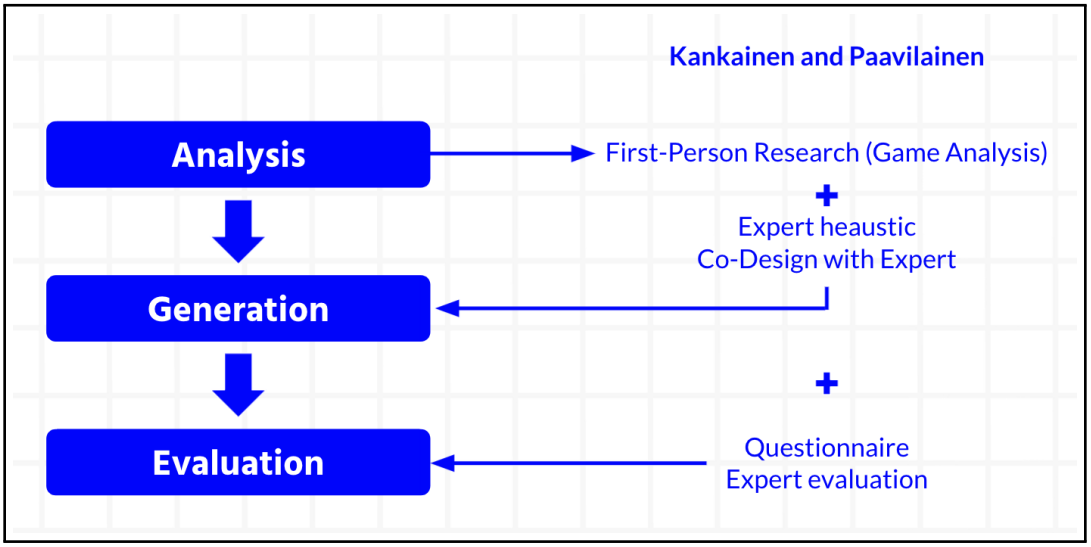


Figure 5.2: Kankainen and Paavilainen's guideline generation approach for hybird board games (Kankainen & Paavilainen, 2019)

Based on these approaches that provided by these related work, we planned our approaches. Firstly, we also conduct the first-person research to analyze the existed

market-proven successful narrative-rich games. But, we don't have ether 20 years experience or enough industry expert to involve in. Therefore, we conducted empirical research instead, letting the real player involved in the research process, and the results from first-person research and empirical research are complementary with each other. And in the end, we asked the expert in the client company to evaluate our generated guidelines from the business and design practical perspective.

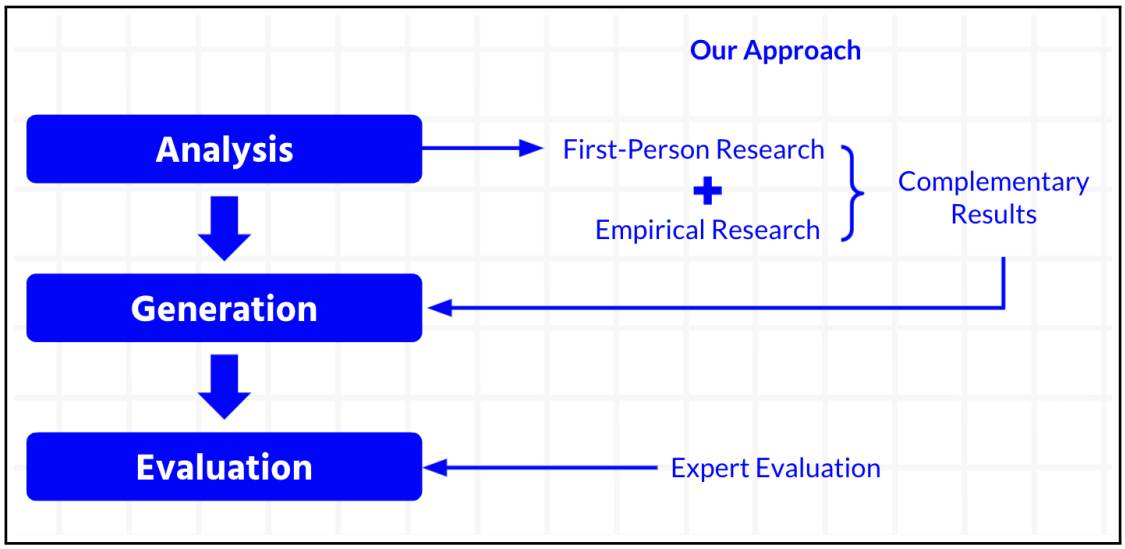


Figure 5.3: Our guideline generation approach

5.2 Procedure

In this section, we will illustrate the formulation process of our project plan. After a series of literature review, expert interview as well as meetings with our supervisor and advisor, we finally articulated the theories in terms of our project, and determined the methodologies we want to follow. The figure 5.4 showed the overview of our project plan.

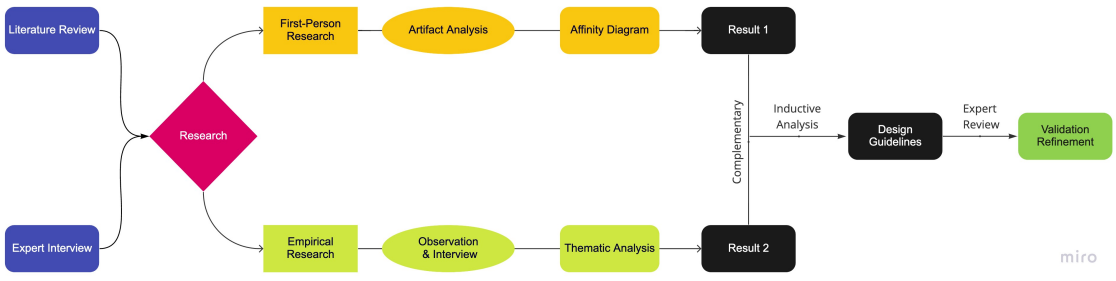


Figure 5.4: The flowchart of project procedure

The flowchart above illustrated the overview plan for this project. In the pre-study phase, we conducted series of literature reviews and expert interviews to gain enough

knowledge in the field of relevant research from both academic and industry perspective. Then when we headed to the research phase, there were two different approach we employed. One is first-person research, and another is empirical research. In the approach of first-person research, we firstly operated artifact analysis to 8 famous narrative-rich games, inspecting their onboarding phase and analyzing the acquired data by affinity diagram. In term of empirical research approach, we utilized the user test methods such as observation and interview, obtaining the empirical data from real player. Then we conducted the thematic analysis to integrated the result of empirical research. In the end, we employed the inductive analysis, coordinated and unified the two complementary results respectively from first-person research and empirical research. In this way, we delivered the aimed onboarding design guidelines with the evaluation and validation from industry expert.

5.3 Time Plan

The table 5.1 illustrated the different phase of this project and its corresponding estimated time plan.

Table 5.1: Time plan of this project

Phase	**Time Plan**
Thesis Proposal	2021.01.19 - 2021.01.30
Pre-study	2021.01.19 - 2021.02.08 (Persistent)
First-Person Research	Artifact Analysis Game 1 & 2: 2021.02.01 - 2021.02.07 Artifact Analysis Game 3 & 4: 2021.02.08 - 2021.02.14 Artifact Analysis Game 5 & 6: 2021.02.15 - 2021.02.21 Artifact Analysis Game 7 & 8: 2021.02.22 - 2021.02.28 Affinity Diagram: 2021.03.01 - 2021.03.15
Empirical Research	Planning User Test: 2021.03.16 - 2021.03.20 Pilot Test and Refinement:2021.03.21 - 2021.03.29 Conducting User Test: 2021.03.30 - 2021.04.16 Thematic Analysis: 2021.04.17 - 2021.04.27
Guideline Generation	Generation: 2021.04.28 - 2021.05.05 Refinement: 2021.05.06 - 2021.05.10
Thesis Writing	2021.05.11 - 2021.06.14

6

Execution | First-Person Research

Based on the project plan we drafted previously, in this project, the execution process of generating design guidelines can be divided into two main steps, they are respectively first-person research and empirical research. The first step after planning is to conduct a first-person research that involves data collection and experiences from the researcher themselves. This step utilizes the artifact analysis (Martin et al., 2012) method to analyze 8 well-known narrative-rich games and articulate what in-game design features they employed in their onboarding phase. Later on, we integrate the extracted game features by affinity diagram (Dam, 2020).

6.1 Artifact Analysis

According to Hanington and Martin, artifact analysis is a systematic examination of the material, aesthetic, and interactive qualities of objects contribute to an understanding of their physical, social, and cultural contexts (Martin et al., 2012). They maintain that the emphasis of artifact analysis is on the object itself and the researcher is attempting to understand the substance of the object and what it says through its various aspects.

Salen et al. (2004) define the the game as "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome", they also claimed that artificiality is one of the defining features of games (Salen et al., 2004). Hence, games can also be treated and studied as artifacts with complex interactivity. By utilizing the artifact analysis, we can straighten out how these market-proven successful narrative-rich games devised their onboarding phase and articulate what design elements they employed in their games' onboarding. Moreover, we researchers need to subjectively analyze the design elements in the process of artifact analysis, and surmise their effects on onboarding experience and the possible behaviors from the potential player.

In this project, a total of 8 narrative-rich games were selected for in-game design elements extraction. With the development of the game industry, many games can no longer be simply classified into one type. For example, Borderlands 3 (Gearbox, 2019) is a typical combination of FPS and RPG game types. Therefore, narrative is no longer a unique game feature for RPG games. Among our selection, in addition to their narrative features, they all got high reputation from the market after release which can prove that they must have some merits in their game design. Based on

their self-identified game genre and gameplay, those selected games are divided into four categories:

Table 6.1: Selected games for artifact analysis

Game Genre	Selected Games
Sandbox Games	Grand Theft Auto V (Rockstar Games, 2013) Red Dead Redemption 2 (Rockstar Games, 2018)
Open-World RPGs	Horizon Zero Dawn(Guerrilla Games, 2017) Ghost of Tsushima (Sucker Punch Productions, 2020)
A/J RPGs	God of War (Santa Monica Studio, 2018) Persona 5 (Atlus, 2016)
Shooting Games	Titanfall 2 (Respawn Entertainment, 2016) The Division 2 (Ubisoft, 2019)

First of all, before each artifact analysis, we need to delimit the onboarding phase for each games. When Lankoski and Björk conducted their formal analysis in gameplay, they claim that many contemporary games are too big to be described fully, so finding the parts of the games that are relevant for the current focus of interest was the first step in their research (Lankoski & Björk, 2015). Therefore, when we were conducting the artifact analysis on 8 narrative games, the first thing we did was to defined and clarify the onboarding phase in each selected games. The figure 6.1 below illustrates the example of how we defined the onboarding phase.

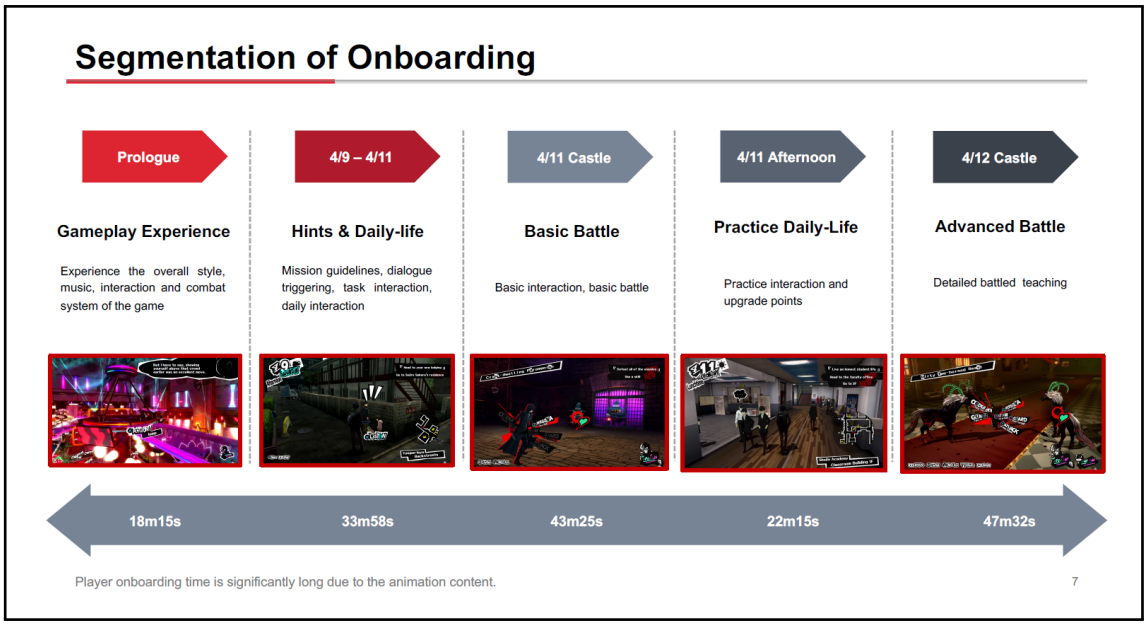


Figure 6.1: Within artifact analysis report: The segmentation of onboarding phase of Persona 5

Afterwards, we began to describe the design elements which related to the sense of mastery in the onboarding phase. Then we depicted the results of the those design elements when put in motion, trying to ascertain how do the different those design

elements interact with each other and why designer chose those elements and not others. For each games, their tutorial content, interface, format, procedure, setting, structure, and characteristics are all extracted and discussed in conjunction with whether the teaching effectiveness has been increased or not. The figure 6.2 below illustrates the example of how we extracted the tutorial components and its action:

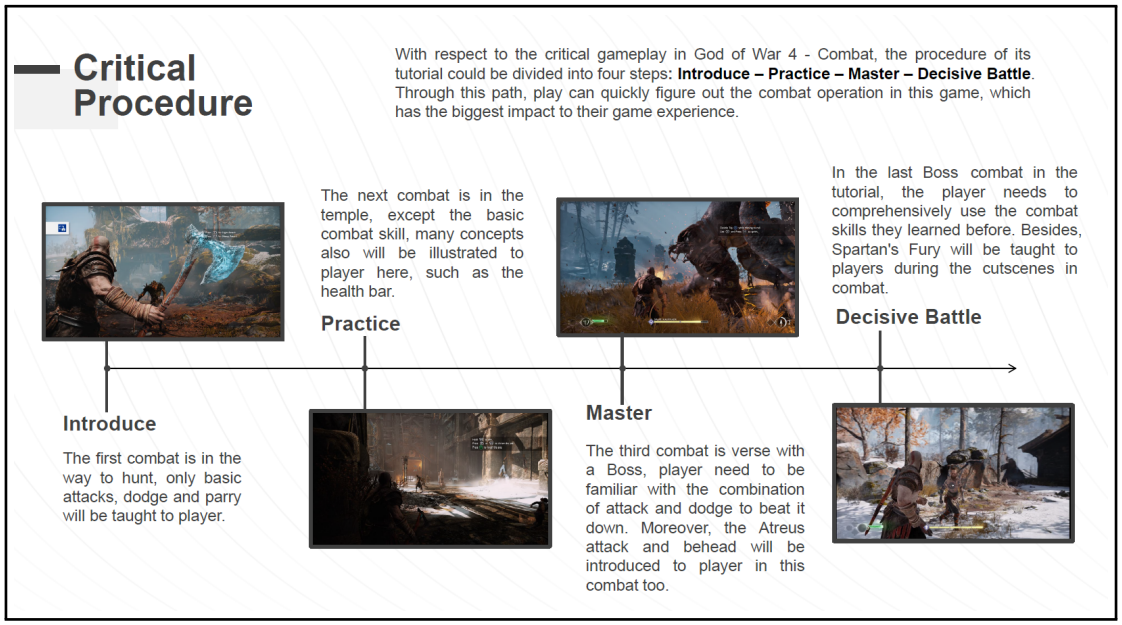


Figure 6.2: Within artifact analysis report: The tutorial procedure of core gameplay in the onboarding of God Of War

Same as the tutorial analysis above, the design elements related to the sense of purpose and sense of immersion were also took into consideration. The questions such as how the onboarding motivates player to play and what the storytelling looks like are something needed to keep in mind when conducting the artifact analysis. Additionally, we also ask ourselves some questions related to players during the artifact analysis. For instance, how will players react? How could they overcome the challenges? Is this specific element appropriate for its targeted audience? Taking those questions into consideration can help us infer and analyze those elements from the player's perspective (Ian, 2009).

In total, the onboarding elements in 8 narrative games were extracted. The collection of artifact analysis reports could be found here (https://drive.google.com/drive/folders/1n6DYkf_YuXwpV214LSwvU2RLWxaLbGmx?usp=sharing), the original report Red Dead Redemption 2 will not be made public according to the confidentiality agreement. Links to individual reports are shown in Appendix A.

In the next stage, an integration that utilized the affinity diagram methods would accept the results in the artifact analysis as input to generating the common design features.

6.2 Affinity Diagram

Affinity diagram is a business tool that can help arrange many pieces of data into manageable groups (Plain, 2007). In business management, it allows large numbers of ideas stemming from brainstorming to be sorted into groups, based on their natural relationships, for review and analysis (Wikipedia, 2021a).

Here we analyzed the extracted game elements through affinity diagrams and integrated their commonalities as the common design features. The results would be used for further analysis in later studies in this project, the procedure and results are illustrated as follow:

Procedure of Affinity Diagram

Step 1: Listing the game features in artifact analysis

The input of the affinity diagram are game features we extracted from the artifact analysis, we wrote each of them down on sticky notes in a Figma (Figma, 2016) file (Figure 6.3). In total 107 game features that are relevant to the onboarding experience were listed in the figure above in the categories of 8 games.

Figure 6.3: The input: Extracted game features from formal analysis

Step 2: Sorting all the features into related groups

- We started by Looking for two features regarding similar topic, place them together and name this group. Figure 6.4
- Looking for other features that are related to this topic and add them to this group.

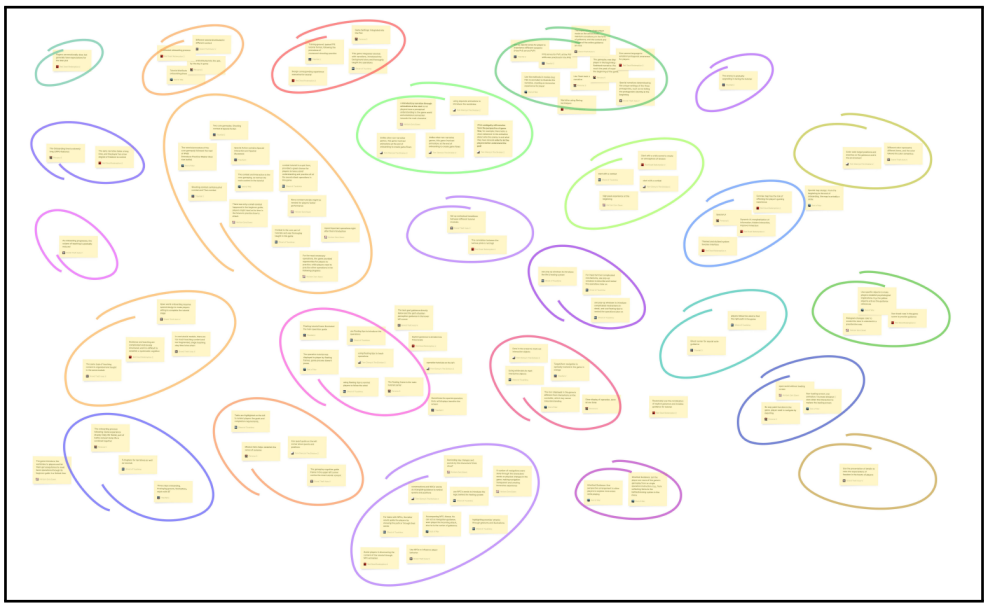


Figure 6.4: level 1: sorting extracted features into related groups

Step 3: Systematize related groups

- Looking for other features that are related to each other and establish and name new groups.
- Adjusting the features and groups till all of the features are in at least one group. Figure 6.5

Figure 6.5: Sorting all the features into related groups

Step 4: Sorting all the groups into related top-level themes

- We Looked for two groups regarding similar theme, place them together and name this theme.
- For other groups that related to this topic we added them to this theme.
- Looking for other groups that are related to each other and establish and name new themes.
- Adjusting the groups and themes till all of the features are in at least one theme.

From the result, ten themes were extracted, their corresponding explanations are illustrated in the following section.

6.3 Results of First-Person Research

This section illustrated the result of the whole first-person research. By the adoption of an affinity diagram, we scrutinize all the findings in 8 artifact analysis reports, encapsulating them into 10 top-level themes, which were the common design features employed in their onboarding phase. They are illustrated as follow:

Theme 1: Employ Explicit Visual Elements for Tutorial

Most games analyzed employ the explicit visual elements to display tutorial content, they remind players missions and operations with simple visual elements or small short text on fixed positions, and leave the rest part on the screen for narrative presentation. For example, Red Dead Redemption 2 (Rockstar Games, 2018) uses the up left corner on the screen to display quests with sort text, and teach operations on the below, and used the right below for reminding the operations. Ghost of Tsushima also used the up left corner for quest information, while used small floating tips on the middle for reminding the operations. Other games analyzed also used similar places on the screen to display such information with a simple manner, maximizing the screen space for graphics, conversations, animations and so on.

Theme 2: Utilize the Player's Subconscious in Various Guidance

In the onboarding, the games tried to provide tutorial and guidance information in ways without interrupting the players' immersion, the methods they used can be categorized into the following:

- Guiding through NPCs (Horizon Zero Dawn, God of War, Ghost of Tsushima)
- Special Colors, e.g. God of War important objects are painted yellow, GTAV (Rockstar Games, 2013) used four different colors to stand for different kinds of interactive items
- Special items, e.g. in Ghost of Tsushima players follow the directions of the wind to find path, Horizon Zero Dawn used special hologram style graphics on interactive objects such as locks

- Guiding through animations, e.g. most of the games analyzed used introductory animation to show the environment and map, or present the protagonist's characteristics and goals to players

Those kind of implicit tutorial methods, referred to Pine, which is called invisible tutorial. Those kinds of tutorials are seamlessly integrated in the gameplay, communicating all the necessary information without using text, patronizing the player or disrupting the flow of the game (Alex, 2019). Through some specially designed items, the player can generate corresponding subconsciousness, so as to learn or realize the operation to be performed.

Theme 3: Integrate the Tutorial into the Narration

Many games analyzed had their tutorial (especially the core gameplay) tied with plots or worldview, set letting players understand and master the teaching content in their onboarding, and polish the stories narration in the tutorials at this phase. GTAV presented its core gameplays (driving and combat) tutorial early in its onboarding phase and set narrative to review the relevant operations. Ghost of Tsushima put the tutorial of its core gameplay (combat) tutorial in a master and apprentice trial to let players learn and master the combat system thematically. Horizen presented its core gameplays (sealth and hunting) tutorial throughout its onboarding to let players have a clear overview of how to play the game.

Theme 4: Divide and Distribute the Tutorial Content Reasonably

Most games analyzed utilized the distributed learning process to thematically organize their tutorial content in the onboarding, the plots were also integrated with this organization, and there is a significant plot transmission between two tutorial parts with different themes. For example, Ghost of Tsushima (Sucker Punch Productions, 2020) divides its onboarding into three parts for teaching different kinds of operations: in the first part, the plot was about Jin Sakai (the protagogist) finding his sword without being noticed by enemies, all the moving and stealth operations were taught in this part together. In the second part, the plot came to Jin learn how to use the sword, all of the combat operations were taught here together. In the third part, Jin came to rescue his uncle from enemies' army, special operations in this game such as standoffs or preventing arrows were taught in this part. Other games such as God of War (Santa Monica Studio, 2018) and Horizon Zero Dawn (Guerrilla Games, 2017) also used similar methods to organize their plots thematically according to the teaching content.

Theme 5: Implement Narration Methods from Other Arts

Most games selected utilized narration methods from other arts, especially the methods from filming, in their narratives to introduce the plots. For example, Ghost of Tsushima, GTAV used intersperse and flashback in their plots to make the narration more understandable, Horizon Zero Dawn and Red Dead Redemption 2 used close up for the protagonist to create sense of substitution for players. Besides, serving

the following chapters, most of the games analyzed set foreshadowing for the plot in their onboarding, leaving the narrative suspenseful.

Theme 6: Provide High Peak Experience in the Beginning

Most games analyzed set a high peak experience through crisis plots, graphic, BGM, or the display of core gameplay at the beginning of their onboarding. Meanwhile, they often render a tense and exciting atmosphere at the beginning of the game. For instance, in GTAV and Ghost of Tsushima, players would experience a fierce combat at the beginning of the onboarding, and in Horizon Zero Dawn players are presented an animation with high quality graphics and epic music of an overview the in game world.

Theme 7: Design the UI Style based on the Tone of Game

Among the games we analyzed, their UI style are both different. In general, they are designed according to the sentiment that the game itself wants to convey to the players. In Persona 5, in order to adapt to the strange thieves and absurd themes of the entire game, this game uses a swell and highly impacted dynamic UI style. On the contrary, the UI of God of War used ancient totems and succinct format to display a calm and restrained style as a whole, which is suitable for the game's Nordic story background.

Theme 8: Bait and Allow Players to Discover Locked Contents

The onboarding phase is focused on presenting the most basic and important plots and gameplays, while the games also provided chances to encourage players to discover more game contents that they will unlock in the future. For example, in God of War, players can find treasures in the onboarding, then they would be able to discover the equipment menus in the game. In Ghost of Tsushima, after players leveled up in the onboarding, they would be able to check the equipment setting and skill setting. And in Horizon, when players fix their weapon during the onboarding, they would have chance to discover the weapon system in this game.

Theme 9: Provide diversified alternatives in linear gameplay

In the game we analyzed, the mission in their onboarding phase is driven by a linear task, while it's up to players to decide whether they follow the instructions or not. For example, Horizon Zero Dawn, Ghost of Tsushima used linear tasks and plots in their onboarding, while players can decide whether to complete these tasks by following the stealth way that the instructions provided, they are free to discover and try different ways like an onslaught to complete these tasks. In the God of War, players are unfettered to choose whether just follow the NPC and complete the main task or freely explore the map and discover the special collectibles.

Theme 10: Let Player Establish Empathy towards the Protagonist

Most selected games put great efforts on introducing the protagonist to players. the Red Dead Redemption 2 gave a lot of exposure for its protagonist in the plots during its onboarding, Horizon Zero Dawn used the whole narrative in its onboarding to introduce the protagonist's growth, trying to introduce the protagonist in detail and let players develop a sense of empathy towards the character. But there is an exception, GTAV, which have more than one main characters players can control, tried to avoid spending significantly more time on one main character than the others during its onboarding.

7

Execution | Empirical Research

The second part of this project is to conduct an empirical research, which obtains empirical qualitative data from real users of narrative-rich games through a series of user tests. This chapter will illustrate the preparation and execution of empirical research, which constituted by the user test as well as the data handling and its corresponding results.

7.1 Environment and Participants

A serious of user tests was conducted to complete the empirical research. The user tests were done in a home environment, in order to simulate the real gaming context. Based on the result of the first-person research, God of War was select as the test game, which contained most of the common features extracted. God of War (Santa Monica Studio, 2018) is produced by Sony's Santa Monica Studios, a third-person action role-playing game released on April 20, 2018. This game is the orthodox sequel to God of War 3, but there is no serial number, which also represents the restart of the series. Unlike God of War 3's ACT gameplay, which only focuses on violent combats, God of War is positioned as an ARPG genre with an abundance of narrative content. IGN comments that "God of War is a masterful composition of exceptional interlocking parts, deliberate in its design and its foreshadowing, which pays off in unexpected ways in both the gameplay and story" (Jonathon, 2018). Therefore, through user testing on God of War, we can collect qualitative data from players in the onboarding phase of such narrative-rich games, so as to articulate the aimed design guidelines with the result from first-person research together.

A total of 12 participants were involved in this study, among them, 10 who identified as male and 2 who identifies as female. The recruitment work was conducted by posting recruitment information in several Chinese-in-Sweden WeChat groups, then screening 12 participants who met the test conditions through simple one-to-one interviews on WeChat. The participants were Chinese players between 23-27 with experience of console games, all of them were kleenex testers who have no experience on the God of War before in order to let the onboarding influence their first experience to the games. To avoid the results biased by participants with certain personal preferences or experiences, the participants recruited had different game experiences as well as different extent of sensitivity about narration while playing games. Based on the level of game preference and interest towards the narratives, the participants were segmented into four types and categorized into three groups:

Table 7.1: Participants Segmentation

Groups	**Core Group**		**Secondary Group**	**Marginal Group**
Number	3	4	3	2
Type	Type 1	Type 2	Type 3	Type 4
Game Preference	Wide range of games	Hardcore to RPG	No requirement	RPG novice
Narrative Sensitivity	High	High	Casual	No requirement
Platform	With experience on console games			
IP	No IP experience, Kleenex testers			
Demography	Chinese, the young older than 17, males >females			

As shown in the table 7.1 above, the participants were grouped based on their game preferences and narrative sensitivity. Two types of players are classified as the core group of God of War. They both have high sensitivity to the narrative elements in the game. One kind of player is the hardcore of RPGs, and the other has experience in wide types of games. Such players themselves have experience in RPG games, and are very interested in the plot provided by RPG games, so they have a great possibility of having a willingness to retain after onboarding. The secondary groups are all players who are not sensitive to the narrative elements in the game, and we did not make requirements for their game preferences. Such players may have a willingness to retain God of War due to non-narrative factors such as gameplay, collection achievements, or character actions. Players in the marginal group are players with less experience in RPG games. Such players may encounter difficulties in basic operations, making it difficult to have the willingness to continue playing with God of War, so their narrative sensitivity is not required when screening.

7.2 Procedure

The protocol of user test could be found in the Appendix B. 12 user tests were held in total. Each user test consists an observation session and an semi-structured interview session. For each Participant, they were first informed the overview of this test and signed a data processing agreement document(see Appendix C). Then a small interview regarding their demographic information and game experience was held for ice-breaking. Afterwards, participants were then informed that they were going to be observed and recorded playing the onboarding chapter, and an interview about their feedback would be conducted in the next session. In the first session, the researchers observed the participant playing the onboarding chapter of God of War. The participant was required to complete the onboarding phase by themselves with the screen recorded, instructions and interruptions from the researchers were reduced as possible and the participant was allowed to freely explore the onboarding phase of this game. The researchers observed and took field notes about participant's special behaviors during the observation. In the next session, researchers firstly asked the participant about the overall feedback regarding sense of mastery, sense of purpose and sense of immersion. Then the researchers viewed the record together with the participant together, during which the researchers asked questions regarding special behaviors noted during the observation, and the participant were encouraged to point out what they thought good or bad in this onboarding and explain the reasons.

7.3 Data Analysis

When doing data processing work, we merged two qualitative data sources to analyze data more systematically. Participants' screen was recorded during the observation, and their special behaviors were noted in text, these two data sources were integrated into the following semi-structured interview session in order to attain both overall and detailed feedback from participants' experience. The interview lasted 20-40 minutes, including collecting the participant's overall feedback regarding sense of mastery, sense of purpose and narrative immersion, the participant viewing and reflecting on the record, and discussing their onboarding experience with the researchers. Then the key information was and transcribed into a text data set with 371 critical extracts of participant statements after preliminary analysis and screening. After that, we employed thematic analysis to map the different declarative information of the participants to the in-game design features, and make a higher-level summary based on the functions of these in-game design features.

7.4 Findings of Empirical Research

Here we illustrated the finding of empirical research. Our analysis of the data has integrated into 3 themes. These themes are in line with defined onboarding criteria in section 3.2 that affected different aspects of participants' experiences in the onboarding phase of the narrative-rich game.

7.4.1 Findings related to Sense of Mastery

Sense of mastery, as the name suggests, is the player's proficiency in the operation of the game. The onboarding phase with high teaching effectiveness can help players to learn the game operation and gameplay smoothly, so that they can continue the game with confidence. The data suggests that when participants experience the onboarding phase of God of War, the following design features will affect the sense of mastery of the participants.

- The Combination of the Explicit and Implicit Guidance

Part of the tutorial content in the onboarding phase of God of War uses a combination of explicit guidance and implicit guidance. The explicit guidance in the tutorial is the elements that are directly displayed to the player. On the contrary, the im-plicit guidance is the elements that are invisible on the screen but allusively provide the guidance to the player. For example, the puzzle-solving stage in the God of War utilises visual elements and prompt guide frame as explicit guidance, meanwhile take NPC dialogues and color changes of item as implicit guidance. Ways to guide players to solve puzzles and help players build puzzle-solving ideas. The figure 7.1 illustrates the combination of explicit and implicit guidance in puzzle-solving stage.

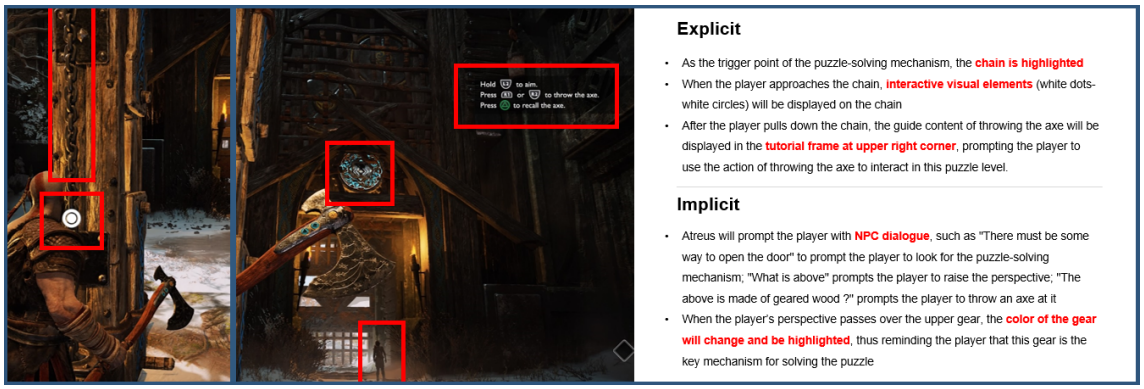


Figure 7.1: The combination of explicit and implicit guidance in puzzle-solving

In the test, most players (N=11) could perceive the puzzle-solving tutorial content by this combination of explicit and implicit guidance, their learning paths are illustrated as follow:

1. Players heard the prompt in NPC's dialogue "There must be some way to open this door", then players realized that they need to find the puzzle solving mechanism. (Implicit)
2. Players found the highlighted hinge and the intractable UI element on it, then they knew it's the needed mechanism. (Explicit)
3. Players noticed the left-up corner on the screen occurred a prompt frame of how to throw the axe, then they took out the axe for aiming something. (Explicit)
4. Player heard the prompt in NPC's dialogue again "What's that up there?", then they raised their perspective. (Implicit)
5. Player noticed the color changing when their perspective passes through the gear on the door, so they throw the axe toward the gear. (Implicit)
6. Player saw the prompt frame with guidance of how to retract the axe, then they just followed this instruction and retract the axe to open the second gate. (Explicit)

In the interview, all of the participants who successfully solved the puzzle (N=11) stated that they followed the above-mentioned path and were able to find hints from explicit or implicit guidance in a few specific steps. All participants who succeeded in solving the puzzle at this stage can quickly think of taking out the axe and searching for the critical mechanism in the next puzzle-solving stage. From this, it can be concluded that they have successfully received the puzzle-solving tutorial content in the onboarding phase.

- UI Elements with Low Visual Impact

As a narrative-rich game, God of War adopts the design strategy of weakening the visual impact of its UI elements. One example is that the player's HP bar and MP bar would be hidden when it is not in combat. Other examples such as hiding and shrinking the UI at the trigger point, fading the beam on the collectable item.

Figure 7.2: The comparison of different UI visualization in God of War

This design of sacrificing the impact of visual elements has caused many problems. In the test, when players notice the white concentric circle, some of them (N=7) didn't know what the white circle is, and they could not immediately establish a connection between this visual element and the red circle icon on the controller. Similarly in the test, because the light beam of the collectibles was diluted, many participants (N=8) mistakenly believed that the light beam was part of the map object, which resulted in the missed collection and the inability to form the awareness of collection and exploration. As a comparison, the HP medicine is set as a bright green beam, which can be identified and collected by all participants in the test. This kind of design strategy can maximize filming sense of the game. Combining with realistic picture quality, it can provide players an immersive game experience, helping players to better receive narrative transmission and let player fully emerged into the plot. But correspondingly, the receivability of this visual element will be reduced, which would make player miss some collectable items and intractable plots, which eventually damage the sense of mastery and sense of purpose.

- Beforehand Contextual Tutorial

For narrative-rich games, the tutorial content cannot be separated from the plot. To complete the narrative and tutorial at the same time within the limited onboarding time, it is necessary to use contextual tutorial which integrate the tutorial content into the plot and narration. In God of War, in addition to the simple and standard contextual tutorial (teaching the jump on the broken bridge, teaching the Spartan Rage ability when angry), this game also designed a small plot to warm up the player before the introduction of a new operation, we called it beforehand contextual tutorial. For instance, the figure below showed two example of this beforehand contextual tutorial. The left is pressing the attack button and swinging the axe to chop the tree, the right is aiming and pressing the square button to shoot the deer.

In the test, all the participants (N=12) expressed their praise for this form of tutorial. Through interview and thematic analysis, their positive attitudes were derived from two aspect. One the one hand, it could introduce the new operation concept in advance, giving players a warm-up attempt. one participant claimed that "Here let me form a kind of muscle memory in advance, and then I only need to take a glance at teaching frame later", this statement illustrated the positive function of

this kind of tutorial from the teaching effectiveness perspective. Another participant analyzed this beforehand contextual tutorial from the teaching content point, stating that "The archery section not only tells me that children can shoot arrows, but also tells me that I can let children aim and shoot arrows". On the other hand, the beforehand contextual tutorial could enrich the image of the characters and use the small plot in the context to convey the narrative content. many participants (N=4) maintained that they could feel the old-fashion father image from the plot of teaching child to shoot arrows hand in hand.

Figure 7.3: The beforehand contextual tutorial in God of War

- Interrupted Pop-up Tutorial Box

The interrupted pop-up tutorial box will suspend the player's game flow and make the game forcibly pause, so as to focus the player's attention on tutorial information displayed in this pop-up box. In the onboarding process of God of War, the interrupted pop-up tutorial box appeared three times in total. In the test and interview, participants gave three total different attitude to the three interrupted pop-up tutorial boxes contained different information.

Figure 7.4: Three Interrupted pop-up tutorial box in God of War

The first interrupted pop-up tutorial box appeared in the temple (the second combat tutorial). The content in the box is very simple, only telling the enemy that the life bar is above the enemy's head as the figure above illustrated in the left. All participants (N=12) think that this interrupted pop-up tutorial box here is unnecessary,

and most participants (N=11) close it after just one glance during the test. During the interview, the participants (N=12) stated that this type of teaching content is too simple and there is no need for interruption; among them, several players (N=3) said that this interrupted pop-up tutorial box should appear before the first fight, not the second. All players indicated that the second interrupted pop-up tutorial box was acceptable, because a new concept was introduced, in which individual participants (N=2) indicated that the interruption before fighting the boss can relieve them from facing the BOSS for the first time. The tension before, increase confidence. Most of the participants (N=10) claimed that they did not understand the content of the third pop-up box. In the interview, they said that too much text and too many new concepts (even they are related concepts) made they can not successfully understand the tutorial content of this pop-up box.

- Positive Experience Transfer

Learning transfer refers to the influence of one kind of learning on another kind of learning, or the influence of acquired knowledge and experience on the completion of other activities, and positive experience transfer is one kind of learning transfer. Specifically in the field of game, it refers to the impact of concepts in similar games or basic common sense concepts on learning in the game tutorial. Using positive experience transfer can reduce unnecessary tutorial content and the learning burden of players.

God of War also utilized a lot of positive experience transfer for tutorial, such as the transfer of color semantics as the left figure showed above, all participants (N=12) can semantically link "green=recovery" and "red=danger" without reading the instructions carefully, so as to master the use of blood medicine and observe the upcoming attack beacon. Another example is using the general body language for narration. God of War applied common narrative techniques in movies, novels and other arts, and uses more general body language to narrate, which is conducive to players' understanding of the plot and enhances the sense of empathy. For example, in the middle figure illustrated above, the protagonist wanted to pat his son to comfort him, but ultimately did not take that movement. Most players (N=11) said that they feel like the protagonist was an old father who doesn't know not express love. However, the positive experience transfer also risks of use in some stage. As an ARPG, operations that often appear in similar games were not taught in God of War's onboarding. For example, there is no special tutorial on the important "Shield Parry and Hit Recover" in combat. For hardcore RPG participant, after learning about the shield blocking button in the test, they would take the initiative to find opportunities to active the shield parry, but for non-hardcore participant, unless they were lucky to active the shield parry, they won't know the gameplay of "Shield Parry and Hit Recover" until the end of onboarding phase.

7.4.2 Findings related to Sense of Purpose

Sense of purpose, on the one hand, is a goal that can provide continuous self-motivation (for example, being curious about the plot, wanting to collect all items),

on the other hand, it is also knowing how to complete this goal (for example, knowing how to complete the main task). By experiencing the onboarding phase of God of War, most players have established their sense of purpose. In the interview, the players stated that the following design features will affect the establishment of their sense of purpose.

- Inherited Guidance

In the test, when the participant is about to start hunting, most of the participants (N=7) could find the toy boat on the way. The toy boat is a collectible item in the "lost and found" system. When the participants picked up the item, related information would pop up on the right side of the screen and reminded the participants to view more item information. If the participants open the menu interface then browsing the different menu module from left or right, the participants would see the protagonist's equipment, weapon upgrades, skill upgrade previews, maps to explore and more menu pages in it. In this way,participants could see the high playability and development potential of their character without additional guidance. We called this kind of guidance flow - inherited guidance. The inherited guidance could show the unlocked content in advance, which help players establish a sense of purpose.

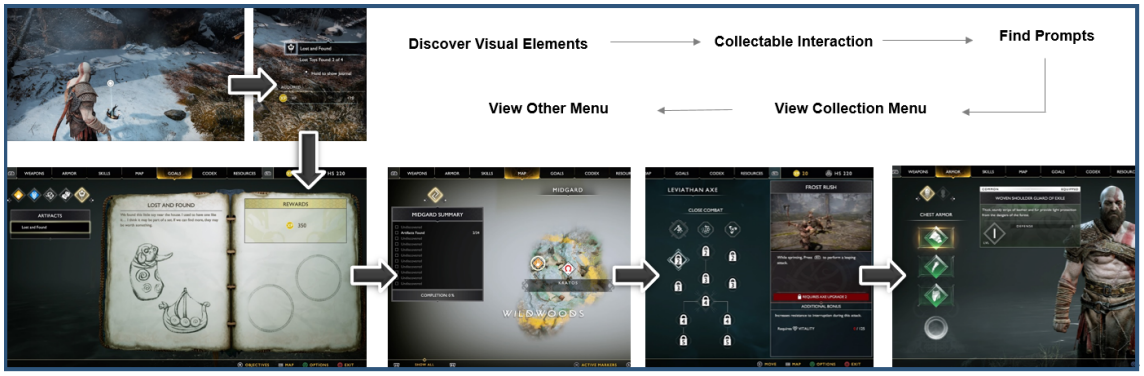


Figure 7.5: The inherited guidance flow in God of War

Ideally, players can interact with a single collection to complete the traversal of the menu and understand the potential gameplay of the game, so as to establish the sense of collection, upgrading, enhancement, exploration, etc. relevant sense of purpose. But in the actual test, even if most participants (N=7) could complete the collection interaction, only a few (N=5) players can open the menu to view according information of this item, and very few participants (N=3) could complete the traversal of the menu, only a few participants (N=2) in the interview indicated that they could form a sense of purpose through this process. Through interviews, we sorted out several reasons for the failure of inheritance guidance:

1. The "collectible information is useless" experience transferred from other RPG games.
2. There are too many texts and the participants didn't want to view it.
3. There are too many guide frames on the right (Lost and Found and Acquired appear at the same time)

4. The key guide to open the menu bar is too small, participants didn't want to see it carefully.
5. When the guidance appears, the NPC has already left, and there is a voice urging, afraid of being lost.
6. When traversing the menu, the upper column display is too small, and no mandatory guide to traversal it.
7. When traversing other menus, there are too many operations (left/right joystick, up, down, left and right buttons appear at the same time).

- Invalid Navigation

In the tests, there were three kind of contexts where participants were likely to get lost: Participants easily got lost when the UI elements for navigation were not obvious. In "God of War", in order to maximize the sense of immersion, the UI elements were reduced as much as possible, resulting in many visual elements that are not obvious. For example, in the story of going home, the white dot marking the door seems hidden when seen from far away, when the NPC stopped moving, some players (N=5) appeared to be unsure of what to do next because they did not find the door.

Participants felt unsure about where to go without following the NPC. As an important NPC, Atreus has always provided the role of leading the way during the novice guidance stage. However, many participants (N=7) appeared to explore the game only by following the NPC instead of on their own, they could get lost when they can not find the NPC. "NPC has left and feared to be lost. and give up exploring more in the environment." (P1) "I was intended to choose the right road but the NPC went to the left one, so I just followed him." (P8) This kind of over-guidance of NPC will cause the player to follow the NPC only, and cannot form the consciousness of exploration and collection.

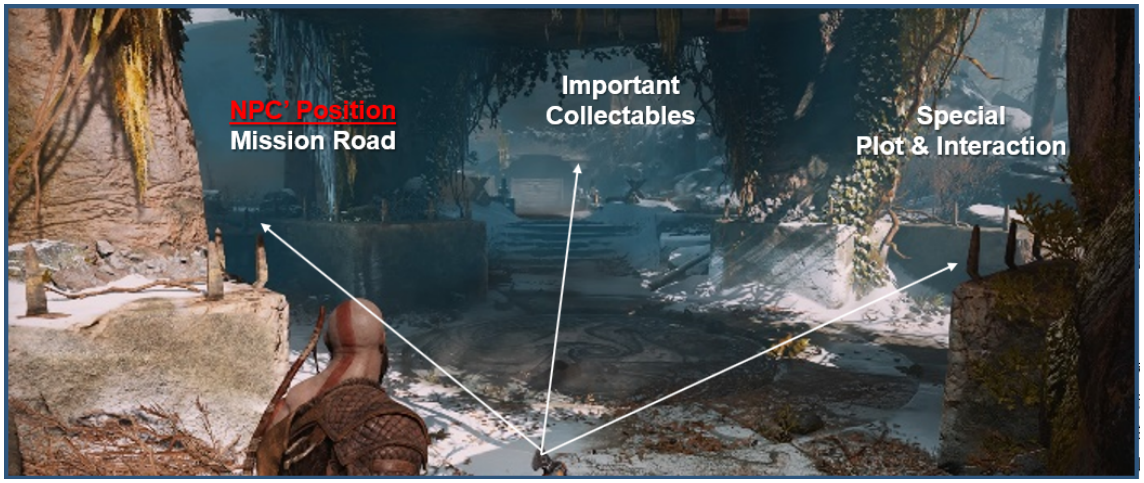


Figure 7.6: Players rely too much on NPCs, so other routes are not explored

Participants felt lost when the game gave control to them at wrong time. In the test, after the second battle with the stranger and the cutscene ended, many participants

(N=6) were unable to find their way. The reason for this phenomenon is that the road after the animation ends is still surrounded by the smoke effect, but the participants were already given the control at that time. Many players mistakenly believe that there is no way in this direction after glancing at the smoke, so they pull their perspective to the left and move forward. Eventually lead to getting lost.

- Non-playable Character (NPC)

Most of the participants (N=12) in the test were aware of the help from NPC. In the onboarding phase, Atreus as a follower NPC, often acted as a guidance for novices. One participant said: "I have a sense of being guided, and in the plot, the child is asked to find a deer, so it naturally feels like I have to follow the child, let alone that he was walking in front of me." (P2) Other participants also mentioned they got useful information about what to do from the NPC: "The child said the axe is not working to this kind of enemies." (P4) "I can find the right direction of the main quest by following the NPC." (P8) (P9) " Besides, NPC can also contribute to tutorials or plots, thereby influence players' sense of mastery and sense of immersion: "the NPC gave me hint after I failed many times in the puzzle solving." (P3) "The question the son (NPC) asked the main character was also what I was wondering." (P10)

7.4.3 Findings related to Sense of Immersion

When players experience a narrative-rich game like God of War, they must understand the plot and establish the empathy into the story. This requires that the onboarding phase of the game must be able to attract the player's attention, so as to better convey the narration to the player. Hence, whether the game can provide players with a sense of immersion is very important for the onboarding. Most of the participants mentioned they felt immersed in the game while experiencing the onboarding, according to their feedback, their senses of immersion were created or influenced by the following design features.

- Cinematic Narrative

The God of War adapted an one-shot lens method in its onboarding, there is almost no abrupt pauses or jumps through the whole onboarding, mandatory loading were finished invisibly behind short cutscene animations such as riding a boat or opening a door. This one-shot method can maintain the continuity of the player's game experience, thereby enhancing the understanding of the game story and the substitution of characters. One participant said "this game can be directly played, there is no loading icons on the screen, which is quite seamless and makes me feel immersed."

Figure 7.7: The non-loading game flow in God of War

The game added suspense in its narrative through a large number of dialogues between characters, which can capture participants' attention and make them become immersed in thinking about the plots. As a participant mentioned in the interview: "I don't quite understand what the god of war did in the past, but I can feel that he has hidden a lot of things without letting his son know. Many of the questions his son asked him during the trip were also the ones I was curious about." (P6) Another participant said: "This stranger has been asking what God of War is hiding, which makes me very curious. I want to go home and buy this game and continue to watch the plot."

The game also used a variety of expression methods (e.g. side description, contrast, foreshadowing, portrayal, etc.) to influence players' emotion in the onboarding phase, these diversified narrative methods enabled the plot to be abundant to the players, helped the player to form a sense of substitution for the protagonist, and left a deep impression on the player in specific moments. In the interview, most players (N=9) said that there are two impressive plots in the entire experience: one is the giant monster that suddenly appeared in the quiet atmosphere. This contrast between quiet and fright made the participants unforgettable. The other is the provocation of the stranger (the boss), after pretending being weak and being knocked to the ground by the player, he punched the player into the air. This kind of character portrayal quickly captured participants' attention and made them developed a deep impression towards the boss.

- Interactive Cutscenes

In "God of War", there is only a non-interactive long animation in the entire onboarding phase, and the rest of the cutscenes are interspersed with interactive actions to allow the player to participate in the control of the character instead of putting down their handles to become the audience. Most players (N=11) expressed their love to it. As one participant explained:" these cutscenes allowed me to control the character instead of just standing by, which provided me a strong sense of participation, I have never had such experience in other games." (P10) However, in the test, some participants had problems in judging whether a moment in a cutscene is an animation or an interaction. For example, in the long animation without interaction, when the camera returned to the over-the shoulder perspective, a few participants misjudged this as an interaction. And in another interactive cutscene, the camera returned to the over-the-shoulder perspective, but the main character's panting action made the participants mistakenly believed that was an animation.

8

Guideline Generation

Here we illustrates how we integrated the results from first-person research and empirical research by inductive analysis and generate the aimed design guidelines.

8.1 Inductive Analysis

Through first-person research and empirical research, we acquired two qualitative data results, one is derived by the experience and knowledge of researchers themselves, the other is obtained by a series of user tests that involved the real players. These two results are complementary to each other.

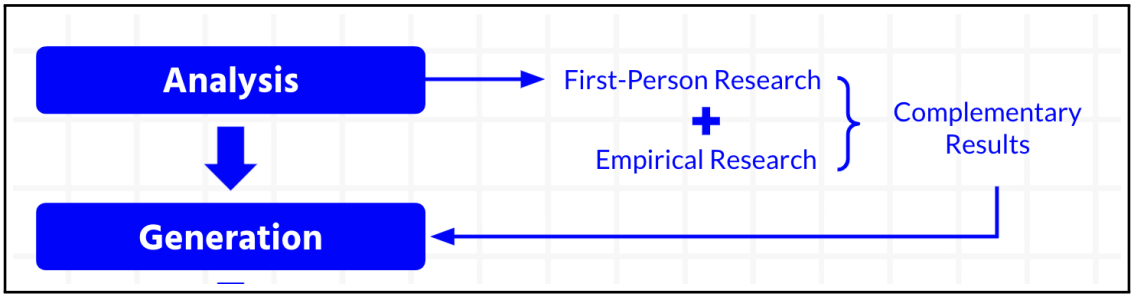


Figure 8.1: Generating guideline through two complementary qualitative results

Here we utilized the inductive analysis to integrate and analyze these two qualitative data results. Thomas introduces a general inductive approach for analysis of qualitative evaluation data (Thomas, 2006). As Thomas illustrated, we expected to "condense extensive and varied raw text data into a brief and summary format", "establish clear links between the research objectives and the summary findings derived from the raw data" and "develop a model or theory about the underlying structure of experiences or processes that are evident in the text data" by the way of inductive analysis.

Step 1: Input

Thomas suggests that the first and second steps of inductive analysis are "preparation of raw data files" and "close reading of text" (Thomas, 2006). Here we input the two text results into the Figma (Figma, 2016), preparing these qualitative data sets for the following analysis. Figure 8.4 below illustrates the the intake of inductive analysis.

Figure 8.2: Input two qualitative data sets into Figma

Step 2: Equalizing Hierarchy

As Figure 8.4 illustrates, the result in first-person research was displayed into 10 different themes, while the empirical research result was categorized into three higher-level themes. In order to make the two qualitative results more conducive to inductive analysis, we downgrade the results of the empirical research, and split the two sets of results into a total of 20 separate theme modules.

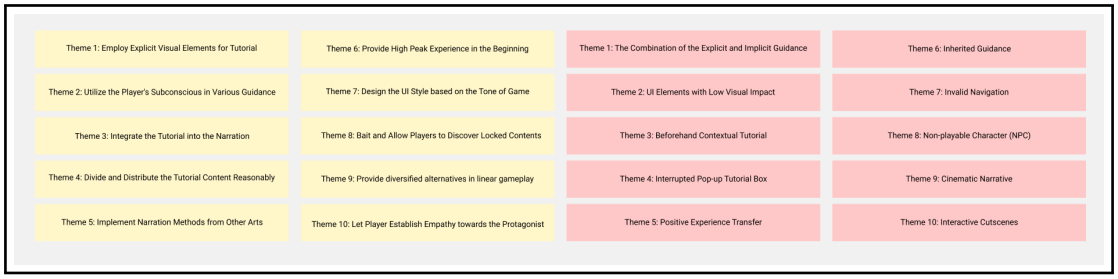


Figure 8.3: Downgrade empirical research result and split two sets of results into 20 separate modules

Step 3: Combination and Categorization

The third step that Thomas introduces is "creation of categories". Thomas suggests the evaluator should "identifies and defines categories or themes" (Thomas, 2006) for their qualitative data. Based on their more detailed explanation in the thesis previously, here we will arrange and combine 20 theme modules and try to find commonalities or characteristics that are more in line with the onboarding experience. During this step, we found that some theme modules can stand out as a single category, while some modules can be combined with other theme modules

to be classified into multiple categories. Thomas maintains that this condition is common and acceptable. Thomas argues that "one segment of text may be coded into more than one category" and "a considerable amount of the text may not be assigned to any category" are the typical rules that are different from quantitative analysis. Thomas also defined this kind of "overlapping coding and uncoded text" as the step 4 in his inductive approach. In the end of this step, a total of 16 categories were formulated.

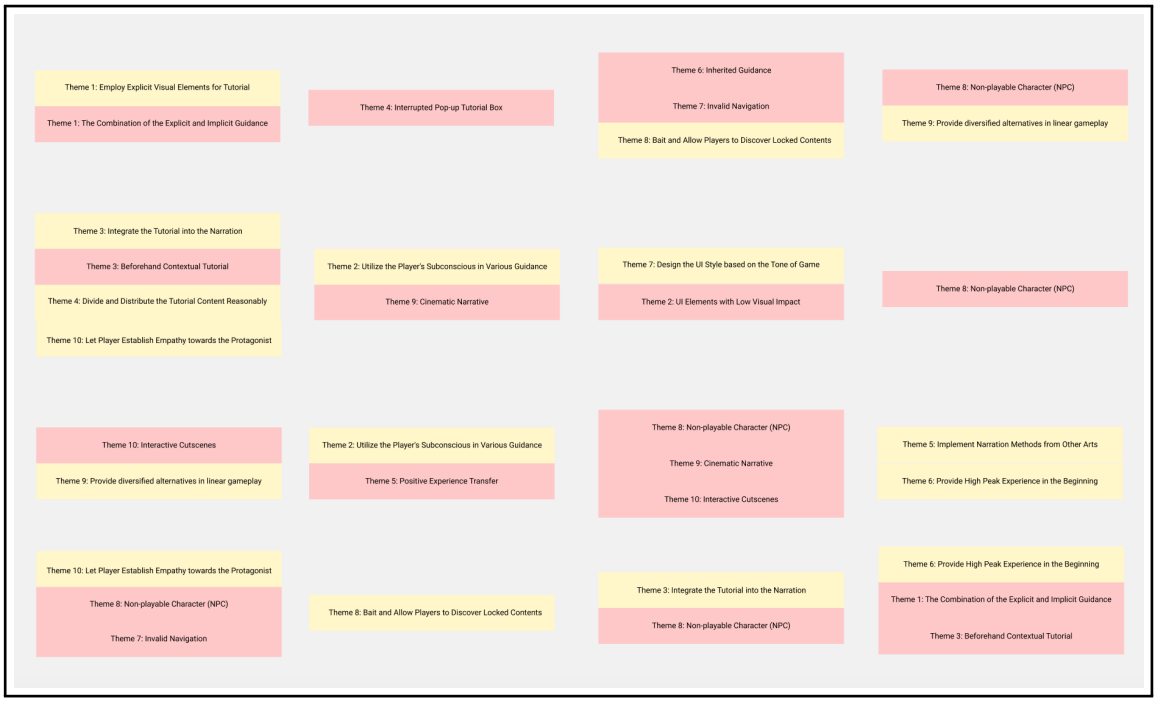


Figure 8.4: 16 formulated categories after combination and categorization

Step 4: Generating Guideline

Thomas claims that the last step for inductive approach is "continuing revision and refinement of category system", which requires researchers to "select appropriate quotations that convey the core theme or essence of a category" (Thomas, 2006). In this step, we refined our categories, and excluded 4 categories that had less impact on the onboarding experience or were less relevant to the aim. The remaining 12 categories were selected as output design guidelines after quotation selection and remastering. The guidelines will be illustrated in the following chapter 9.

9
Results

In this chapter we illustrate our onboarding design guidelines. We utilized inductive analysis to associate the results in first-person research and empirical research. These two complementary results could provide us a niche approach in generating guidelines. In the guidelines structure section we demonstrated the presentation format of our guideline, which is in line with the design-practical form Mueller and Isbister introduces (Mueller & Isbister, 2014). In the guidelines presentation section, we presented our guidelines in card form, and illustrated their motivations correspondingly.

9.1 Guidelines Structure

We extracted twelve guidelines in total, each guideline contains five parts:

- (a) A short title generalizing what the guideline is to make it easy to read and remember.
- (b) A few tags illustrating the relationship between the guideline and the three criteria: sense of mastery, sense of purpose and sense of immersion.
- (c) A description explaining the content of the guideline.
- (d) One or more example(s) of implementation introducing the guideline in practice.
- (e) DOs and DON'Ts pointing out things should be paid attention to in the guideline.

All of the guidelines were driven by complementarily combining the insights from the artifact analysis and qualitative feedback from participants in the empirical research. We formed the language and visualization of each guideline in a way we hope to make it easy to read and understand for developer groups including both game developers and people with diversified backgrounds. In the following sections we present the guidelines and the motivations.

9.2 Guidelines Presentation

In this section we present the guidelines, the guidelines were made in the form of a card booklet, each guideline includes descriptions and examples in order to make it easy to understand and utilize in design practice. In order to maintain aesthetics and readability of this section, three guidelines were illustrated in one page, and the

caption of these figures were eliminated. The onboarding design guidelines exhibition is as follow:

Example of implementation

In God of War, the game used a combination of guidance to help players solve the puzzle.

Combine the explicit and implicit gudiance for better mastery.

`# sense of mastery`

It is necessary for narrative-rich games to organize several guidance in their onboardings to explicitly or implicitly provide tutorial information. Here we illustrate a general model of a guidance combination:

- *Use overlay UI elements to remind operations and quests.*
- *Highlight interactive objects in the environment with special visual features.*
- *All of the features should be modeless in order not to interrupt the immersion.*
- *When possible, also consider use NPC's words or behaviors as reminders.*

Dos and Don'ts

- Do make sure tutorial information is clear and easy to read.
- Don't need to stick to the model provided, changes according to different contexts are acceptable.

Example of implementation

In God of War, players indicated the green light beams on the medicine were easy to find in the game, while the white light beams on the collectable objects were diluted in the environment, which negatively affected them to build a sense of collection in the game.

Do not over weaken the visual impact of UI elements.

`# sense of mastery` `# sense of immersion`

Keep a minimalism style UI can maximize the filming sense of the game. But when using overlay UI elements to display tutorial content, make sure these elements are visually obvious enough on the screen so that players can understand them immediately. UI elements with too low visual impact can easily make players feel lost, hence interrupt their immersions.

Dos and Don'ts

- Do keep a balance between functionality and aesthetics.
- Don't use visual elements which looks not obvious in the game environment if you want players to see them.

Example of implementation

In Horizon Zero Dawn, the game taught players how to search collectables from dead monsters in the context of first hunting, the context ont only provide players chances to learn by doing but also promote the following plot of making arrows.

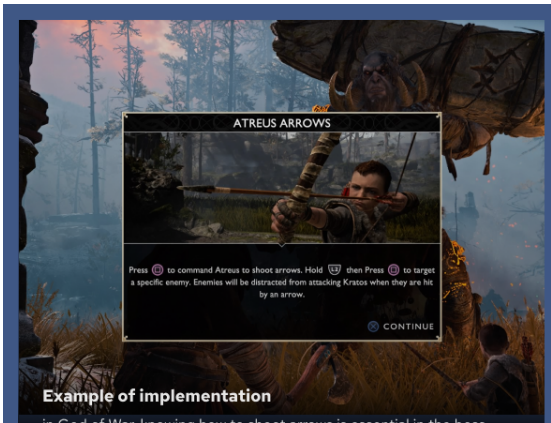
Integrate tutorials with contexts for better mastery and immersion.

`# sense of mastery` `# sense of immersion`

When teaching operations and introducing plots at the same time, consider integrate tutorial content with narratives to leave players deeper impressions on both operations and narratives.

Dos and Don'ts

- Do add meanings and contexts to let players learn by doing.
- Don't make the meanings or contexts implicit. (See guideline 11)



Example of implementation

in God of War, knowing how to shoot arrows is essential in the boss fight, the game introduced this concept with simple text and visualized demonstration before starting the first fight with a giant monster in the onboarding phase. Players indicated this tutorial was clear and helpful, and the interruption it caused relieved them from facing the BOSS for the first time.

Carefully consider the content and timing of interrupted tutorial.

sense of mastery # sense of immersion

When using modal elements for tutorials, carefully consider the content and timing. Pop-up windows containing not clear or unnecessary information can be disturbing.

Dos and Don'ts

- Do consider use modal feedback only when necessary (e.g. the information is important or complicated), make the text part short and clear, consider use figures or other methods to visualize the information.
- Don't use this method for information which are not important or not needed right after, reduce the text and concepts involved as possible.

Example of implementation

In God of War, the game uses green for medicine and use red for blood, letting players understand the recovery system without explaination.

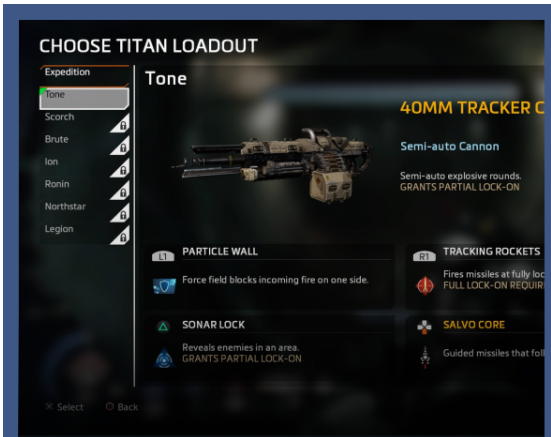
Utilize player's existed knowledge to reduce learning burden.

sense of mastery # sense of immersion

Previous knowledge of players could help them in learning a new game through positive experience transfer. Using common features or operations can reduce the volume of tutorials, and using common expressions can reduce implicitly in narratives.

Dos and Don'ts

- Do reduce players' learning burden by using conventional features or operations.
- Don't add unexpected implicities to players in the onboarding.



Example of implementation

In Titanfall 2, the game provided chances in its onboarding to let players check the locked advanced weapons, showing players the rich potential content in the game.

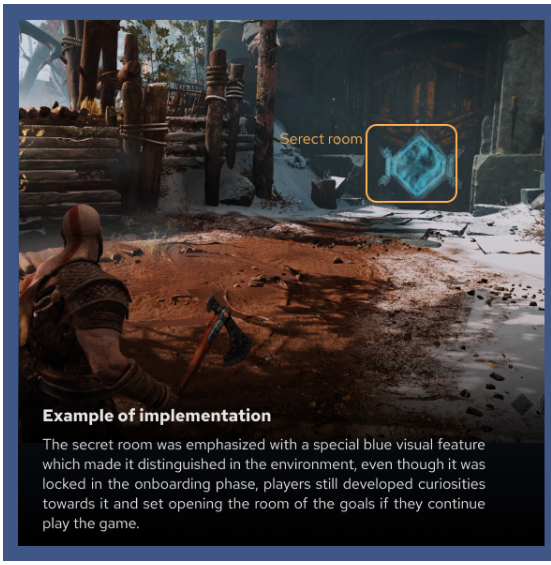
Display the locked content in the early stage.

sense of mastery # sense of purpose

Content which are locked but fun, such as advanced weapons and undiscovered abilities, should also be shown in the onboarding phase to raise players' expectation to the game.

Dos and Don'ts

- Do raise players' expectations to the game by showing how much they can explore in potential.
- Don't make the chances to explore the locked content seems diluted in the environment. (See guideline 7)



Example of implementation

The secret room was emphasized with a special blue visual feature which made it distinguished in the environment, even though it was locked in the onboarding phase, players still developed curiosities towards it and set opening the room of the goals if they continue play the game.

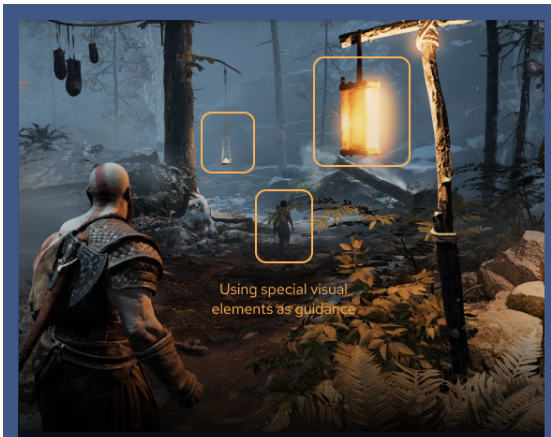
Visually emphasize important things in the environment.

sense of purpose

Providing a visual hierarchy can guide players' attentions, help them form a sense of purpose. Important or interesting content should be visually emphasized in the environment if you want players to explore them.

Dos and Don'ts

- Do design important objects with a high visual hierarchy in the environment.
- Don't make explorable or interactable objects not obvious in the environment.



Example of implementation

In God of War, players relied on NPC and yellow objects to find the right direction in the environment.

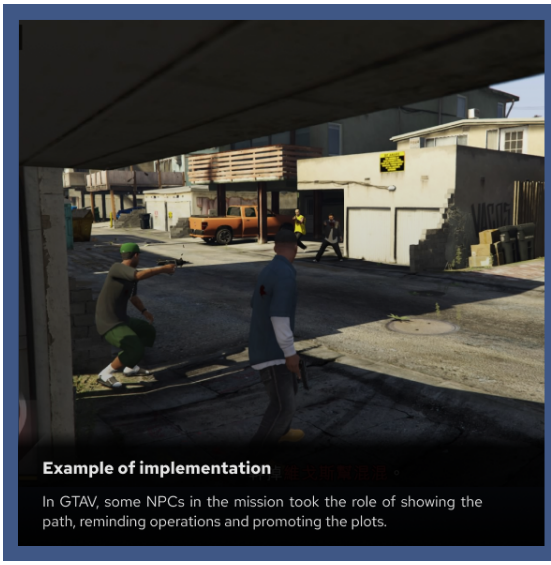
Imperceptibly assist player in pathfinding.

sense of purpose # sense of immersion

Players rely on visual signs to find the right path, setting special objects in the right direction can prevent players from getting lost, hence increase snese of purpose and sense of immersion.

Dos and Don'ts

- Do set visual signs to guide players on the right path.
- Don't let these signs appear at where they shouldn't be.



Example of implementation

In GTAV, some NPCs in the mission took the role of showing the path, reminding operations and promoting the plots.

Set an NPC accompanied the player in the onboarding.

sense of mastery # sense of purpose # sense of immersion

A follow-up NPC accompanied with players can remind players of how to operate during specific teachings, guide players forward in the right direction, and complete the narrative of the plot through dialogues with the players' character.

Dos and Don'ts

- Do make use the follow-up NPC if players would have one in the onboarding.
- Don't let the NPC stand by when players need help.

Example of implementation

In God of War, instead of letting players standing by and watch, the game set a few interactions in the cutscenes to invite players take part in it, compared to cutscenes with pure animations, players felt more sense of participant with the ones with interactions.

Interactive cutscenes are better than cutscenes with long animations.

`# sense of immersion`

Compared to using long animations, making long cutscenes interactive can maintain players' attention and immersion.

Dos and Don'ts

- Do add interactions in cutscenes to maintain players' attentions if it contains long animations.
- Don't purely use long animations in cutscenes.

Example of implementation

Persona 5 utilized flashback in its narratives to make the introduction of the main character's background story not abrupt.

Apply narration methods from other art forms.

`# sense of immersion`

Referring and applying common narration methods form other forms of arts can be inspiring in making understandable and engaging narratives.

Dos and Don'ts

- Do consider referring to narration methods from other art forms in order to create clear and engaging narratives.
- Don't make the narrative in the onboarding phase hard to understand or add unnecessary implicities.

Example of implementation

In Persona 5, the game set a BOSS fight in its onboarding phase, making it one of the most impressive part in the onboarding.

Provide narrative climaxes in the onboarding.

`# sense of purpose` `# sense of immersion`

Climax is the turning point in a narrative with highest tension and drama. The narrative climaxes in onboardings can capture players' attentions, create unforgettable experiences, and increase their expectation towards the games, hence become more willing to continue.

Dos and Don'ts

- Do provide climaxes in the onboarding to provide impressive game experience.
- Don't make the narrative seems dull.

9.3 Guidelines Descriptions and Motivations

In this section we present the guidelines allied with descriptions and motivations, each guideline was motivated by insights from the first-person research and qualitative data from the empirical research.

9.3.1 Guideline 1

Combine the Explicit and Implicit Guidance for Better Mastery

In games, players tend to seek information which could tell them how to play the game, and establish mental models regarding how to find these information. It is necessary for narrative-rich games to organize several guidance in their onboarding to explicitly or implicitly provide tutorial information. Here we illustrate a general model of a guidance combination:

- Use overlay UI elements to remind operations and quests.
- Highlight interactive objects in the environment with special visual features.
- All of the features should be modeless in order not to interrupt the immersion.
- When possible, also consider use NPC's words as reminders.

Motivation:

All of the 8 narrative-rich games analyzed in the first person research utilized the model mentioned above to provide tutorials. From the empirical research, participants also suggested this model was where they got information about how to play the game: "I noticed the overlay text on the right to teach me how to attack." (P10) "Yellow objects seems interactive." (P9) "The NPC said there must be someway to open the door so I know this door can be opened." (P1) Other narrative-rich games analyzed also used similar elements to display tutorial information. Take one puzzle-solving in the onboarding of God of War as an example, in the test, most participants (N=11) could perceive the puzzle-solving tutorial content by this combination of explicit and implicit guidance, their learning paths can be summarized as follow: they firstly realized this is a puzzle solving by hearing the NPC's dialogue, then they noticed the prompt frame on the up-left corner updating quests and another one on the up-right hinting the operations needed to solve the puzzle, after that they saw the highlighted objects in the environment and they finally solved the puzzle by using suggested operations to interact with them.

9.3.2 Guideline 2

Do not over weaken the visual impact of UI elements.

Keep a minimalism style UI can maximize the filming sense of the game. But when using overlay UI elements to display tutorial content, make sure these elements are visually obvious enough on the screen so that players can understand them immediately. UI elements with too low visual impact can easily make players feel lost, hence interrupt their immersions.

Motivation:

Keep a minimalism style UI can maximize the filming sense of the game, combining with realistic picture quality, this strategy can provide players an immersive game experience. While the overlay UI elements in games should keep a balance between simplicity and readability. One example of over-simplified design causing cognitive barriers was in the onboarding of God of War, the game used small white dots to mark objects which can be interacted by pressing the red circle button on the handle , some participants (N=3) didn't notice the dots, many participants (N=7) did not successfully build connection between the white dots and the circle button. Similarly, in the game, medicine was highlighted by green light beams in the environment, while the collectables were highlighted using white light beams, most of the participants (N=8) suggested the white light beam was diluted in the environment, which resulted in the missed collection and the inability to form the awareness of collection and exploration.

9.3.3 Guideline 3

Integrate tutorials with contexts for better mastery and immersion

When teaching operations and introducing plots at the same time, consider integrate tutorial content with narratives to leave players deeper impressions on both operations and narratives.

Motivation:

For narrative-rich games, the tutorial content cannot be separated from the plot. To complete the narrative and tutorial at the same time within a limited time, it is necessary to integrate the tutorial content into the plot and narratives. According to Hodent (2017) providing contexts and meanings for tutorials lets player learn by doing, provides players deeper process and greater motivation for better retention. Most narrative-rich games analyzed in the first person research adapted this method in their onboarding, for example, Horizon utilized a plot of hunting to teach how to shoot arrows, Ghost of Tsushima designed a flashback narration to introduce its combat system as well as the past story of the main character. In God of War, in addition to the simple and standard contextual tutorial (teaching the jump on the broken bridge, teaching the Spartan Rage ability when angry), this game also designed a small plot to warm up the player before the introduction of a new operation, we called it beforehand contextual tutorial. In the empirical research, all of the participants (N=12) gave positive feedback on this form of tutorial, they stated integrating tutorial with plots not only made them learn quicker and deeper, but also enriched their images of the narrative and characters: "Here let me form a kind of muscle memory in advance, and then I only need to take a glance at teaching frame later" (P1) "The archery section not only tells me that children can shoot arrows, but also tells me that I can let children aim and shoot arrows" (P11) "through the plot of the father teaching his son to shoot arrows I can have a more detailed feeling of the father's love to the son." (P7)

9.3.4 Guideline 4

Carefully consider the content and timing of interrupted tutorial

When using modal elements for tutorials, carefully consider the content and timing. Pop-up windows containing not clear or unnecessary information can be disturbing.

Motivation:

Using modal visual feedback such as pop-up windows to introduce relatively complicated concepts is common in narrative-rich games, from the artifact analysis, several games analyzed (N=6) used this form of visual feedback in tutorials. For instance, Horizon—Zero Dawn used pop-up windows to introduce complicated operations, God of War used similar methods when introducing combat knowledge, and Ghost of Tsushima used modal screens to introduce important game mechanisms. The content and timing of such tutorials can significantly influence players' feedback towards them. In the empirical research, participants showed three different kinds of feedback when a same pop-up window appeared at three different times with different content: all of the participants (N=12) thought the first pop-up window was unnecessary because what it introduced was very simple and it had already be showed just before; while all of them (N=12) indicated the interruption caused by the second pop-up window was acceptable because it introduced a new useful concept, moreover, two participants suggested the interruption was just before their first fight with a giant monster, it not only provided useful information but also made them feel relieved.

9.3.5 Guideline 5

Utilize player's existed knowledge to reduce learning burden

Previous knowledge of players could help them in learning a new game through positive experience transfer. Using common features or operations can reduce the volume of tutorials, and using common expressions can reduce implicitly in narratives.

Motivation:

Learning transfer refers to the influence of one kind of learning on another kind of learning, or the influence of acquired knowledge and experience on the completion of other activities(Perkins, 1992), and positive experience transfer is one kind of learning transfer. Specifically in the field of game, it refers to the impact that concepts in similar games or basic common-sense concepts be used on learning new concepts in games. From tutorial aspect, players can understand known concepts in a new game without explanation, for example, in the empirical research, all of the participants (N=12) could link red to being attacked and green to recovering without instructions. From narrative aspect, players can understand common expressions they have seen in other games or other form of artworks. For example, most of the participants (N=11) said that they feel like the protagonist was an old father who

doesn't know how to express love when seeing the father tried patting his son but eventually put his hand down.

9.3.6 Guideline 6

Display the locked content in the early stage.

Content which are locked but are interesting and worth exploring, such as advanced weapons and undiscovered abilities, should also be shown in the onboarding phase to raise players' expectation to the game.
In the empirical research, participants expressed their interests to collectable items and locked content in the onboarding: "If I know a collectable item is very good, I would put a lot of effort to find it." (P8) "I wonder what is in the locked room?" (P9) "Would I get rewarded if I collect all of the items in the lost and found system?" (P10) However, even though most of the participants (N=11) noticed and interacted with the collectable items, only a few (N=3) explored further. Participants pointed out the reason was that the way the information was displayed did not let them feel interested: "I noticed the other menus, I think if it looks more interesting, I will try it." (P6) "I was thinking completing the quest at that time, there was no information about what those collectable items mean, if I know they are meaningful I would try to find all of them." (P8) "I found the notification on the right about opening the lost and found system, but it looked nothing special, so I did not open the system, not realizing the system is an important and huge space to explore." (P10). Therefore it is also important to make interesting things look interesting.

9.3.7 Guideline 7

Visually emphasize important things in the environment.

Providing a visual hierarchy can guide players' attentions, help them form a sense of purpose. Important or interesting content should be visually emphasized in the environment if you want players to explore them.

Motivation:

Like designing other digital products, providing a visual hierarchy can help players navigate in the game environment, in the empirical research, participants also tended to pay more attention to visually distinguished objects in the environment. For example, in the onboarding of God of War, the secret room was set a special visual feature on its door, even though it was not on the main path and was locked, all of the participants (N=12) came closer and tried to interact with it. And all of the participants (N=12) indicated highlighted or shiny things like collectables and yellow lights were attractive to them in the game. While participants showed less interests to the treasure chests and only a few of them (N=2) discovered them because they were designed to be less obvious in the environment. Participants also showed that visually attractive objects helped them developed the sense of purpose: "I tried to interact with the secret room but found it was locked, I was curious about what was

in it.” “I feel the yellow lights along the way are for navigation.” (P4) “I collected the object which were closer to the yellow lights but ignored the treasure chest which were actually closer to me, I thought I should go to the direction with yellow lights. “ (P12)

9.3.8 Guideline 8

Imperceptibly assist player in pathfinding.

Players rely on visual signs to find the right path, setting special objects in the right direction can prevent players from getting lost, hence increase sense of purpose and sense of immersion.

Motivation:

Special objects such as NPC or highlighted things with special color are key signs players would rely on to navigate in the game environment, players can feel lost when there is no such signs, hence felt a low sense of purpose. In the empirical research, participants found the right direction in the environment by following the NPC (N=12) or searching for certain objects along the path (N=10): “if you want to experience the plots, you should follow the NPC.” (P2) “I started following the NPC after leaving the boat.” (P4) “I felt the yellow lights alongside built a sense of navigation for me.” (P4) “I felt the yellow objects along the road were put here to guide the path.” (P11) When there was no special objects, participants could get lost: “I explored further in the forest but suddenly I found I cannot see where the son (NPC) was, so I got lost.” (P5) "NPC has left so I gave up exploring more in the environment because I was feared to be lost." (P1) “There was a smoke effect covering the yellow objects on the way after battling so I cannot see which direction was right.” (P6)

9.3.9 Guideline 9

Set an NPC accompanied the player in the onboarding.

A follow-up NPC accompanied with players can remind players of how to operate during specific teachings, guide players forward in the right direction, and complete the narrative of the plot through dialogues with the players’ character.

Motivation:

Follow-up NPCs are NPCs that are designed to be accompanied with players in the games, such as Yuna in Ghost of Tsushima, Rost in Horizon Zero Dawn, and Atrus in God of War. They are important deuteragonists in the games and are necessary from narration aspect. While another important purpose for which they are designed in the onboarding phase is to introduce players the knowledge needed to play and master the games. In narrative-rich games, a follow-up NPC can have significant influences on sense of mastery, sense of purpose and sense of immersion. In the empirical research, all of the participants (N=12) indicated the follow-up

NPC is helpful: from sense of mastery aspect, follow-up NPCs can remind players operations or take part in specific tutorials: "The child said the axe is not working to this kind of enemies." (P4) “I learned how to shoot arrows by teaching Atrus (NPC) how to shoot.” (P6) From sense of purpose aspect, follow-up NPCs often axt as a guidance to show the right direction: "I have a sense of being guided, and in the plot, the child is asked to find a deer, so it naturally feels like I have to follow the child, let alone that he was walking in front of me." (P2) “Following the NPC is always right.” (P11) From the sense of immersion aspect, follow-up NPCs can promote the plots or interact with players through dialogues or actions, therefore let players get into the narratives: “I felt the God of War is an old father who doesn’t know how to express love through his interaction with his son.” (P4) "The question the son (NPC) asked the main character was also what I was wondering." (P10)

9.3.10 Guideline 10

Interactive cutscenes are better than cutscenes with long animations.

Compared to using long animations, making long cutscenes interactive can maintain players’ attentions and immersions.

Motivation:

It is common for narrative-rich games to use cutscenes to introduce plots. Being different with cutscenes with pure animations, cutscenes with interactions in them keeps players’ attentions on the game because players not only watch but also interact with the cutscenes. In the empirical research, most participants expressed positive feedback towards interactive cutscenes, as one participant stated: " these cutscenes allowed me to control the character instead of just standing by, which provided me a strong sense of participation, I have never had such experience in other games." (P10) Compared to interactive ones, another cutscene in the game which contained pure animations provided less sense of immersion to participants: “I was easily get distracted while seeing long animations.” (P8) “I think the long animation is kind of boring, it would be better if some interactions were added.” (P4)

9.3.11 Guideline 11

Apply narration methods from other art forms.

Referring and applying common narration methods form other forms of arts can be inspiring in making understandable and engaging narratives.

Motivation:

Referring to the common narration methods of other form of arts such as movies or novels can be inspiring on creating a clear and engaging narrative in games. For instance, God of War adapted a one-shot lens in its onboarding, which can be often seen in films, making there almost no abrupt pauses in the whole onboarding phase, participants indicated this feature maintained their continuity of the game

experience, and enhanced the immersion, most of the participants (N=11) expressed it was quite seamless to play this game, as one participant explained: "this game can be directly played, there is no loading icons on the screen, which is quite seamless and makes me feel immersed." (P4) Another example is the game added suspense in the dialogues between characters, which can capture participants' attention and make them become immersed in thinking about the plots: "I don't quite understand what the god of war did in the past, but I can feel that he has hidden a lot of things without letting his son know. Many of the questions his son asked him during the trip were also the ones I was curious about." (P6) The game also adapted several expression methods such as contrast and portrayal to influence players' emotions, most of the participants (N=9) said that there are two impressive plots in the entire experience: one is the giant monster that suddenly appeared in the quiet atmosphere. This contrast between quiet and fright made the participants unforgettable. Another impressive moment was when the stranger (the boss) punched the player into the air, after pretending being weak and being knocked to the ground by the player. This kind of character portrayal quickly captured participants' attention and made them developed a deep impression towards the boss. Other narrative-rich games also adapted narration methods from filming or novels to organize their narratives. (Sucker Punch Productions, 2020)(Atlus, 2016).

9.3.12 Guideline 12

Provide narrative climaxes in the onboarding.

Climax is the turning point in a narrative with highest tension and drama. The narrative climaxes in onboarding can capture players' attentions, create unforgettable experiences, and increase their expectation towards the games, hence become more willing to continue.

Motivation:

Climaxes in the narratives of an onboarding can create tensions and dramatic effects(Wikipedia, 2020), therefore provide unforgettable impressions, deepen the players' memory to the game content, provide a sense of immersion. As mentioned in the last guideline, the two moments which most of the participants (N=9) thought impressive and felt immersed were also where the game set climax in its onboarding's narrative. Besides, participants also expressed these high peak experience increased their sense of purpose because they expected to experience more such impressive combats if they could continue: "I want to fight more giant monsters like this one in the game." (P1) "I want to experience more boss fights." (P5) "I like the combats in this game, I wonder if the giant monster is related to the plot." (P11)

10
Validation and Refinement

10.1 Expert Review

We adapted expert review in the validation phase. Expert reviews are often expanded by heuristic evaluation by assessing the design not only for compliance with heuristics but also with the emphasis of the reviewers' knowledge of expertise and past experience, it can be done at any design stage (Design Kit, n.d.). The whole UX researcher group in the client company were invited as the reviewers in the validation, we sent the visualized version of guidelines to the researcher group in the client company, they walked through the guidelines and evaluated them based on their experience, knowledge of expertise, and working context to figure out possible usability issues. Three aspects were focused in this expert review:

- Validity of These Guidelines in Practice
- Possible Application of These Guidelines
- Limitation of These Guidelines

10.2 Changes After Expert Feedback

From the written feedback from expert review, two suggested refinements were summarized as the result of this validation: "Summarizing the guidelines with top-leveled themes" and "Articulating the inter-relatedness among the guidelines". We present them in the following sections.

Top-level Summarise

According to the feedback we acquired from expert review, the content of some guidelines seems overlapping and some guidelines are proving each other, for example guideline 2,7,8 talked about guiding and attracting players via visual elements, and both guideline 10, 11 pointed out how narratives can be designed to present to enhance players' retention.

One suggestion from experts is to use higher leveled principles to group these guidelines therefore these commonalities and connections among guidelines would be marked out, and the readers would have better overviews towards them. For example guideline 2, 7, and 8 could be categorized into a group called "create at-

tractiveness through visual elements".

Based on this feedback, we conducted a higher level classification on the existing 12 guidelines. In the specific application of each guideline, they have different means to achieve their effect. According to these means, we divide the guidelines into five higher-level categories.

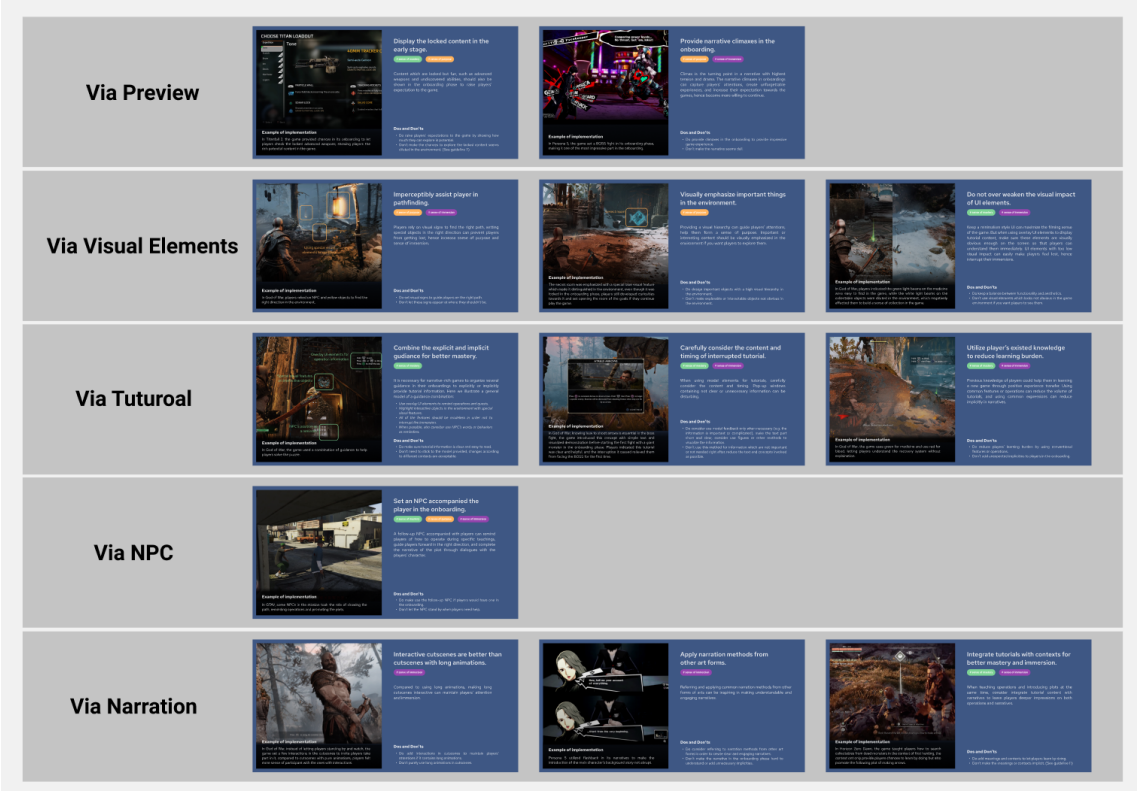


Figure 10.1: Top-level summarise for design guidelines

Inter-relatedness

The accuracy and credibility of the individual guidelines are good, but the overall structural framework of the guidelines is not clear. Therefore, the readers could understand the individual guidelines but felt unclear about how they cooperate/influence each other. In the planning of actual works, it may only form a one-sided impression of the principles and fail to form an overall cognition. As a result, researchers may use each guideline individually but may be difficult to apply them as a whole.

A refinement suggestion from experts is that articulating the inter-relatedness among guidelines to facilitate developers understand how the guidelines may influence each other. The figure 10.2 below illustrates an example of this inter-relatedness between "Visual Element" and "Immersion Enhancement".

Figure 10.2: The influence between "Visual Element" and "Immersion Enhancement"

As shown in figure 10.2, when designers want to set up visual elements for specific intention such as "attract players to go and check", there are some aspects that might cause negative effect on this intention. During the test, many participants ignored the "visual elements" on the road due to the influence of NPC's movement and dialogue. Therefore, designers should make targeted choices and balances when choosing these guidelines according to the characteristics of the game, so as to optimize the onboarding experience.

11
Discussion

Here we discuss the limitation of the results that might affect the universality and reliability of our design guidelines, the process of how to analyze the data and generate guidelines, the generalizability of the guidelines, and the future works we or other researchers could be done. In the end we illustrated the ethical issues that occurred during the project.

11.1 Result

Measuring Changes

In this project we generated guidelines regarding how to design the onboarding phase of narrative-rich games to increase players' retention. The guidelines presented pointed out how game onboarding can be designed to create or increase players' sense of mastery, sense of purpose and sense of immersion, therefore increase their willingness to retain. While it is difficult to determine to what extent each guideline can change players' willingness to retain regarding to the three factors over the studies in this project. The reason of this limitation was though eight narrative-rich games were involved in the artifact analysis, only one of the games containing all of the common features were involved in the empirical research. In the empirical research participants played this game's onboarding and provided qualitative feedback about what they thought enhanced or decreased their experience in terms of the three factors, which motivated the guidelines. Thus from the feedback of empirical research we could identify whether utilizing certain game features could benefit participants' retention, while it was difficult to draw conclusions regarding participants' retention changes.

Therefore these guidelines can provide qualitative answers to whether players' retention can be increased or decreased by utilizing certain designs or features, but they are not able to answer by how much applying certain designs can change a certain game's ability to retain players.

Structure of Guidelines

Besides, according to the feedback of validation, the structure of guidelines could have been clearer. In the practical work of game development, developers need to have a overall cognition to how these guidelines were organized or structured. They need to understand how these guidelines approve each other and whether a

guideline can be conflict with other guidelines. They would also be interested in whether some guidelines can be utilized as combinations, so as to holistically apply them. Structurally clarifying these guidelines is one of the focus of furthering these guidelines into practice.

11.2 Process

Data Analysis Methods

In the project three data analyses were conducted, we utilized three different methods correspondingly according to the data input and output. We adapted affinity diagram as the method to analyze the data from artifact analysis, we analyzed extracts describing the game elements we found in the games and finally resulted in themes describing the commonalities among narrative-rich games. This reveals affinity diagram has the advantages of transferring fragmented descriptive data into holistic conclusive themes.

While we used thematic analysis for the data from empirical research, through this method, we started with pages of notes about participants' unstructured feedback and finally transferred them into overall opinions regarding certain game features or designs. The results of thematic analysis is similar with that of affinity diagrams, while thematic analysis is more suitable for analyzing or deconstructing data with paragraphs of text.

Inductive analysis was utilized for complementarily analyzing the two qualitative results we generated from affinity diagram and thematic analysis. Through this process we compared the commonalities derived by affinity diagrams with themes obtained by thematic analysis, finally generated the guidelines by figuring out the core themes or essence of these data. Compared to affinity diagrams and thematic analysis, inductive analysis is conducted on smaller scope of data but can reveal deeper insights.

Research: For Design and Through Design

The motivation of this project is to present design guidelines for the designers and developers in the game development department of client company, so as to provide them guidance and insights in their future self-development game process. Downton claim that research for design is research to enable design (Downton, 2003), and as Rob Tieben maintains, it "provides information and insights that designers can use in specific design projects, in order to achieve abetter end-result" (Tieben, 2015). The methods such as user research, refers to Frankel and Racine, is also an typical example of research for design (Frankel & Racine, 2010). Therefore, the attribute of the entire project is definitely the research for design.

However, a guideline with universal value and promotion value cannot be successfully produced through a single research for design. During the validation, the ex-

perts involved in the evaluation stated that it is difficult to evaluate and refine the applicability of a guideline without a specific game carrier. In the future game development process, designers and developers can make a specific version of the game demo for the guidelines produced by this project, so as to conduct A/B testing to better refine the guidelines, and this process will become research through design. Research through design is about creating knowledge through action-reflection in design process (Jonas, 2012), and the created knowledge could be used in future general projects (Frankel & Racine, 2010), such as the design guidelines.

11.3 Generalizability

The aim of this project is to generate design guidelines to facilitate designing onboarding in narrative-rich games. The guidelines generated in this research presented the common features being used in narrative-rich games, and suggested how these features can influence players' retention in terms of sense of mastery, sense of purpose and sense of immersion. From this perspective the results could be utilized as a tool to the design and evaluation works regarding onboarding of this type of games.

From the perspective of the content of these guidelines, they may also have potential applicability in other genres of games. For example, in the guidelines some of them were related to influencing players' sense of mastery or sense of purpose, they may also be able to be applied on games with no narrative elements. Besides, for games like interactive movies, which contain rich narratives but little ACT gameplay, some of the guidelines focusing on narrative immersions might also be applicable. While the suitability of such applications are unknown based on the study result in this project.

11.4 Future Work

Comparative Studies

At present the result has the limitation of being not able to measure changes of players' retention. (section 11.1) In the initial plan of the empirical research, apart from the God of War, which was selected as the game being tested because it contains the most commonalities we extracted from first-person research, Tom Clancy's the Division 2 (Ubisoft, 2019) was also selected because it contains the least commonalities, in the initial plan we would test these two games for each participant, thus from their feedback we could get comparative results. While by conducting pilot test we found participants would feel tired and lose focus when they were playing the second game, this fatigue can significantly affect their feedback regarding whether they would retain the game. Thus in the final plan participants would only play the God of War in the empirical tests, and we suggest more empirical tests involving different narrative-rich game are needed as comparative studies to investigate user experience changes regarding sense of mastery, sense of purpose and sense of

immersion.

Players' Preferences

Participants' preference towards narrative-rich games were various. To some participants, they paid more attention to collecting valuables and upgrading the character in the game, in the onboarding they expected more freedom and showed more patience on spending time finding ways. While the other participants preferred the role-playing, combat and narrative elements in the game, their satisfactions depended more on whether they could smoothly experience the story and enjoy the high quality graphics and combats. Certain game feature can obtain different feedback from players with such preference difference. For instance, the follow-up NPC can keep players on the main path in the onboarding, to players with the preference of experiencing the narrative, they indicated the NPC helped them follow the story (P1) (P4) (P6) (P9). While to players who set collecting and upgrading as their main goal in the game, they claimed they were sometimes over-directed by the NPC hence missed some collectable items in the onboarding (P8) (P10). But all of the participants claimed the NPC was helpful in pathfinding. While applying the guidelines, considerations about players' preferences are needed when it comes to applying specific game features. Certain game features' influence to players with different playing habits or preferences could also be an interesting topic for further studies.

11.5 Ethical Issues

Game Content

"Ethical issues are present in any kind of research", wrote by Orb et al. (2001). In this thesis, the first ethical issues to consider is the game itself. According to Dang et al., player would be affected by new video games in many ethical aspects, including but not limited to violence, rating, education, stereotypes of women, community, addiction (Dang, Lee, & Nguyen, 2007) and so on. Therefore, according to the acceptance of different game content by people of different ages, various regions have also made corresponding grading systems for different games. For instance, European Union adopts PEGI age ratings system to ensure that entertainment content is clearly labeled with a minimum age recommendation based on the content they have (Pan European Game Information, 2017). In this thesis, the ages of the two researchers, supervisor, adviser, and all participants have reached the age limit for the games that involved in the study.

Data Collection

In this thesis, empirical research was employed to acquire qualitative data from the real gamer. In this kind of qualitative research which includes the process of data acquiring from participants, Orb et al. claim that "the research process creates tension between the aims of research to make generalizations for the good

of others, and the rights of participants to maintain privacy" (Orb et al., 2001). In this paper, the private information such as name and age of all participants will be hidden, and only the qualitative data generated during the test will be collected and displayed in the thesis in an anonymized or statistical manner. According to EU GDPR (gdpr-info.eu, 2016) regulations, all participants will sign a Data Processing Agreement document before participating in the test, so that researchers who are Data Controllers and Data Processors can obtain the right to use their data from participants who are Data Subjects.

NDA Issues

Since this thesis is a collaborative project, the client's information relevant to NDA issues shall be protected. The contents in this project which processed and generated by students in Chalmers can be used for master thesis, public defense as well as publication. According to the requirements of the client, the name of company and advisor will be anonymous in the thesis and any statements about the company's business purpose or strategy should not be mentioned.

12
Conclusion

In this project we presented guidelines for designing onboarding in narrative-rich games. Resulted from the dramatic increase of Chinese console game market, this project aimed to provide guidelines to facilitate the design and evaluation of narrative-rich games' onboarding regarding Chinese players. The purpose of this thesis is to answering the research question:

What factors should be considered and utilized in the onboarding design of narrative-rich games to enhance players' sense of mastery, sense of purpose and sense of immersion?

To be able to answer this question, studies on game design guideline, onboarding phase and narrative-rich games has been conducted firstly, as well as interviews with industry experts. Furthermore, this project articulated the criteria of evaluating onboarding in narrative-rich games, foregrounded the process of generating the guidelines. The result was motivated and evidenced by themes extracted from first-person research and user experience feedback from participants in the empirical research, which illustrated common methods being practiced in designing onboarding in narrative-rich games and how they influenced players' willingness to retain from different aspects. Following the process we presented, comparative studies on different games could be done in future works for more consummated results. We also see our process and result a good approach for studies focusing on more detailed topics such as certain game features' changes to user experience in the onboarding phase.

The research question was answered by delivering onboarding design guidelines for narrative-rich games. This project resulted in a total of twelve design guidelines, crossly mapping on three defined onboarding factors, they are respectively sense of mastery, sense of purpose and sense of immersion. The guidelines generated during this project should be understandable and usable in terms of design practice, but they should not be seen as ultimate. We hope the guidelines and process we presented could inform or inspire the design and evaluation works on games and studies focusing on related topics.

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A

Links of Artifact Analysis Reports

Here you can find links for the artifact analysis report respectively. The original report of Red Dead Redemption 2 will not be made public according to the confidentiality agreement, and the report of Grand Theft Auto V was written in Chinese as the requirement from advisor.

The Artifact Analysis Report of **Grand Theft Auto V** can be found https://drive.google.com/file/d/1M6BRJ06QjoYSWmn-XsYhWepdjZeVhvhO/view?usp=sharing

The Artifact Analysis Report of **God of War** can be found https://drive.google.com/file/d/1t_274DVXmDxF3_J0JNWkZf7TbolTBUxw/view?usp=sharing

The Artifact Analysis Report of **Horizon Zero Dawn** can be found https://drive.google.com/file/d/1MnGLh71DnUXNEMURtpyGOJY89fStv-P4/view?usp=sharing

The Artifact Analysis Report of **Titanfall 2** can be found https://drive.google.com/file/d/1eDCy74en-xePDcIytBWvgAD5XxB-O29S/view?usp=sharing

The Artifact Analysis Report of **Ghost of Tsushima** can be found https://drive.google.com/file/d/11PuDZpC8ymZhGkG91yq2h6TNAr4rjgyY/view?usp=sharing

The Artifact Analysis Report of **The Division 2** can be found https://drive.google.com/file/d/1eQpTKY-dS8CWNg1-nYMwWA9u3F49bLeB/view?usp=sharing

The Artifact Analysis Report of **Persona 5** can be found https://drive.google.com/file/d/1g0tkYp4ni2zUbQ4V9pjOtLYTahqHPAsn/view?usp=sharing

B

User Test Protocol

Through this test, we want to know:

What kind of behaviors and game habits players will have when they are in the onboarding phase, especially acquiring the player's feedback on the game features proposed in the theory creation stage based on the onboarding criteria?

The table B.1 illustrated the procedure of the user test:

Table B.1: User Test Procudure

Procedure	Focus	Time
Ice-Break	Participant's basic information and game/narration experience	5 min
Observation	Participant's behaviors while playing the game	30-45 min
Inspection	Participant's overall feeling towards the criteria	10 min
Key Points	Participant's feedback on features proposed in the theory creation in terms of the criteria	15 min
Special Behavior	Additional feedback behind special behaviors	1-5 min
Overall	Participant's overall experience of the game onboarding phase and its willingness to retention	3 min

Step 1: Ice-Break and Information Validation

Basic Information

(Ice break in the very early beginning and validate the age)
Basic kick-off conversations. (Greetings/weather/meal/thanks)
e.g. What's your name? Thank you for taking part in this user test. Etc.
Would you mind if I ask you about your age? We just want to confirm that you meet the standard for playing M+ games.

Game Experience

(Acquiring the information for player segmentation)
Can you tell me about your game experience? (Focus on the RPG, console games if mentioned)
What game you are playing/played? Genre? Platform? Why?
Have you played RPGs before? If so, what?
Have you played shooting games before? offline or online?

Any goal/motivation/aim when playing? (Collection/ Combat / Narration/ Social....)

Narration Experience

(Validating the player's attitude about narration)
Ask about the narration experience in other arts, e.g., movies, novel....
e.g. Are you familiar about the narration methods in movies or novels?
Nailed out some narration methods you know? Flashback....
e.g. Could you briefly introduce some narration methods you know?
Would you pay attention to the narrative elements when you are playing the game?
Have you played the games which has rich narrative elements? (Interactive movie games?)

Step 2: Observation and Field Notes

Let participant experience the whole onboarding phase with no disturb.
the researcher observes participant's special behaviors during the play (e.g. lose the game, getting lost, feel excited, shouting, don't follow the routine etc.) and took the field notes.

Step 3: Inspection Based on Three Criteria

Inspection of Sense of Mastery

Self-judgement:
Do you think you have mastered the game operation?
Do you have confidence to win the most combat in this game?

Inspection question from researcher Which button is for interaction?
Can you describe the process of throw axe
Do you know how to defeat the Giant Boss?
Can you try to pass the following puzzle checkpoint
....

Inspection of Sense of Purpose

Self-judgement:
Do you think you know what you should do next in this game clearly?
Do you know how to update your character's attributes in this game?

Inspection question from researcher:
Do you know how to increase your HP?
Can you name some aspects that your character could update?
What is the use of the silver coin?
What you want to do next?

What is your most expectation in the following game chapter?
. . . .

Inspection of Narrative Immersive

Self-judgement:
Do you think you understand this story that game told? (Ask to describe the story)
How much time do you think you spend in this game experience process?

Inspection question from researcher:
Can you describe the characteristic of God of War(father)?
. . . ...Son?
What things that the characters need to do in this game?
Why they leave their house and go to adventure?
Which is the most impressive image this game left to you?
Have you reminded any annoying things when you play this game?
. . . .

Step 4: Record Interview

Reviewing the game records with participant
Watch the record of the play with the participant.
Examine the player experience and behavior
Let players point out what they like and what they don't like while watching the video.
Ask about the reasons:
Why do you like it?
Why don't you like it?
Do you think it's helpful/not helpful for you to learn and master this skill? (Sense of Mastery)
Do you think it made you feel to expect more/less in the game? (Sense of Purpose)
Do you feel it increased/decreased your immersion in the narrative? (Narrative Immersive)
Researchers take notes of the answers

Step 5: Special Behavior Q & A

Ask questions regarding special behaviors.
Ask questions regarding special behaviors observed during step 2 for additional opinions.
The questions should be related to the onboarding criteria.
E.g., we noticed you got lost in the temple but finally found a way out, could you tell us how you got lost and how did you find the right way? Do you feel it affected your learning how to play the game? Affected your sense of purpose? Affected your immersion?

Step 6: Overall Experience and Willingness to Retain

Interviewing overall experience and player's willingness to retain
Ask the willingness to retention and the overall experience of onboarding as well as this game.
E.g., Do you feel you would like to continue playing this game?
How would you score this game experience from 1 (bad) to 5 (very good)
from aspect of sense of mastery?
from sense of purpose?
from narrative immersion?

C

Data Processing Agreements

This Data Processing Agreement specifies the Parties' data protection obligations, which arise from the Data Processor's processing of personal data on behalf of the Data Controller under the quote, service agreement, or other agreement between the Parties. If any provision of this DPA is inconsistent with any term(s) of the Agreement, the DPA will prevail.

Supervisor: Xingyu Zhang & Yibin Huai

Dear participant! Thank you so much for taking part in our test!

This test is a part of a study about our master thesis project conducted for the course DATX05 Master Thesis in Interaction Design and Technology / Game Design and Technology at Chalmers University of Technology conducted by the supervisors mentioned above. The results from today's test will generate insights about user experience and will be used in our thesis presented to the examiners of the course. If you have any questions about the test after it is conducted, please email: xingyuz@student.chalmers.se

To be able to draw relevant conclusions, we will have to collect information about your name, occupation, age and gender. The personal information mentioned previous will be kept strictly confidential and comply with EU GDPR related policies. All data collected during the test is only used for the academic purpose of this master thesis project. During the test we will record your gameplay for documentation purposes and to help the evaluation. The records will be deleted in the end of this project.

I agree to have data of me taking part in the test taken ☐
I agree to have records of my gameplay taking part in the test taken ☐

I hereby declare I have read and understood the content of this document:

Signature:

Date: