

Lund University

Master Thesis

**Exploring Players' Interaction And
Experience in Role-play Game From
Perspective of Affordance and Value Co-creation -
a Case Study of Fallout 76**

SMMM40 | 30 credits

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Yao & Jing

Abstract

The concept of servitization has brought about a significant transformation in numerous industries, signaling a strategic shift from a focus on goods to a service-oriented perspective. With the ascent of “Games as a Service”, Service-dominant logic is highly relevant in understanding games as a service, where players emerge as co-creators of value, shaping their unique experiences and meaning in the value co-creation process. While previous research has extensively explored players’ gaming experience from a goods-centric viewpoint, it overlooks the active role players assume in the joint sphere of value co-creation. Thus, delving into the interaction and relationship dynamics between players and the specific affordances in the gaming environment is crucial. Therefore, this thesis investigates how player’s value co-creation experience is and how affordances within games influence their value co-creation experience. The methodology employed for this exploration involves qualitative semi-structured interviews with 15 participants. The collected data are subsequently analyzed within the theoretical frameworks of affordance and value co-creation, which have been revised and developed for a more in-depth analysis.

The preliminary data analysis results reveal seven distinct types of co-created values that players can create and acquire, constituting their value co-creation experience, while the dynamic change of players’ relative value co-creation has also been articulated in this study. Regarding the factors influencing players’ value co-creation experience, the thesis posits that both players’ subjective factors, capability of perceiving affordance, and objective factors, the design quality of affordances construct an impact on players’ value co-creation experience. Finally, a series of findings are proposed based on the analysis chapter, including the player’s active and direct role in RPG content and affordance creation, and the links between players’ perception ability and design of affordance, etc. The thesis also concludes with a schematic presentation of value co-creation in RPG games and impacts brought by affordances, which can serve as a reference for scholars in the field of RPGs in the future.

Keywords: *Affordance, RPG, Service-dominant logic, Servitization, Value co-creation experience, Video games*

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I. Introduction

I am acting as a well-equipped person in Appalachia for achieving a task, equipping with the *T-65* newest version of power armor with red ranger coating and *Gauss minigun*, and there are around 20 people who were acted by 20 players worldwide in my current web Server, we all gather at the boundary of *Cranberry Bog* in Appalachia for killing the boss named *Scorchbeast queen*, which is the core requirement for fulfilling the task. After the nuclear bomb was thrown in the *Cranberry Bog*, the air smelled powerfully of dry dust, and the *Scorchbeast queen* emerged from the crevice of the land who had a pair of giant wings covered with thick black fur. The *Scorchbeast queen* utilized a variety of attacks to beat us: the creature adopted the combination of sonic attacking and strafing attacking towards us in the airborne, and all of us were hurt because of the powerful area-of-effect damage created by her; she filed flexibly in the sky with the unbelievable speed, so we even didn't have time to aim at her for shooting accurately. The whole team was suddenly in a mess.

However, the team leader created a new fighting strategy and allocated all the members in three seconds, then we started to execute the schedule: all the people including me who were equipped with power armor and heavy weapons gathered in the front. We raised our heavy weapons (*Gauss minigun*, *Gatling gun*, *Gatling laser*, etc.) and successfully attracted the attention of *Scorchbeast queen* because of our dense and violent shooting, while the power armors provided a great defense under the attacking pressure from the boss. When we were undertaking the damage from *Scorchbeast queen*, members who were equipped with snipers, Railway rifles, and Auto grenade launchers earned time to hide in the covert corners and aimed at the Swings of the boss. The *scorchbeast queen* soon broke her wings under the fierce attack and was supposed to land on the ground, she lost the capacity to fly. We threw almost all the grenades and bombs toward her, some members even grabbed the melee weapons and rushed at her for attacking. Finally, the *Scorchbeast queen* was dead and we celebrated the victory and the completing task.

This is a description of the authors' playing experience for achieving a task in *Fallout 76*. As a post-apocalyptic multiplayer online role-playing game developed by Bethesda Game Studios and published by Bethesda Softworks (Fallout Wiki, 2023), *Fallout 76* is the most updated version of the *Fallout* series (ninth overall) that mainly describes the life and different regions

in the United States after suffering the nuclear blasts caused by China in 2077 (Fallout Wiki, 2023). However, Fallout 76 revealed a series of progresses and differed compared with the former works in the Fallout series: all the former works belong to single-player games. Fallout 76 also has designed plenty of content that can support single-player playing, but online multiplayer playing constitutes the essence of this role-playing game: the collaboration between players becomes a crucial factor for fulfilling the tasks in the game. Furthermore, players can enjoy Fallout 76 according to their personal preference (Mo & Kim, 2019): some players mainly enjoy the beautiful landscape in Fallout 76 world; many gamers focus on the task and upgrading their level while immersing in the community; and making friends with gamers worldwide also becomes an attraction for a number of players. It shows that Fallout 76 set the high freedom for satisfying different players' favor of game experience, rather than emphasizing fulfilling the plot and tasks.

The positive reputation of the Fallout series, attractive game script, reliable game engine, and the high freedom of player experience in Fallout 76 organized the advantages for absorbing countless players worldwide and contributed to the high popularity and the evaluation as a "representative RPG (Role-play Game)" by many players (Bergstrom & Poor, 2022), while the character of the massively multiplayer game also constitutes to the difference between Fallout 76 and the majority single-play RPG. The multiplayer attribute prominently emphasizes more on collaboration among not only different players but also the players and game corporations for creating a stable and long-term game atmosphere and experience. Therefore, Fallout 76 itself deserves to be researched as a representative case of the RPG area based on these advantages; on the other hand, many existing Fallout 76 players' communities provide the possibility of executing data collection and analysis; Furthermore, an author in this paper has played Fallout 76 for around 247 hours, so the personal experience will also assure a deep comprehension and interest in Fallout 76. These factors generally formed the purpose for authors to write Fallout 76 as the research case of the thesis. In consideration of the fundamental attribute of Fallout 76 as a video game, the thesis will start the introduction with an explanation of video games.

1.1 Background

More and more businesses around the world are adding value to their core business offerings through services. The concept of servitization has become a changing trend and witnessed an

integration of both goods and services (Robinson et al., 2002). It's a process where firms set out to create greater value by embracing service orientation and/or developing more and better services, intending to satisfy the requirements of customers. (Ren and Gregory, 2007; Vandermerwe & Rada, 1988). Servitization is happening in almost all industries around the world. Service companies and manufacturers are moving more aggressively into services, driven by deregulation, technology, globalization and intense competitive pressures (Vandermerwe & Rada, 1988). Vendrell-Herrero et al. (2017) acknowledged the function of digital technologies as a driver and enabler of servitization (Vendrell-Herrero et al., 2017,p.69). It's also driven by customer needs and is seen by businesses as enhancing their competitive advantage, reshaping the way companies deliver value to their customers (Ren and Gregory, 2007).

The servitization trend represents a strategic shift in business from a goods-centric to a service-centric concept. As Vandermerwe & Rada (1988) stated, it's a strategic movement away from an exclusive focus on products to an integrated system of products and services, where services always play a more important role replacing products. Business models related to servitization are used to develop the company's innovative capabilities to create value at the level of customer provision (Visnjic & Van Looy, 2013) The shift from product to service can be observed in various industries. For example, in the manufacturing industry, product design is no longer the only source of competitive advantage and divergence. Product service integration solutions bring innovation potential and add value to the overall product (Annarelli, et. al, 2016; Roy & Cheruvu, 2009). Some traditional industries have also experienced disruptive developments. For example, the newspaper industry is moving from traditional paper products to digital content for different electronic devices, and content is obtained through subscriptions. Peer-to-peer file-sharing internet services and streaming platforms have impacted CD sales in the music industry, resulting in a decline in total album sales. (Bhoot, 2017)

The servitization trend can also be witnessed in the video game industry. The traditional video game industry has been characterized by a product-centric approach, with companies creating and selling individual games as discrete products. Players purchase games in physical formats, such as cartridges or discs, or as digital downloads, which they can then enjoy on their own physical products. Over the past 30 years, the performance of a video game product depends largely on the technical capabilities of the hardware for which it is designed, and these capabilities have advanced tremendously (Handrich et al., 2022). The first generation of video

games can be traced back to the 1970s, when simple controls, light signals, two-dimensional graphics and text were set to offer interactions between players and games, like using Magnavox Odyssey or Atari 2600 system, the first generation of home video game consoles that contained CPU and featured processor and bytes of memory. (Ivory, 2015; Kirriemuir, 2006; Pelovitz, 2014). Technological innovations were featured in the 1990s, when video games were sold as CDs allowing for more storage of data and multiple player sessions with Local Area Network and internet connection (Wolf, 2008). The video game has continued to evolve since 2006, with new technologies and innovations, like new consoles to offer more powerful hardware and control schemes, and faster load time and virtual reality (VR) for better experience (Kirriemuir, 2006; Wesley & Barozak, 2016).

The new generation of video games has undergone a significant transformation from product to service. In addition to consoles, video games are currently accessible for play on the interactive web as well as across a diverse range of mobile devices such as smartphones and tablets. Gamers can choose among a variety of gaming platforms, such as smartphones, which are increasingly powerful as an attractive platform for video games. The industry is rapidly shifting from physical to digital distribution, with the proportion of physically released games falling from 80% to 69% from 2009 to 2011, with a corresponding increase in digitally released games (Marchand & Henning-Thurau, 2013). Affected by direct network effects, video games radiate a huge customer base and increase the utility of video game products (Shankar & Bayus, 2003). The development of the Internet and improvements in development technology have allowed gamers to play directly through the Internet and portable electronic devices. Local Area Network and internet connection facilitate more storage of data and multiple player sessions. (Wolf, 2008) Therefore, online video games offer convenience by empowering gamers to play over the Internet and massive multiplayer online games (MMOG), in particular, see significant growth (Mäyrä, 2008), which is the most typical representative type of video game turning from product into service. Marchand & Henning-Thurau (2013) found that in the realm of direct consumer networks, massively multiplayer online games like World of Warcraft boasted an engaged user community exceeding 10 million consumers, generating annual revenues close to \$1 billion. As reflected, MMOG games may represent a specific feature of video games or a major genre of games in the current video games market. Given the circumstances, the concept of Games as a Service (GaaS) is proposed, and the gaming industry not only provides players with games but also provides players with ongoing experiences and services (Gebauer et al., 2005; Hussain, et al., 2023). As a popular business model in the video

game industry, Games as a Service represents a shift from treating games as standalone products to treating them as ongoing services, focusing on long-term relationships between games and gamers with an aim of nurturing a dynamic and evolving experience in game-play. (Marchand & Henning-Thurau, 2013)

1.2 Problematization

The emergence of the “Games as a Service” (GaaS) trend (Gebauer et al., 2005; Hussain, et al., 2023) in the gaming industry signifies a shift toward providing live service games to gamers, deviating from the traditional model of distributing boxed product games (Weststar & Dubois, 2022). This transition from product-centric to service-oriented gaming has introduced new scenarios and research avenues. It has spurred extensive investigations into the nature of services in gaming, thereby fostering the development and application of a service perspective. Service-dominant logic (SDL), as proposed by Vargo & Lusch (2004), represents a paradigm shift from goods-dominant logic (GDL) to service-oriented logic, emphasizing the centrality of service in value creation. Unlike the traditional product-centric approach, SDL posits that value is co-created through interactions between various actors, with players playing a pivotal role in shaping their gaming experience and defining the significance of their experiences (Karababa & Kjeldgaard, 2014; Vargo & Lush, 2004). Therefore, it is imperative to explore players’ value co-creation experiences within the context of “Games as a Service” (GaaS).

Despite previous research focusing on players’ gaming experiences, much of it has been grounded in a goods-centric perspective rather than a service-oriented one. Players have typically been viewed as passive recipients of game designs, with little emphasis on their active involvement in value creation. While some studies have touched upon value co-creation, they have predominantly examined collaboration among various stakeholders without delving into the specific roles and experiences of players in this process. This study seeks to address these gaps by examining the servitization process from the players' perspective, exploring their active participation in value creation and their experiences thereof.

Furthermore, building upon SDL, Grönroos and Voima (2013) identified the sphere of value co-creation between service providers and customers, highlighting the interaction between providers and customers as a key opportunity for value co-creation. Affordance theory, rooted in the concept of affordances as environmental cues for action (Majchrzak & Markus, 2012; Gibson, 1979), offers a lens through which to understand how players interact with the game

environment and co-create value. However, while affordance theory has been extensively applied in human-computer interaction research, its exploration within the context of players' value co-creation experiences in video games remains limited. This study aims to bridge this gap by investigating how affordances shape players' interactions with the game world and influence their value co-creation experiences.

In summary, this study aims to enrich the understanding of value co-creation in RPG games by adopting a service-oriented perspective and exploring the role of affordances in players' value co-creation experiences. By examining players' active involvement in value creation and their interactions with game affordances, this research contributes to a more comprehensive understanding of the dynamics of player-game interactions and value co-creation in the context of "Games as a Service".

1.3 Choice of RPG

With the development of technology, various types of games are introduced to the game market to satisfy different needs of gamers. As people can see in video game development, multiple-player mode, especially massive online multiplayer mode, has become popular and dominant among gamers with a large market share. Among all genres in video game systems and also dominant genres, RPG is a representative and influential category, with non-negligible high popularity for both players and game companies (Seok & DaCosta, 2012). It takes a large market share as a massive multiple-player online game, which does not need specific physical game products, but an electronic portable device to access the game world. RPG has also created an environment for multiple players to play together and finish tasks altogether and has developed relatively mature communities in a series of social platforms for communication and discussion among multiple players. Therefore, RPG provides a wide range of chances for players to co-create value during gameplay. Given the great number of gamers and the large scale of members and mature communities, it is beneficial for sociology to execute research on RPG areas, articulating the RPG concept.

Features of RPG give gamers a comprehensive and immersive experience in the game world with a combination of different needs, like single exploration in the open world, competition to get higher rankings and progress, strategic and cooperative gameplay, development of characters, immersive narratives, and storytelling, interaction with characters, social interactions with other players, etc. Various demands can be satisfied and distinct features can

be experienced compared with other game categories. Hence, RPG is more representative than other games to explore their value co-creation experience due to its wide range of features and possibilities.

Another fundamental factor in implementing research on RPG is its remarkable meaning for the social learning, which has already garnered considerable interest from numerous scholars across diverse academic fields, including social science subjects (Sourmelis et al., 2017): Yu (2009) claimed these video games were crafted with the intention of fostering the skills like social interaction, effective communication, and cooperative teamwork among players engaged in tasks within a given context, and the acquisition of these skills are deemed by academics and policymakers as crucial as societies transition into a new era; while Dickey (2007) and Susaeta et al. (2010) also considered that the learning process for players to synthesize, analyze information, apply critical thinkings and surmount challenges in RPGs can be potentially transferable in real-life situations (Sourmelis et al., 2017, p. 42). Therefore, the popularity, characteristics, features and social significance of RPGs make it very relevant in this research to seek players' value co-creation experience and affordance in video games.

1.4 Research Questions

Based on problematization and theories to be used, the following research questions are proposed.

How is the player's value co-creation experience in RPG games? How do affordances constructed in the game world influence their value co-creation experience?

After confirming the research gap and research questions, the authors initiate the research design for solving the questions. The qualitative study is employed as the research approach for this thesis. Firstly, the player's value co-creation experience and the player affordance perception act as the core objects of the research question, so the thesis executes data collection for establishing the understanding and recognition of the player's relative perception and experience for proceeding with the research. The interview is applied as the methodologies in the research process, with the data coded at the same time. Then the thesis analyzes the coded data and addresses the research questions. In the research design chapter, the thesis introduces and explains the implementation of the research design in detail.

The master thesis consists of six chapters: introduction, literature review, theory, research design, analysis, and discussion and conclusion. The introduction chapter introduces the background of servitization in the video industry and also the problematization and research gap in this field, as well as our research question. The literature review section makes a general review of previous research on video games and Role Play games and also research about value co-creation and affordance in video games. In the theory section, a detailed theoretical explanation of affordance and value co-creation is presented and the application of models in the thesis is elaborated. The research design section refers to the adopted methodology and reveals the specifics of the data collection and data analysis method. In the analysis part, data collected from interviews is presented and further analysis and interpretation accordingly is deepened and interpreted. In the discussion and conclusion section, further discussion is iterated with a connection to analysis and the research background, research implications and limitations are stated, and a summary of the thesis is structured.

II Literature Review

2.1 Video Games and Role Play Games

Video games are “electronic or computerized games played by manipulating images on a video display or television screen” (Jiow & Lim, 2012), which operate with the mediums of some kind of computing machinery. Indeed, the video game industry’s evolution is just around 60 years. Steve Russel invented the first video game “SpaceWar” in 1962 (Zackarisson & Wilson, 2008). Nevertheless, its development demonstrates both the technological and fast-paced characteristics of the industry, and the growth is also embodied in the number, variety, and consumer market penetration of the industry (Zackarisson & Wilson, 2008,p.140). The current turnover of the video game industry is even greater than that of the film industry and is experiencing a growth rate four times faster than that of other segments within the media and entertainment industry (Malliet & Meyer, 2005; Prato et al., 2010). In academic research on video games, many topics have been covered. As a social outcome, a considerable amount of existing research has focused on the influence of too much time spent on video games on children’s personality, health, and socialization. Addiction was a focus that was considered relevant to children’s health (Braun & Girous, 1989; Ivory, 2015; Selnow, 1984). Research on the content of games was also investigated as the exposure to violent content in video games was questioned and thought to have negative effects which led to social issues (Dill Karen & Dill Jody 1998; Ivory, 2015; Griffiths, 1999). Another kind of research paid attention to the game itself, for example isolating different genres of games. Game design and player experience were studied for further improvement in game development and to tailor the games to a broad range of needs of players. In addition, interactivity was increasingly treated as an important mode in video games, either with the content of the game or with other gamers in it (90-92) (Elson et al., 2014; Williams, 2006).

With the development of computer technology and the internet, more detailed graphics, sound, music, and storylines could be integrated into the game and multiple users could be online at once to play which offers a complex and immersive game world (Dickey, 2007). It offers an excellent breeding ground and support for the development of RPG. Tychsen (2006) advocated that “RPGs possess widespread recognition for their influence on many other games” (Zagal & Deterding, 2018). As to the definition of Role-playing game, Zagal and Dterding (2018) presented a very detailed explanation. “Role-playing game serves as a term utilized across

multiple social communities to denote multiple forms and styles of the activities and objects centered around the rule-structured creation and enactment of characters in a fictional world". Players typically individually generate, enact, and govern the actions of roles, determining and chasing their individual goals" (Zagal & Deterding, 2018, p.35). Zagal & Deterding (2018) concluded the common styles of different RPG games are that players playing RPG would like to make progress and reach goals based on following rules, acting in a role, crafting a captivating story, or simulating a world. Game players enact the character in the game to fulfill tasks or conduct actions within the framework of a fictional world. Compared with other types of video games, the features of RPG are that players could have a high level of agency to perform actions of the character at their will, have many more choices to make, can define their own goals and meanings in the game and make own decisions that influence story and outcome (Zagal & Deterding, 2018). It also results in greater interactivity in RPGs, as they need to actively participate in the storyline and they are allowed to perform more actions and make decisions for goals given rules setting (Waskul & Lust, 2004). Various player modes are played in different RPGs from single-player to massively multiplayer online games (MMOs). Single players in RPGs enact characters and create stories alone, while multiple players attend activities and achieve goals with the help and interaction with other players within the game.

Researchers also paid attention to the impact of RPGs on players. Some studies found that many players spent much time playing RPG games and enjoyed virtual social life. Game addiction could be seen among many game players, because "repetitive playing results in dopamine release in the nucleus accumbens just like the other addictions do" shown by clinical researchers (Mitchell, 2000). Too much devotion to the game world replaces real-life social interaction, which can be harmful to their real social engagement and development (Allison, et al., 2006). On the other hand, some investigators pointed out the positive impacts of role-playing games. Peterson (2016) made analysis that MMORPG could engage collaboration, assistance, and co-construction with language dialogue within in-game and external communities. RPGs could enrich their social experiences and improve social skills as the game opened different perspectives on social life and players could enjoy what they could not access in real life (Chen & Duh, 2007; Ducheneaut & Moore, 2005). The experience of a virtual community could decrease their social anxiety, depression, and loneliness and increase their satisfaction, autonomy, competence, and relatedness (Allison, et al., 2006). It was also found that RPGs could help advance players' problem-solving skills, critical thinking, creativity, and collaboration (Cole and Griffiths, 2007; Dickey, 2007). It facilitated the expression of "self"

by creating a new character in the game world. For example, they could choose a new identity and develop an ideal version of themselves by dressing in different clothes, having new skills, taking certain actions, and doing magic things which is in contrast to their everyday experience (Young, 1998).

2.2 Value Co-creation and Affordance in Video Games

While the S-D logic provides the appropriate soil for the emergence of value co-creation, The continuous development from the traditional product market to the service market and relationship market motivated plenty of enterprises for applying service-dominant logic in the service industry and improving the customer's value co-creation experience (Grönroos,1978). In fact, many scholars have published their research about the customers' value co-creation experience in the context of the video game industry based on previous value co-creation research: Hussain et al. (2022) developed Verleye's (2015) theory structure of the six dimensions of customer's co-creation experience, which consists of hedonic, cognitive, social, personal, pragmatic and economic experience (Verleye, 2015,p. 326). Based on the established 6 aspects system for evaluating customer co-creation experiences, Hussain et al. (2022) combine super functionality, competition, sociability, personalization, and self-indulgence as 5 dimensions of the new system for evaluating the customers' value co-creation experience between freemium and premium contexts, and a quantitative approach was applied as the method of collecting data (sending questionnaires of the evaluating system to 346 online players) (Hussain et al., 2022, p.3). Grohn et al. (2017) adopted the ethnographic approach for analyzing the essence of value co-creation via co-creation experiences in the online gaming context; from the perspective of the game itself, they discovered the crucial elements in games that might affect players' value co-creation experience: gaming technology, connective environment, customers' role readiness and the nature of interaction (Grohn et al., 2017). Afi & Ouiddad (2021) applied uses and gratification theory that strived to provide an understanding of users' endeavor to fulfill particular needs (Afi & Ouiddad, 2021, p.372) for examining the factors that can impact the players' engagement in value co-creation within the online video games (Afi & Ouiddad, 2021), it was finally discovered that the personal and social motives positively act as the key factors of influencing customers' participation in value co-creation activities (Afi & Ouiddad, 2021). Gidhagen et al. (2011) mainly claimed to offer an experimentally supported framework of value co-creation, along with insights into its realization from the video game firm perspective, and identified the function of firms in

promoting value co-creation throughout the whole process (Gidhagen et al., 2011). Furthermore, Wang et al. (2020) emphasized the impact of the video game's premium institution on the value co-creation of players, and also referred to the particular consumption value framework in the circumstance. These studies provided the relevant theory supporting and relevant models for us to explore more on the players' value co-creation experience in RPG circumstances.

In the area of video games, affordance influences the responses or actions players can take in a certain game environment. Video games are making use of the development of computer science and digitalization, and also inevitably considering the relationship between the technologies of games and the players themselves. Based on Gibson's thought of affordance, action affordances were defined by Hunicke and Zubek (2004) as various actions and mechanisms offered to players in a game, or simply speaking, actions that players can have in a game context. Eden et al. (2018) identified "affordance to be the behavior that virtual or game environment allows players to enact". Some scholars concluded a model of general motivations to play games to explore how games motivate players to play for fun or joy. The model of situated motivational affordance was described (Deterding, 2018) as the possibility of meeting players' demands through the relationship between objects and player's capacities in certain situations. Scholars also focused on some groups of people, for example, children's video game play. The following affordances were proposed in kid's gameplay: portability, accessibility, interactivity, identity multiplicity, sociability, and perpetuity (Jiow & Lim, 2012). Jónasdóttir and Müller (2020) indicated four affordances in the video game industry on the basis of an empirical study and previous studies, which include tool development, prototyping, user testing, and patching. Their study linked the affordances of technology to the process of development and innovation of video games in an organizational context.

It has not been found in any former research about the influence of the perceived affordance by players on their value co-creation process in the video game area. But it is discovered that many scholars have investigated the relationship between affordance and value co-creation in the service industry environment, some with the intention of researching the perceptible affordance's influence on the customers' value co-creation experience in the servicescape, which refers to the influence of physical surroundings and environment in service interactions (Bitner, 1992). Guo et al. (2021) embarked on exploring the intrinsic mechanism of corporate digital enablement using affordance theory, investigating its potential to enable customers to

participate in the value co-creation experience. The study proves the positive effects of affordance on customers: product affordance drives customers' initial inclination to partake in the value co-creation process in four aspects: economy, reliability, uniqueness, and selectivity; while the visibility, convenience, association, and persistence that construct the platform affordance also bolster users' ability to effectively engage in value co-creation; Lei et al. (2019) had also found that the hoteliers' understanding of mobile technologies as the affordance in the hotel context may also contribute to the positive customers' value co-creation experience; Apostolidis et al. (2021) investigated the ways in which mobile applications focused on food waste mobile application can facilitate sustainable value co-creation at the base of the pyramid, and the respondent's perception of the application functions formed the affordance in this servicescape. The research finally certified that the correct understanding of affordance establishes the essential to develop sustainable value co-creation. Actually, the number of previous studies conducted by scholars on the impact of affordance on value co-creation experience in the service circumstance is not large, but the research discovered by the authors mostly explains the positive correlation between affordance and value co-creation: the suitable affordance perceived by customers can build a basis for achieving the value co-creation experience.

As a result, the former research about video games, value co-creation and affordance could see a big gap in research that is stated in the problematization section, which largely motivates us to dig more into the influence of affordance brought to players' value co-creation experience in RPGs.

III Theory

A game has to be designed to cater to the needs of potential players. It is a complex field involving a wide range of various facets in design and multi-disciplinary fields of expertise (Braad et al., 2016), which needs the contribution of designers, developers, researchers, other stakeholders, and even players.

As players have been increasingly considered as the center, research on game experience, or player experience is prominent. Player experience is a core factor in game design which covers everything in a game (Zubek, 2020). The design of players' experiences is incorporated solely to enhance the value-in-exchange from Goods-dominant Logic, neglecting the value derived

from the player's perspective and their individual capabilities and choices (Vargo & Lusch, 2008). Some research regards player experience as user experience in the concept of computer science. It is about the interaction between software and players by considering players' emotions and attitudes, owing to the development of computer science (Wiemeyer et al., 2016). In this paper, player experience is studied from the perspective of players' value co-creation experience. As player experience involves the personal perception of the interaction between player and game (Gerling et al., 2011), affordance has also been proposed as an important factor in user experience design and user-computer interaction, and is an important game environment where players and game providers interact for value co-creation process (Grönroos and Voima, 2013). Thus, affordance theory and value co-creation theory consist of the theoretical foundation of this paper.

3.1 Value Co-creation

The value co-creation theory was first raised by Vargo and Lusch in 2004, in their new approach, service-dominant logic (SDL) (Hussain et al., 2023, Vargo & Lusch, 2004). Service-dominant logic originated from good-dominant logic, which believes that value creation is exclusively associated with the production process, and values are perceived as intrinsic to the product (Karababa & Kjeldgaard, 2014). Yet in the phase of SDL, Vargo and Lusch (2004) emphasized the importance of service as the core medium to deliver value between the firms and the customers, and services and competence construct the fundamental basis of exchange. This process is connected with the service experience of the customers and the intangibility of the services (Vargo & Lusch, 2004; Grönroos, 2017). It challenges the GDL idea that value is only created by providers as value-in-exchange, and emphasizes value-in-use where customers can make use of all resources offered by providers, create personal value propositions and shape their own meaning and significance of their experience during the service. (Karababa & Kjeldgaard, 2014; Vargo & Lusch, 2008) So, different customers may perceive different values and have various value co-creation experiences as the value is not inherent in goods, but is determined by service that provides value in use (Vargo & Lusch, 2004).

In the video games industry, goods-dominant logic is widely applied because it is sold in the form of physical products, like cartridges or discs, shipped in boxes to players. With the development of online video games, no physical game products are needed for players to purchase, and the concept of Games as a Service (GaaS) has been introduced, marking a

significant evolution in the gaming industry. This approach goes beyond merely delivering games to players and extends to providing them with continuous and enriching experiences along with a range of supporting services (Gebauer et al., 2005; Hussain et al., 2023). Therefore, the service-dominant logic (SDL) represents an alternative framework to the traditional goods-dominant logic (GDL) and can be used as a paradigm for comprehending the dynamics of services in the video games industry. It provides a distinct perspective on how value is created through exchanges involving a diverse array of actors (Vargo & Lusch, 2004).

Value co-creation is deemed to happen through the interaction between the game companies and players in the service environment, namely video game platforms. SDL directly accelerates the change of customer's identity in the value-creating process. In comparison with players' function merely as the passive receivers who are involved in the game company's producing processes and only assist in the company's own value creation, the value is co-created by involving players in experiences who act as the momentous co-creators of the value (Skålén, 2018; Vargo & Lusch, 2008). Players are playing the roles of creating the value-in-use by integrating resources, while games companies lose the dominant status of value-creating and undertake the responsibility of providing players with value propositions and aiding players to create value and integrate resources (Skålén, 2018; Vargo & Lusch, 2016). Developed from Vargo and Lush's SDL, Grönroos and Voima (2013) introduced a new perspective on value co-creation, offering a comprehensive breakdown of the value creation process and the roles of each actor involved. Three spheres are entailed to explain the process of value co-creation, including the provider sphere, the customer sphere and the joint sphere. In the provider sphere, game companies are regarded as value facilitators in the developing game world. In the customer sphere, players create independent value and blend their experiences derived from the resources provided by the game company with the results of their interactions within the joint sphere. Joint sphere happens when players and game firms interact and co-create value together. (Grönroos & Voima, 2013) In the Joint sphere, players interact with the video game company through the gaming platform, utilizing the affordances. Affordance pertains to the game environment with clues and hints that allow players to act accordingly and interact with the game world at will (Gibson, 1979; Grönroos & Voima, 2013), which will be further elaborated in the next section.

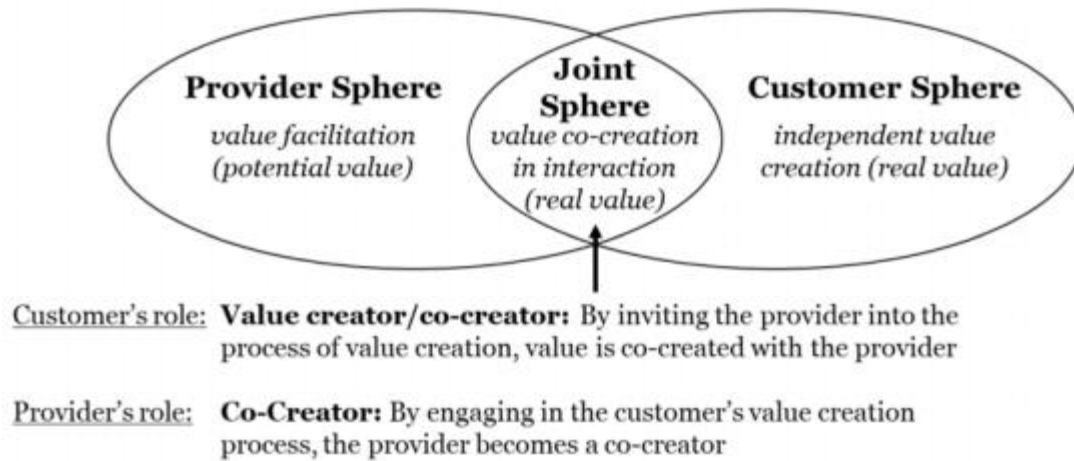


Figure 1. Value creation spheres (Grönroos & Voima, 2013)

This thesis explores players' value co-creation experience in RPG games. For relevant and good data collection and analysis, Hussain et al. (2023) 5 dimensions model will be utilized to evaluate the players' value co-creation experience in Fallout 76 gameplay, including super functionality, competitiveness, sociability, personalization, and self-indulgence five aspects. Hussain et al. (2023) also explained these dimensions in detail in their research: Super functionality represents the extent to which in-game paid content provides players with relatively advanced features and additional services on top of the existing game formats (Hussain et al., 2023); competitiveness on behalf of the overall competitive atmosphere and the high level of gaming experience that customers are seeking in their games (Hussain et al., 2023); sociality refers to the social features of in-game services that provide social interaction, group play involving collaboration, and interpersonal gift giving within the game environment (Hussain et al., 2023); personalization is defined as the ability of superior content in the specific game to allow players to customize their gaming experience (Hussain et al., 2023). As to the self-indulgence dimension, its original definition is the extent to which the in-game content evokes feelings of pleasure, satisfaction, and other hedonic emotions associated with play (Hussain et al., 2023).

Because of the Hussain et al. (2023) model's superiority in estimating players' value co-creation experience, this model is drawn on by the study to comprehend our findings. However, this study has discovered other values not covered or partially covered by the model, e.g. a series of emotional experiences and values created and gained by players except self-indulgence, and self-development values going beyond competitiveness. The various

dimensions in Hussain et al. (2023) model are also restricted to the players' intrinsic values co-creation experience they gain for themselves. Yet, extrinsic co-created values, like collaborations among players and between RPG manufacturers and players also occupy a momentous status in players' value co-creation, which hasn't been adequately demonstrated in Hussain et al. (2023) model. Therefore, this thesis develops and enriches the Hussain et al. (2023) theoretical model for better analyzing the players' value co-creation experience.

3.2 Affordance

Gibson (1979) put forward the concept of affordance which was offered by a certain environment to perceivers to act based on their physical and perceptual capacities, either for good or not. It is so significant because he believes that affordances play a central role in perception and action. He argued that perception was not passively receiving sensory information, but actively engaging with the environment and seeking information to meet demands. Affordance is not an objective property of the environment but a process of perception of perceivers according to their experiences and goals (Gibson, 1966, 1979). However, it is mainly popular in the field of psychology. Some experts extend its use to other fields for a broader application, especially in design and human-computer interaction (HCI).

Norman (1988) connected affordance with design and suggested it could be highly used in the design, as it offered strong clues for actors to operate. He defined affordances as “the perceived and inherent properties of the thing, primarily those fundamental attributes that dictate just how the thing could possibly be used”, and applied affordances theory to the design of products and interfaces with a model of user-centered design. (Norman, 1988, 2013). Later on, more researchers found a connection between technologies and humans based on the theory of affordance. It is quickly spreading in the field of research, education, and application of HCI which is a part of interaction design. Affordances are considered as an interaction between actors and technology, instead of being considered separately, and are the relationship between technology and knowledgeable humans, or in other words, the capability and human demands (Bygstad et al., 2016; Majchrzak & Markus, 2012). McGrenere and Ho (2000) conducted further research on the use of affordance in the HCI field and put forward the concept of “degree of affordance” and “functional hierarchies of affordance.” They argued that affordances were not restricted to physical interaction with computers and their function did not end with physical parts of devices, like mouse and keyboard. The software also offers possible actions,

such as a word processor that presents editing options, but also clicking and dropping. They also advocated a separation between affordances and perception, to make two aspects of design clear, which were designing the utility of a system (affordances) and designing usability (information specifying the affordance) (Kaptelinin, 2014). Hartson (2003) concluded four types of affordances, namely cognitive, physical, sensory, and functional affordances to specify the function that affordances had in helping users in interaction and the action that the user could take in performance. He thought in Norman's research, the perceived affordance was cognitive affordances and real affordances were physical affordances. Sensory affordances support the user's sensory action and functional affordances connect usage to usefulness.

In the video games industry, HCI is also an inevitable part of game design, as it involves the player's interaction with the interface of the game world. Affordance, correspondingly, is highly relevant which influences the design and player's experience of the interactive digital world. Affordances in video games refer to the clues, hints and opportunities that the video game environment provides, facilitating players to perceive and understand game mechanics and engage with the digital game world (Norman, 1988). Affordance plays a crucial role in nurturing a player's interaction with the game world. Besides, in service-dominant logic, value is co-created in the interaction between players and game providers, and the player-game interaction offers an opportunity for game providers to influence players and co-create value with them (Grönroos, 2020). Game companies strive to apply good design and affordances to guide player's interaction with the game. Preece, et al. (2015) implied that interaction design heavily relied on affordances and a proper attribute of an object, like an interface, allows players to be easy to understand and take action. This included elements such as buttons that hinted at their functionality, environmental cues that indicated interactive elements, and affordances related to character actions and actions. "When the affordances of an object are obviously perceived, it's easy and straightforward to know how to interact with it". It has been treated as a key concept in HCI research as a basic design principle in HCI textbooks (Preece, et al., 2015).

In this paper, Gaver's model (1991) is used as the theoretical model because this paper would like to explore the technology affordances of the digital game interface in Fallout 76, in the context of human-computer interface (HCI). Features and properties of Fallout 76's interface, for example, buttons and icons are studied and analyzed to see how players perceive these

affordances and take actions accordingly. Perceptible affordances, false affordances, hidden affordances and correct rejection are referred to in this model.

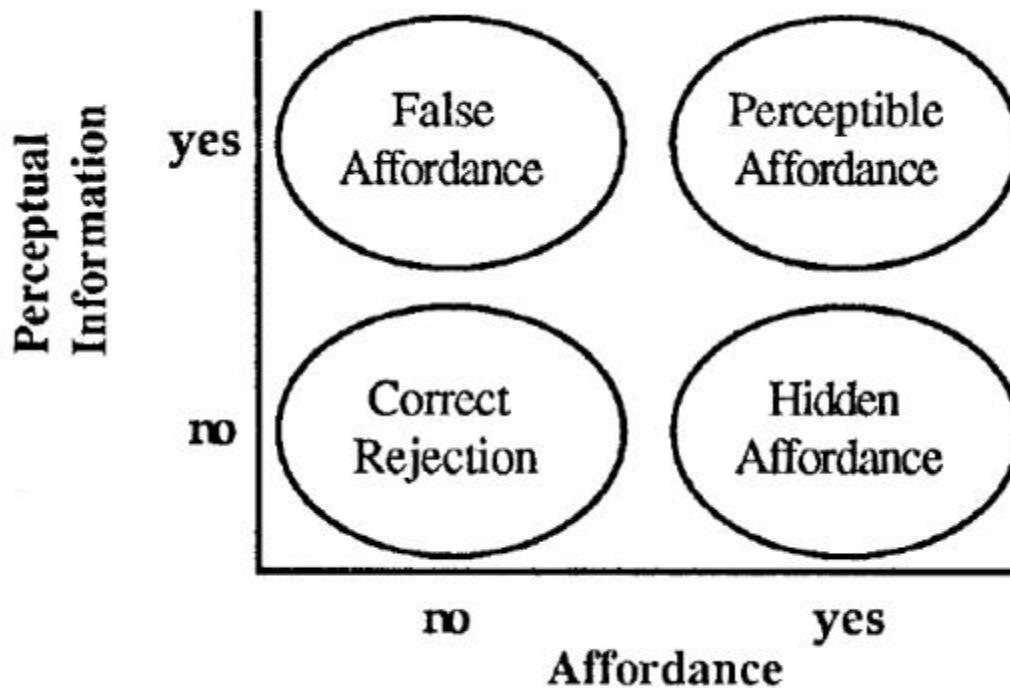


Figure 2. Technology affordances model by Gaver (1991)

Perceptible affordances refer to the characteristics of an object or interface that shows available and apparent information that could be easily perceived by users. These features offer direct signals so that users know how to use it and how to interact with it. In video game design, perceptible affordance is crucial in giving players a clear understanding of the game, mechanics, and navigating players to interact within it. False affordance occurs when an object suggests a particular functionality or interaction, but the use or functionality does not work or does not exist. In other words, players perceive the function or action of a certain affordance, but the obvious affordance does not have a real function and does not support any action that mislead the player. For example, a non-functional button in video games that looks like it should perform an action but does nothing when clicked would be a false affordance. It provides a wrong clue to players and makes players act accordingly but without any responsive result. Hidden affordances happen when an object has no immediate functionalities that are visible or notable to users. It means that affordances exist for interactions or actions, but are not obvious to players and are not perceived by players. Correct rejection refers to a context where users correctly identify that there is no available or applicable affordance in an object or system.

They knew certain functionalities of a system or object did not exist or were not supportive, so they did not attempt to use it. Correct rejection is not applicable in this thesis as it indicates that there is no affordance and the player is not aware of it which we cannot collect and analyze in interviews.

The study does not only focus on objective affordance design provided to players, but also explores players' subjective factors influencing their experiences, as both players and game providers involve and interact which is also consistent with value co-creation theory. Player's perception capacity is discovered to be a factor related to their value co-creation experience. Besides, we further develop the model of Gaver (1991) in analysis, where ambiguous affordance and superior affordance are proposed to be good affordance design together with existing perceptible affordance, as opposed to bad affordance design which is composed of hidden affordance and false affordance.

IV Research Design

This thesis generally conducts the research design with six procedures: first, ensure the appropriate research approach and research philosophy of the thesis, and then operate data collection and sampling regarding the target group. After acquiring enough data, the thesis adopted relative methods for analyzing the data, while the ethical reflection will also be articulated in this chapter, which includes the ethical principles that the authors have conformed to in the data collection and analysis, such as asking for the permission of interviewees before recording the interview.

4.1 Methodology

4.1.1 Qualitative Approach or Quantitative Approach?

A combination between the quantitative approach and qualitative approach for the research was originally considered. Nevertheless, based on the discussions and the progressive proceeding of research design, it is gradually discovered that the quantitative approach is relatively not appropriate to the research questions and the research theme: firstly, a significant character of the quantitative research approach is the collection of numerical data (Bryman, 2016, p.147), yet Fallout 76 is an influential game with the broad audience worldwide: the Fallout 76 Instagram official account has over one million followers (Instagram, 2023), and the Fallout 76 topic has 153k followers on Facebook (Facebook, 2023); on the Chinese social platform Baidu Tieba, Fallout 76 has 57,300 followers, with a cumulative post count of 3.6 million (Baidu Tieba, 2023). As a result, these statistics reveal the huge amount of Fallout 76 players in different areas (even continents), hence merely several hundred samples won't be enough representative and sizable to generally describe and reflect the thoughts and understanding among these Fallout 76 players in different regions and countries.

Besides, in quantitative research, it is a necessary step to convert the data into numbers by coding after collecting the data to facilitate quantitative analysis of the data (Bryman, 2016, p.150). In order to improve the efficiency of the coding process and the conversion of data into numbers, the researcher normally adopted questionnaires and structured interviews that construct the most commonly used methods in quantitative research (Bryman, 2016). Moreover, they administered almost the same questionnaire and structured interview questions to each participant in the quantitative study (Bryman, 2016), and the answers mostly consisted of fixed

options and the Likert Scale, which indicate a set of attitudes related to a particular domain for understanding the respondent's level of agreement with the statement (Bryman, 2016, p.155). The application of the Likert Scale and fixed options may increase the efficiency of data collection, coding, and data analysis on the one hand; nevertheless, the rigid nature of the questionnaire answers leads to the collected data answers showing a high degree of similarity (Bryman, 2016, p.168); while the participants' opinions have the bigger possibility to be expressed within semi-structured interview context in comparison with the structured interview (Flick, 2018, p. 150). For a deeper understanding of players' subjective experiences and perceptions of RPG games, qualitative method, like semi-interviews, can offer the flexibility to delve into the intricacies of player-game interactions and capture the diverse range of meanings and interpretations that players attribute to their experiences. It helps uncover the underlying motivations, emotions, and social dynamics that shape players' interactions with the game world. Therefore, this thesis finally adopts a qualitative approach to the research, and the inductive approach is also utilized in this qualitative research. Compared with the deductive approach, which is "usually associated with the quantitative research" (Bryman, 2016:21), the inductive approach is relatively suitable in qualitative circumstance (Bryman, 2016).

4.1.2 Research Philosophy

In the aspect of delving into the philosophical foundation to support the research design, the dissertation firstly adopts the epistemological stance for this qualitative research. Furlong and Marsh (2010) affirm that there is general agreement on the meaning of epistemology (Kant, 2014). As an influential branch of philosophy concerned with knowledge, epistemology studies theories of knowledge, including how knowledge is derived (for example, by reason or experience, which may both take various forms and the reliability and validity of knowledge claims (Kant, 2014, p.69). The epistemological stance is also concerned with what should be considered as acceptable knowledge and how can people learn the knowledge in social reality (Bryman, 2012).

Within the system of epistemology, there are two opposing research paradigms, positivism and interpretivism. Positivism advocates the utilization of natural sciences' approaches to specific social science research, and an essential principle of this paradigm is that relative research is supposed to be conducted in the way that value is free (Bryman, 2012, p.24). However, the authors execute the semi-structured interview as the main data collection method for collecting

the different players' diversified comprehensions of their perceived affordance and value co-creation experience, and the clarifying, comprehension, and interpreting of the data after collection will also with the basis of the author's perspective, which is clearly contradicted with positivism's principle of value-free throughout the research (Bryman, 2012). On the other hand, interpretivism asserts that humans construct knowledge as they interpret their experiences in the world, implying that knowledge worldwide is rooted in our specific experiences, it is subjective and is closely linked to the natural contexts in which we enact our lives (Hiller, 2016). The subjective character of interpretivism leads to the distinctiveness of the interpretive knowledge, which is imbued with our personal values, and local and political perspectives (Hiller, 2016, p.103). Hence, interpretivism is more suitable to this research because of its emphasis on the interpreters' value, knowledge and the importance of comprehending and interpreting the different meanings and experiences of individuals and social groups within their particular social and cultural circumstances (Pham, 2018). In addition, interpretivism is particularly relevant in qualitative and inductive circumstances, where researchers seek to explore and interpret subjective experiences and meanings rather than focusing on objective, measurable phenomena (Pham, 2018). Therefore, the appropriateness promotes us to erect the interpretivism philosophical framework from the epistemological stance in research design.

4.2 Data Collection Methods

One author of the thesis has years of experience playing Fallout 76 and RPGs. This hands-on experience and participation provide a deep understanding of the game's dynamics, mechanics, functionalities and the community of the game. This situation offers authors the occasion to utilize similarities and continuities between their own experience and the experiences of interviewees, thus facilitating a better understanding and empathy for the subject of investigation (Pink, 2015).

Drawing inspiration from this personal involvement, various online platforms related to Fallout 76 are explored, such as Instagram, Facebook, and Baidu Tieba, in order to gather insights from these online communities. The direct and indirect experience within the game environment informs a great understanding of the players in these online spaces, enriching authors' perspectives on the Fallout 76 game.

Due to the above experience and draft information observed, this paper takes the method of interview as data collection and analysis. As an important component of qualitative research

methodologies, the interview has become a vital methodology of data collection procedure for scholars to conduct in qualitative research design, which can be differentiated into structured, semi-structured, and unstructured interviews by their level of structure (Flick, 2018). From the function of the methodology, interviews allow scholars to study the subjective perspectives of different social groups (Flick, 2018), and interview also constructs a way to express and reveal the existing knowledge that respondents have had about the research theme in the form of answers that can be interpreted (Flick, 2018, p. 160).

For the design of the thesis's interview questions, this paper designs 19 questions and divides them into two parts: the six interview questions in the first part consist of semi-structured and structured interview questions, which are relatively simple, aiming to understand some basic information about the interviewees (such as the personal information and the interviewees' general game experience, etc.); while the other fifteen interview questions in the second part are designed to convert the theories in the thesis, including affordance and value co-creation, into easy-to-understand terms and to combine them with the interviewees' personal gaming experience; the questions are also basically composed of semi-structured interview questions that have the characters of open-ended and allowing for flexibility of interviewees' replies to some extent (Flick, 2018). In reality, the authors interact with all 15 interviewees in advance to ensure that the interviewees' Fallout 76 gameplay experience is sufficient to support the whole interview (all respondents had more than one hundred hours of gameplay time of Fallout 76).

4.3 Sampling

Sampling is essential in academic research, involving the selection of a group of individuals, objects, or activities from a larger population (Bryman, 2012). This study aims to get insights into the affordance and value co-creation experience among game players of Fallout 76. Without using random sampling to choose participants in a general scope, a non-random sampling technique, purposive sampling was employed as a non-probability way of sampling aiming to screen respondents who are highly relevant to the research questions (Bryman, 2012) Thus, participants have been purposively selected according to our research purpose and their knowledge, experience, and expertise related to the research question (Silverman, 2013). This made us recruit participants who were most likely to offer valuable and relevant information to our study. According to Flick's (2018) statement of a "good informant", all participants in

the study possessed the required knowledge and expertise related to the subject, had the ability to think deeply and communicate effectively, were available for interviews, and were willing to take part in the research.

Interviewees	Gender	Age	Vocation	Year of Game Play	Hours of Fallout 76	Favorite Category	Interview Duration
1A	Male	20-25	Student	10	323	RPG	56 minutes
2B	Male	20-25	Worker	6	550	RPG	44 minutes
3C	Male	20-25	Student	20	1500	RPG/manscaped	66 minutes
4D	Male	30-35	Worker	27	3000	All kinds/RPG	64 minutes
5E	Male	40-45	Worker	27	300	Strategy/open world	55 minutes
6F	Male	20-25	Student	17	1600	RPG/Action/Strategy/Adventure	61 minutes
7G	Female	20-25	Worker	11	200	Simulation	65 minutes
8H	Male	25-30	Worker	13	1000	RPG	50 minutes
9I	Male	25-30	Worker	20	257	Adventure	69 minutes
10J	Male	25-30	Worker	20	840	RPG/War	103 minutes
11K	Male	45-50	Worker	20	3000	RPG	53 minutes
12L	Male	30-35	Worker	25	500	American RPG	64 minutes
13M	Male	20-25	Student	10	1500	Shooting/Open World	82 minutes
14N	Male	25-30	Student	9	600	RPG/Action	50 minutes
15O	Male	30-35	Worker	11	800	Strategy/Adventure	61 minutes

Table 1. Interviewees' profile

To ensure that we selected the most relevant participants for our study, we posted interview invitations to relevant online platforms, such as Baidu Tieba, QICQ Chat Group, Steam, NGA, and Bilibili. Based on the sampling framework of Flick (2014), participants should be closely relevant to our study, so the invited participants should have an understanding of the game Fallout 76, be able to reflect on their experience, and articulate their thoughts and feelings about the game, are available for interviews and are willing to participate in the research. We haven't set too strict criteria on the participants' backgrounds to ensure diversity among the participants. Diversity in the sample assures variety and ensures that research findings could reflect the experience of a wide range of participants, rather than a particular group or demographic. (Bryman, 2012).

Furthermore, to make the sampling process as convincing as possible, we had a talk or message chat with potential interviewees before official interviews. This way allowed us to build a close relationship and trust with the interviewees, creating a comfortable, relaxed and open atmosphere during the interviews (Flick, 2018). By doing so, we could obtain more detailed information from the interviewees and ensure the credibility and accuracy of the study.

4.4 Data Analysis Method

Our research followed a case study approach, using interviews as data collection methods, and analyzing the data as it was collected. Since the composition of qualitative data is mainly text-based, operating the data coding for the purpose of data analysis becomes essential (Hilal & Alabri, 2013). Miles and Huberman (1994) defined coding as “marking and labeling that assigns units of meaning to descriptive and inferential information collected during the research process” (Miles & Huberman, 1994). The process generally consists of finding relevant words and phrases in a document and combining these words and phrases to understand their connections. Firstly, the general coding of this dissertation adopts the inductive coding mode (Chandra & Shang, 2019). Since this study utilized semi-structured interviews as the interview format, and most of the interview questions were open-ended questions, so it's almost impossible to know which direction the conversation would flow. This means the main coding pattern in data analysis is still developing the coding based on what was discovered in the interview process. Therefore, the process of continuous coding accompanied by data collection constitutes the inductive coding mode in this research (Chandra & Shang, 2019). Furthermore,

due to the qualitative peculiarity of this study, we did not mention the specific theories and related models that are used in this study to the interviewees during the interviews.

Then the specific coding process of this study consists of two procedures. In the initial coding procedure, all data from the collection procedure was overviewed by reading through it to understand the essence of the whole text and execute the broad coding. We generally applied the combination of In Vivo Coding and Structural Coding in the initial coding section. For the huge dataset collected through interviews in this study, we divided the interview data of 15 respondents into different components through structural coding, keywords such as “design elements”, “experience” and “value” became important labels for us to divide the huge dataset into different parts (Van der Helm, 2016). Then we used In Vivo Coding after dividing the whole data into different sections, which honors the words of interviewees, as our interviewees heavily interspersed their answers with characteristic discourses from the RPG culture circle, and even merely from the Fallout 76 communities. The adoption of In Vivo Coding not only emphasizes the actually spoken discourse of the participants but also be especially helpful when researchers interact with respondents from the specific culture circle to help underline how those interviewees use specific discourse in the whole communication that might not be understood when scholars applied other coding approaches (Saldaña, 2016; Manning, 2017). After completing the preliminary coding, axial coding is used in this study to aggregate the fragmented data and categorize the data into more particular and interrelated categories (Williams & Moser, 2019). In the process of axial coding, this study identified larger themes related to the research question and the data that became fragmented after the initial coding were linked through these themes (Williams & Moser, 2019). For example, we associate the theme of perceptible affordance with icons, task instructions, text, etc. The axial coding as the second procedure of the specific coding achieved the connection among these themes and the fragmented data that promote us to more easily comprehend the data and be convenient to the analysis chapter writing.

In addition, all the data related to existing theories are summarized in the whole coding process of this paper. On the other hand, the data provided by the interviewees in the interview process, which is not related to the existing theory, has also been analyzed and interpreted in the context of the interpretivism paradigm, and it constitutes an important part of the findings of this study and enriches the existing theory. In general, we gained a deeper understanding of the affordance and value co-creation experience among game players of Fallout 76 through the data analysis

process. The findings were triangulated across the different data sources to ensure validity and reliability.

4.5 Ethical Reflections

Throughout the study, ethical principles were followed to ensure that the research was conducted without causing harm to individuals and to improve the quality of the study. It was assured in terms of informed consent, confidentiality, and appropriate handling of recorded data (Bryman, 2016).

Initially, we ensured that the participants in our study provided informed consent before we collected any data or recorded any interviews. It was imperative that the participants were aware of the purpose of the study, the interview format, and the intended use of their data. We then obtained their permission to use their responses and background information. All participants voluntarily participated in the study and were informed that they could refuse participation at any stage of the study.

Additionally, the General Data Protection Regulation (GDPR) was adhered to in terms of data collection, usage, and storage for ethical data practices. The processing of data was clearly stated and consent was obtained from participants. It was secured to collect only relevant, limited, and accurate data for this study and participants had the right to delete their data. The privacy of the participants was protected by avoiding any questions that probed into their private information during the interviews (Bryman, 2016). We strictly complied with GDPR by utilizing anonymous methods to protect the personal information of respondents from exposure. We ensured that confidential information remained undisclosed and that sensitive information was deleted or kept anonymous. To protect their identities, we used symbols or deleted any sensitive information. So, their real name and sensitive personal information would not be exposed in the study (Flick, 2014). Consent was obtained from interviewees for the use of their transcriptions, and any sensitive information was removed from publicly available data to protect the privacy of the individuals involved. Besides, we securely stored all interviewee data, including basic information, audio files, and transcriptions, which were only accessible to two of the authors.

For the online observation, we took great care to avoid causing harm to any relevant individuals or companies. Since the information was publicly available, we did not need to obtain official

consent. Any sensitive information was removed from the data to protect the privacy of the individuals involved.

V Analysis

5.1 Value co-creation experience

5.1.1 Various Values Co-created in RPG Games

Hussain et al. (2023) provided a model for game value co-creation experience including super functionality, competitiveness, sociability, personalization, and self-indulgence, which is drawn on by the study to comprehend our findings. However, this study has discovered other values not covered or partially covered by the model. Therefore, to further develop the theory, we proposed 7 value co-creation experiences in RPGs, consisting of emotional value, self-development value, sociability value, personalization value, super functionality value, community building value, and creative collaboration value.

Emotional value

In the value creation model proposed by Hussain et al. (2023), “self-indulgence” is regarded as an integral part of the value co-creation experience. However, through analysis of players’ perspectives, it is found that this concept does not fully cover the emotional experience players gain in games. Therefore, we choose to use “emotional value” instead of “self-indulgence” to more fully describe the emotional experience of players in the game. Emotional value refers to the various emotions and feelings that players experience during the game. It is one of the important factors that affect players’ gaming experience and value creation.

First of all, players can enjoy a pleasurable value co-creation experience in the game. According to analysis, the art design of the game, providing the aesthetic feeling, directly affects the emotional experience of the players. This is also in line with the servicescape concept in service-dominant logic, which regards that the service environment will have an impact on players (Mary Jo Bitner, 1992). The game world is a digital service landscape, where the art design and landscape of the game will directly affect the player’s personal behavior, interaction and experience (Ballantyne & Nilsson, 2017; Mary Jo Bitner, 1992). The overall aesthetic level of the game affects the player’s gaming experience. Good art design can bring beauty to players, including the art of in-game textures, and shape the entire game environment. It will have a psychological or visual impact on the player’s gaming experience, and influence their emotional feelings. For example, some players mentioned that Fallout 76 has made great

improvements in art design. Players can enjoy very beautiful scenery in some places, and can even take screenshots of the scenery as their desktop wallpaper. In addition to the beauty of the game's own art design, players can also feel the creativity of other players, such as appreciating camps and architectural works created by players from different countries and cultures, thereby gaining pleasure from different visual and artistic impacts, making this virtual world more real and beautiful. Game aesthetics and artistic appreciation are presented visually in the game, arousing players' perception and appreciation of the game's aesthetic and artistic value, becoming part of their emotional value.

However, this research also finds that RPG games are not limited to feelings of pleasure, satisfaction, and other hedonic emotions, concluded as self-indulgence in Hussain et al.'s model (2023). The biggest difference between RPG and other games is that players can get emotional experiences related to the game plot, tasks, and themes. As interviewee D said, "RPG games are an important form of expression of the ninth art. Just like reading a novel or watching a movie, you will see many details, including the expressions of the actors and the foreshadowing of the story. When you see it, you will get touched. Players' exploration and plot interaction in the game can bring such emotions to players." As a wasteland-theme game, *Fallout 76* has a very complete theme, background and worldview. Players can experience a living state in this wasteland world and different emotions during the game. For example, players may experience negative emotions such as tension, fear, sadness, etc. in the game. These emotions often originate from the challenging, thrilling atmosphere or touching stories brought by the game design. If the character controlled by the player dies during the game and the garbage that the player has worked so hard to pick up will disappear, the player will feel very uncomfortable and will have a great sense of frustration and disappointment. The nuclear bomb warning voice in the game is very realistic, making players feel a strong sense of tension when hearing the nuclear bomb warning, and they will evacuate quickly. When they see the notes or diaries left by an NPC, they can read about what the NPC has experienced, which may bring them feelings, sadness or regrets. These different emotional experiences make players' gaming experience richer and deeper.

"What impressed me deeply is that the place where every player is born is in Vault 76. This Vault feels like a location in some horror movies. It is a closed space in a very empty area, and there is no one else. No one tells you what happened here, and you don't know where the people around you have gone, or what is going on outside. This spreads a feeling of unknown and

powerlessness. Then I left with this unknown in Shelter 76, I felt very shocked when I came to such a large world of Appalachia. But then I encountered some robots from the red camp, who shot me with lasers and chased me all over the ground. During the process of going down the mountain, the surrounding environment was more eerie and the overall darker forest scene made me more nervous. These emotions occurred in a short period, and the game's environment and plot design gave me ups and downs. It feels like a shocking wasteland experience.” (Interviewee H)

This is a vivid showcase that players can experience more various feelings and emotions in RPG games, and co-create the emotional value in the game world.

In general, emotional value is created jointly by the game's design and players. Through its carefully designed art, plot and worldview, the RPG game allows players to immerse themselves in the virtual world and feel the emotions of the characters. In addition, players' exploration, creation and interaction in the game also make important contributions to the co-creation of emotional value, enriching the game experience and allowing players to experience more diverse emotions.

Self-development value

This research finds that self-development value is an important part of the co-creation experience, stimulating players' personal development through competition, technology, creativity, etc. This gives players a sense of achievement and satisfaction. The value of competitiveness is mentioned in Hussain et al.'s model (2023), but it cannot fully describe the sense and value of accomplishment that players hope to gain in the game. This study discovers aspects of obtaining achievement and satisfaction besides competitiveness and proposes a new concept, namely, self-development value.

Self-development value refers to the space for players to develop during the game. This value not only focuses on the improvement of game levels and competition, but also emphasizes that players achieve personal development in terms of technology, strategy, creativity, etc.

In video games, competitiveness is an element that cannot be ignored. By challenging other players or tasks set by the game, players can experience continuous breakthroughs and improvements in their abilities in the competition. In multiplayer online games, players gain

achievements by defeating other players and completing difficult tasks, thereby feeling the sense of competitive accomplishment. This kind of competition inspires players to pursue excellence and challenge themselves, making the game a platform for realizing the value of self-development.

But beyond competitiveness, this research uncovers many other aspects to realize the self-development value among players. Skills improvement is a manifestation of improving self-development. By accumulating game time and practicing challenges repeatedly, players develop their skills and reaction abilities, and gradually improve their technical level in the game, thereby achieving better performance and becoming more confident. Creativity enhancement is also an aspect where players co-create self-development value. Fallout 76 provides players with a wealth of creative space. Players can create their own unique camps or houses in the game world and show off their design talents and creativity. Through the use of creativity, players can improve their design capabilities, imagination, and creative thinking, thereby creating a unique value experience for them. For example, Interview H expressed that his greatest sense of achievement comes from the combination of various weapons. He has been studying the distribution of player character skill points and bought seven sets of card slots himself. So he has seven ways to allocate skill points, and uses this method to match his different genres in the game, such as long-range, melee, heavy weapons or rifle genres. He studies the matching of these cards himself and uses them very well in game, which gives him a sense of accomplishment.

All aspects that allow players to tap their potential, achieve growth breakthroughs, and improve their abilities are self-development values that players can co-create, thereby gaining a sense of satisfaction and achievement from the game. Players can improve their self-confidence and self-esteem, which in turn affects their real-life attitudes and performance. The realization of this value makes games not only a platform for entertainment, but also an important driving force for personal growth and development, gaining self-confidence, self-recognition, and a sense of accomplishment.

Sociability value

Sociability plays a key role in the RPG game experience. Sociability refers to the social aspect of the in-game services and features, encompassing social interaction, collective playing involving collaboration, and interpersonal gift-giving in the gaming situation (Hussain et al.,

2023). Sociability features such as social interaction and the impact of social connections can influence a player's inclination to play video games (Hussain et al., 2023). This study found that the sociability value co-created is reflected in teamwork to complete tasks, and also in social interaction. These two aspects together constitute the social experience of players in the game, providing them with a platform to interact, cooperate, and communicate with others.

Like many other RPGs, teamwork is a vital element in Fallout 76's game design. Players need to cooperate together, formulate strategies, and solve problems together to complete various team tasks and challenges in Fallout 76. This team cooperation model not only improves the difficulty and complexity of the game, but also enhances the interaction between players. Players work together to co-create value and achieve success. Players develop deep partnerships within the game, an experience that both makes the game more challenging and promotes social interaction between players. Interviewee J's gaming experience is a good example of how team tasks in multiplayer online games can help players jointly create sociability value. According to him, when faced with challenging tasks, players can do tasks as a team much more efficiently than by one person. If players do these tasks alone, it is actually very difficult to meet the task requirements stipulated by the game. Therefore, players usually form a team spontaneously or join a daily team, and then gather at the mission location to start the mission. After completing the task, players will encourage each other and send some emoticons such as heartfelt comparisons and thumbs up to show that everyone has done a good job and has spent a good time together. In fact, the high requirements of these tasks are also a driving force for cooperation among players to a certain extent. Here is the description from interviewee K that players self-organize as different roles in the group, as a good showcase of group work in facilitating sociability value co-creation among players.

“Different players attacking the queen can quite highlight this spirit of cooperation. Everyone can find their own role in this cooperative strategy: some players are responsible for hiding and mainly causing damage to the boss; some players are wearing power armor and are responsible for providing fire support and resisting the damage of the boss; and some players will observe on the battlefield to see if any players are seriously injured and need relevant help.” (Interviewee K)

In addition to teamwork, social interaction is also an integral part of the game. The game has designed a social platform to provide places and conditions for value co-creation to help players

interact and communicate with other players. This kind of social interaction takes the form of voice calls, emoticon system settings, and even virtual social activities in Fallout 76. For example, players can ask other players to visit the houses they have built. Players can build friendships, make new friends, and form a tight social circle in the game. This social interaction experience both enriches the fun of the game, and provides players with a new social platform to enjoy social fun in the virtual world.

“I built the house on the edge of the bridge and often asked other players to visit and play. I opened up the top floor of the house into a dance floor-like facility, and then there was a viewing platform specifically looking at the bridge. I placed chairs around it. There are four radios placed in the four corners of the house. I turn on the four radios at the same time, and there will be a stereo effect. I would invite friends in the game to come to my house, have a party, dance on the dance floor, play a drag show, or take photos and records. The whole process has nothing to do with combat, but this kind of social interaction is really happy and very relaxing. In a harsh environment in Fallout 76, you must continue to interact with people and maintain a happy and relaxed mood. This is a human’s desire to survive and is also the biggest driving force for in-game characters to continue to survive.” (Interviewee E)

Therefore, players jointly create sociability value through the support of other players or through the social functions designed in the game. It is a rich and profound element in the game experience. It builds a relationship between players and others through teamwork and social interaction. In this digital era, games provide players with a virtual social platform, allowing them to interact with players around the world through games. The experience of social value not only enriches the connotation of the game, but also provides players with an opportunity to achieve social interaction and exercise social skills, providing useful support for their personal growth and social development.

Personalization value

Personalization value is also the value that many players pursue in RPG games. It provides players with a unique, private, and customized experience. This is reflected in the game’s characters, storyline, and personalized creation. Personalization is characterized as the capacity of in-game premium content to enable players to tailor their gaming encounter (Hussain et al., 2023), such as forming their team players and personal avatars, customizing weapons, and further customizing their game-related aesthetics (e.g., themes and colors; Kwak et al., 2010).

RPG games allow players to create unique characters and experience special plots. By customizing elements such as appearance, attributes, and skills of game characters, players can create a virtual identity that truly belongs to them in the game. This kind of personalized creation makes players more deeply involved in the game world and establishes an emotional connection with the game. At the same time, the open world of RPG games gives players great freedom. They can freely explore in the game according to their own interests and curiosity. This freedom is not limited to geographical space, but also includes choices in-game missions and storylines, allowing players to shape their own unique characters and gameplay experiences.

In addition, Fallout 76 provides a private base or house construction mechanism, allowing players to have an independent space in the game. By building and decorating, players are able to customize their own private house that reflects their aesthetic and personality. These private areas become places for players to relax, meditate and express their individuality. Interviewee C mentioned that he has a very high personalized demand for his architecture. “I’m a house builder. I’m definitely not as good at building as those veteran builders, but I care about what my house looks like. So I pay attention to collecting furniture, and I also care about collecting some player character costumes. For example, my headdress now, and the clothes I wear most often are actually Atomic Coin items.”

From this, we can find that many players need to express their unique tastes and aesthetics through personalized characters or personalized creation settings, so as to gain a sense of self-identity. This personalization value co-creation also allows players to experience the pleasure of creation and be able to use their own creativity.

Superfunctionality value

Super functionality value is a unique experience that provides players with a unique set of benefits and advantages. Hussain et al. (2023) thought video game-related superior functionality represents the degree to which the in-game premium content provides players with relatively advanced functions and additional services over the existing formats of games (Hussain et al., 2023), and these advanced functions of premium content are mainly embodied as boosting performance, unlocking game content, greater accessibility, character personalization in most video games (Guo and Barnes, 2011; Macey et al., 2020).

The study found that the co-creation of super functionality value can be achieved through membership systems. In Fallout 76, players can pay to become members to enjoy unique privileges, including more game resources, regular exclusive activities, opportunities to accelerate upgrades, etc. Membership privileges facilitate players' in-game progress and give players a unique status in the game, forming a distinct difference from ordinary players. Privileged players often receive unique in-game equipment, appearances, or exclusive skins. These privileges allow players to have a unique and optimized gaming experience in the game and be more visible and superior among others.

“VIP members have some privileges. The privilege allows me to try things that non-members cannot. For example, the simplest thing is that I can store unlimited garbage in the tents of the camp, but there is a limit to the amount of garbage that non-members can store in the tents of the camp.” (Interviewee C)

“The series of special functions brought by the membership is very important to me, I would not play the game without membership.” (interview J)

The value demand for privileges stems from players' desire to satisfy their pursuit of uniqueness through unique rights and resources. It also allows players to feel a sense of superiority in the game, with a unique appearance, powerful equipment, or a unique status, which demonstrates a higher social status within the game.

Community building value

This thesis found that players will build their own communities by working together with other players to complete tasks and challenges through teamwork, and also by enhancing community cohesion through mutual help and sharing of experience and skills among players. This community-building value strengthens connections, interactions, and cohesiveness among players.

In teamwork game tasks, different players support each other and complete challenges together. Unlike other games, the relationship between players in Fallout 76 is relatively harmonious, and many veteran players will provide help and warmth to new players. This kind of help forms a kind of inheritance and makes the atmosphere among players in the overall game warmer. In the gaming community of Fallout 76, experienced players often share their gaming experiences

and skills to help novices solve their problems. Besides, mutual aid through communication and answering questions not only promotes friendly relations among community members, but also improves the gaming level of the entire community.

“In Fallout 76, experienced players will take the initiative to help new players and help them get through the novice stage well. When new players don’t understand anything, they teach them how to read these instructions, give them some items, form some private teams, or directly help new players build some facilities.” (Interviewee D)

Furthermore, this kind of community building often forms a unique fan culture. Because players like a certain game, they are keen to play all related series of games, which enhances their loyalty to the series of games and also has common interests and values with other fans and players. This fan culture allows players to find resonance in the community, and establish deep emotional links, and a sense of identity in the gaming community, strengthening their sense of presence and status in the game.

Creative collaboration value

In addition to community building among players, this study also found interactions and collaborations between players and game developers to enhance the gaming experience through co-creation. This kind of creative cooperation not only allows players to become a part of game creation, allowing them to participate more deeply in game creation and design optimization, but also makes the game itself innovative. According to the thesis, the value of creative collaboration refers to the value in games where players participate in game creation and enhance the game experience through co-creation, sharing of ideas and interaction with game developers.

Fallout 76 allows players to provide their own ideas and suggestions, and the developers will seriously consider them and implement them in the game. This direct feedback mechanism allows players to feel that their ideas have a substantial impact on the game, inspiring them to be more creative. Many players in the gaming community evaluate and provide opinions on the game, and gamers will also conceive of certain game designs. This kind of creativity is sometimes adopted by game developers and incorporated into new versions of game designs to upgrade the game. This creative cooperation between players and game developers allows the game content to be continuously improved to better satisfy the players’ gaming experience,

and also makes Players who participate in the creative improvement of the game gain a sense of accomplishment and pride in their creation, stimulating their motivation to continue creating.

“Player groups also bring value to game companies. For example, Fallout 76 officially sells some exquisite buildings and furniture in the game store. A large part of the creativity of these buildings and furniture comes from players.” (Interviewee I)

This is a vivid example of how players are engaged in game content design. Creative collaboration value strengthens players’ sense of participation in game creation. They are not only game consumers, but also game creators. This deep sense of participation makes players more involved in the game and gives them a sense of creative achievement and satisfaction. By responding to players’ creativity, developers form a close interaction between the game and players, improving the playability and innovation of the game. Overall, the value of creative collaboration makes games no longer a one-way entertainment experience created by game developers for players, but a process of co-creation by players and developers, bringing shared pleasure and cooperation to players and game developers.

5.1.2 Dynamic Change of Value Co-creation in RPG Games

In the analysis section, in addition to analyzing different types of value that players can acquire in the case of Fallout 76, this chapter will argue another finding, that is, the values players created and acquired in value co-creation have the phenomenon of dynamic change. The specific manifestations of dynamic change consist of the dynamic change of players’ focus from intrinsic to extrinsic values, the dynamic change of exact gameplay mode among players, and the dynamic change at the different periods of the same player separately. The study also discovered that the emergence of burnout (the result because players’ length of game time reaches a certain level), the diverse value needs of the same player, and the players’ sense of value in RPG construct the factors of the dynamic change phenomena.

Change According to Game Experience and Progression

Dynamic change refers to the process of continuous, often unpredictable, and multifaceted alterations within a system or environment (Luenberger, 1979). With the embodiment of the Fallout 76 virtual world as the specific environment of dynamic change, the dissertation argues that as the continuous increment of Fallout 76 players’ time input and their in-game characters’ level happens, the value created by different players will have the relative dynamic alterations,

which is specifically embodied as the changement of exact gameplay mode players adopt for acquiring different genres of value (e.g. emotional value, social interaction, etc.) in Fallout environment.

In semi-structured interviews, respondents offered descriptions of the variations from their group play before and after their characters' level change. Interviewee C, a young (20-25 age group) male master student with almost twenty years of video game experience, clearly expressed his desire for a team-based mode after his in-game character had reached several hundred levels. He felt that during his novice exploration period, the huge amount of challenges present in the game made him eager to experience the delight of solving them alone, "which brings me more fulfillment and enjoyment as opposed to working in a group." His opinion actually changed significantly when his character strength remarkably increased.

"The level of my current character has exceeded 700, and there is nothing within the Fallout 76 world that can kill me and threaten me, hence I find it boring to do these assignments alone; but when I have friends to play with, it can be very interesting and enjoyable." (interviewee O)

However, with the existence of unpredictability and multifaceted characters in dynamic change, not all players prefer to self-organize as a team as their characters level up. Interviewee D, a veteran player who has spent more than three thousand hours in Fallout 76, feels more comfortable exploring the game world alone with his Fallout 76 playtime and character level increasing, "I can slowly enjoy the different scenes in Fallout 76 world when I'm doing the in-game assignments by myself, especially for the little details and designs that are randomly hidden in the corners of the Fallout 76 world." It can be seen that the variation of different interviewees' gameplay modes is inconsistent and relatively difficult to predict with the increment of time and level in a system like the Fallout 76 world.

This study firstly considers that the dynamic change of exact gameplay mode among players belongs to the holistic phenomenon, rather than the phenomenon for individuals or part of the Fallout 76 players. Burnout becomes the fundamental reason for the dynamic change, it happens as players' character strength and playing time continually increase, and players keep insisting on the same gameplay mode and environment will eventually lead to the emergence of burnout phenomenon (Zhang et al. 2019). Players' burnout makes it increasingly difficult or even impossible for players to acquire positive value under the same circumstances and the adoption of the same gameplay mode (Zhang et al. 2019). Therefore, it is common for players

to change the exact gameplay mode and the relative methods to improve their game experience and deal with the burnout phenomenon. This is the holistic embodiment of dynamic changes in the players' exact gameplay mode. Secondly, the thesis considers that the specific manifestations of dynamic change on different players are distinctive. Due to the variability of different players, there are also individualized differences in proficiency, character level, and when burnout occurs across different players, which makes it difficult to predict the alterations of exact gameplay mode on certain players. As a result, the dynamic change of exact gameplay mode among RPG players demonstrates the peculiarity of holistic and discrepancy.

Change According to Different Needs and Circumstances

In addition, this dissertation finds that not only does this dynamic change among players occur when the players' length of game time reaches a certain level and when burnout emerges, but also that the diverse value needs of the same player in RPG are an important factor resulting in the dynamic change. Not all values are co-created all together at the same time by a player. During the same game level, players may emphasize on different values on different days according to their demand and game conditions. In other words, the specific ways in which the player's character plays the RPG and the associated values he or she emphasizes in the game can have dynamic change in unpredictable ways as the player's potential requirements change. Interviewee E, a self-described "Appalachian traveler" also referred to his diverse and volatile needs in Fallout 76. "As a traveler (laughter), I often explore the Fallout 76 world by myself, and I always record the beautiful in-game sceneries with my camera if I find some places that deserve me to memorize." But the aesthetic experience of adventure by himself in Fallout 76 environment is not the mere need of this "traveler".

"I usually invite my friends (whom I met in Fallout 76) to my house and hold the party together, and then my friends and I just dance in the big villa I built by myself; while completing tasks in the Fallout 76 world through the relevant quest instructions also provide me with the insight into the interesting storyline. I don't strictly schedule the exact timing of doing these actions, because I just do it when I have the relevant need for value. These different types of operations can provide me with different values and all of them are important parts of my whole gaming experience." (interviewee E)

In contrast to the phenomenon of dynamic changes among players, the fundamental reason for the dynamic changes of the same player over different moments (in this context, different

moments refer to the same player's playing time and their character's strength and level hasn't changed significantly) is the diversified needs of player for playing RPG. In the chapter on *variety of value*, the thesis analyzes a series of values that players can obtain from RPGs, and the players' needs to obtain and create different values (e.g., self-development value, sociability value, personalization value, etc.) also constitute a major factor in the players' relative needs to play Fallout 76. Through data collection and analysis, this study found that although players have a clear understanding of their different genres of needs, they do not make systematic and regular schedules for different operations based on their needs; on the contrary, they usually take action directly after they have the need. This makes the player's actions under different demands highly random and volatile, because players cannot easily predict the time of the emergence of needs, and it also becomes almost impossible to accurately predict the type of actions that the same player will take at certain times. which finally results in the dynamic change that happens to the same player.

Change from Intrinsic to Extrinsic Values

This thesis argues that another aspect of the dynamic change in players' value co-creation is the alterations in players' focus from intrinsic values to extrinsic values. In RPG environment, as the players' playing time and characters' level grow, the focus of players has also changed from themselves to the entire game community or other players in the game world, and these players are willing to actively contribute to the maintenance of a stable and harmonious social atmosphere in the game community when they initiate to care others rather than merely themselves. For example, Interviewee J's concern for other players is mainly reflected in the game world.

“As an experienced Fallout 76 explorer (laughter), sometimes when I see new players walking out of 76 shelters lacking powerful equipment, I'll try to catch their attention and then give them some useful medicines, food, etc. to get them through the newbie phase as quickly as possible; I'll also participate in some tasks full of challenges with new players and always be ready to offer them potential assistance.” (Interviewee J)

Interviewee J represented the players who showed their concerns for other players and even the whole game community by actively aiding novice players in Fallout 76 world. However, not all the Fallout 76 players prefer to direct help in the game. Interviewee E and Interviewee L dislike approaching too much with new players in the Fallout 76 world or helping them

directly, yet they still insist on utilizing their methods to show their care about the community, such as uploading posts to share their experience of improving their characters' level quickly and accomplishing the in-game assignments efficiently, and actively responding to new players' questions in Fallout 76 community. Interviewee M also believes that this dynamic change on players' focus from themselves to the whole community has even evolved into a specific cultural ethos that is inherited and developed within the Fallout 76 community.

“When I first came out of 76 shelter as a novice, I had very few equipment items on my character's backpack, but now my character's level has reached a few hundred levels. It was those experienced senior players who helped me a lot in Fallout 76 world and made me get through the toughest time in the game; hence whenever I meet the novice players in Fallout 76 world with my current character's strength and level, I will also do my best to help them. I'm trying to inherit and spread the friendly spirit of helping each other. And I'm not alone, there are more and more players in the Fallout 76 community who, like me, are willing to be the inheritors of this friendly spirit.” (Interviewee M)

As with the dynamic change of the players' exact gameplay mode, the dynamic change of players' focus from intrinsic to extrinsic values is an overall phenomenon for the Fallout 76 players. The players' sense of value is the crucial cause of this dynamic change phenomenon, which encapsulates an individual's perception of their value, encompassing feelings of self-respect, self-acceptance, and confidence in their abilities and inherent worth as an individual (Crocker & Wolfe, 2001; Rosenberg, 1965). It is the players' sense of value that accelerates them to switch the focus and make a contribution to other players and the whole community, because they both belong to veteran players who can help novice players, and regard positively aiding others as achieving their value. Many experienced players have experienced these aids from veteran players during their newbie period, which reinforced their considerations of contributing to the community and other players as self-fulfilling value.

Predicting the dynamic change in players' focus from intrinsic to extrinsic values is difficult, constrained by the factors that different players spend distinctive lengths of time being veterans and contribute in different ways. Yet these players' attitudes toward caring about others and the gaming communities are undeniably positive. This dynamic change also has the potential of being a positive cultural ethos and even bringing aid and influence to more and more novice players in other RPGs.

5.2 Factors Influencing Value Co-creation Experience

In this chapter exploring how affordance influences players' value co-creation experience, two aspects have been concluded as factors, including the player's perception ability, and different types of displayed affordances interacted by players. The first factor is the player's ability to perceive affordance. It is from the player's side to explore the possible influence on their experience. The player's ability to perceive depends on three main factors, including previous game experience, common sense, and cultural and social context, and is categorized as capable perception, incapable perception, and over-perception. According to analysis, capable perception has a positive on value co-creation experience, while incapable and over-perception have a negative on it.

Furthermore, the design of affordance also shows impacts on player's value co-creation experience. It is found that perceptible affordances, good design of affordances, are mainly positive, while false and hidden affordances are poor design of affordances, which are negative after the investigation in the framework of Gaver's technology affordance (1991). Apart from that, ambiguous affordances and superior affordances, new to Gaver's existing model, have been proposed as good design of affordance in the thesis and are found to have a positive influence on player's value co-creation experience.

5.2.1 Player's Perception Ability

Players' perception capacity can bring impact on players' value co-creation experience, as it determines whether players can correctly and appropriately cognize affordance that affects their experience. Players' interaction with affordance is also concerned with how affordance is perceived (Kaptelinin & Nardi, 2012). When players have a good cognition on affordance they interact, they could get positive value co-creation experience in gameplay.

5.2.1.1 Facts Influencing Player's Perception Ability

Our analysis of how players perceive affordance in Fallout 76 mainly reveals three approaches: previous game experience, common sense, and cultural and social context (Gaver, 1991). Previous game experience is the most common factor in perceiving affordances in our survey samples, while the commonsense and players' cultural and social backgrounds are also important elements for many players to perceive affordance in the game environment. Players who played Fallout four or older series before should have exposure to the same features and functions in Fallout 76. So they would subconsciously understand what affordances are there in the interaction of the in-game environment based on their experience of approaching similar features and functions from Fallout older series or similar RPG. Experienced gamers, after playing various games for many years, subtly know the settings of games, grasp how to interact and understand the tasks and actions of the game owing to analogy. Equipped with common sense and cultural and social background, players can also easily understand the clues and settings and go smoothly in completing tasks and achieving goals.

“Because I am an experienced player, these things are basically instinctive operations for me. I don't even need to look at them when playing Fallout 76. I know how to put my workbench out of the way, and how to use the things in your game.” (Interviewee L)

Common sense was also brought up as a factor in helping gamers understand affordance. Because the setting of the game was the world after nuclear radiation, the background and interaction of this world would be understood through common sense. For example, if players saw luminous objects on the ground, or piles of nuclear waste, they would subconsciously know that if they went to these places, their radiation figure would definitely increase. Sneaking in the game, players knew that they should not turn on the lights or make louder noises, because the probability of being discovered in a well-lit place and with a big sound was definitely higher than in a dark place and in quiet. Otherwise, they would be discovered faster. Based on their own knowledge, they knew where to get the necessary materials. For instance, they needed wood in the forest or branches to build a house and needed iron from different metal stuff like metal bowls to make weapons or furniture. All these were affordances that could be judged based on common sense.

Perception of affordances was also restricted by cultural social settings (Gaver, 1991). A person's culture, background, and social environment can have a profound impact on their

perception of affordance. The cultural and social background in which individuals live may shape their understanding of the functions and uses of things, and they have unique cognitive patterns for the interpretation and use of objects, symbols, and environments. The ability to perceive affordance will be more diverse and may be more influenced by traditions, values, and social habits. These factors jointly affect individuals' perceptions of the environment and the operability of items, shaping their perception and understanding of affordance.

5.2.1.2 Three Types of Perception

Capable perception

Whether players are capable of appropriately perceiving the in-game affordance with these approaches will directly affect their value co-creation experience, and suitable perception can mostly create a positive impact on players' value co-creation. Highly similar game experience, good common sense as well as a similar cultural background, can facilitate players to perceive the affordance more quickly and efficiently. It is beneficial for players to improve the efficiency of completing tasks, receiving more personal achievement and a delightful sense, which can be manifested as completion, personalization and self-indulgence value co-creation experience. Experienced users are often quick learners and can be adaptive to the new interface because they can leverage previous experience with similar systems. Knowledge can be transferred from one to another, facilitating the exploration and understanding of new capabilities in the game world. Therefore, experienced players are able to identify affordances with in-game options and strategies more quickly and accurately because they are already familiar with the possibilities. This enables them to make decisions and act more efficiently, leading to fast and excellent completion of task and facilitating a sense of competitiveness and heartfelt pleasure in players.

The commonsense knowledge that is equipped by the populace can make the vast majority of players perceive the in-game affordance quickly and almost instinctively as well. For instance, players know that they should turn off the lights or not make noise when they are in the sneaking status, because the probability of being discovered in a well-lit place and with a big sound is definitely higher than in a dark place and in a quiet status. Same with game experience, it empowers players to act properly and competitively and achieve goals smoothly. In addition, the Fallout 76 cultural circumstance is based on American culture and society, and some forms of affordance are embodied as American culture, customs, etc., So the American players, or

those players who are familiar with American culture and society, tend to perceive these set of affordances in-game more quickly and explore the game world more easily and comfortably. Their perception of the culture can give them hints of possible task setting and challenge requirements.

Incapable perception

On the contrary, if the player lacks the ability to perceive these operational possibilities, he or she may not be able to detect the hidden affordances in the game. This situation may cause them to miss out on important information or opportunities in the game, affecting their understanding and engagement with the game world. Therefore, the player's inability to perceive the operational possibilities and clues in the game has a negative impact on the game experience and can determine the depth of interaction and the degree of enjoyment in the game.

For example, the cultural background and social structure of Fallout 76 were very grand and comprehensive with a complete worldview. The time was set in the middle of the 21st century, after the outbreak of the nuclear war in the US. It was in the context of American culture and social settings and how it was in a living state of the wasteland world. A simple example of cultural restriction would be the language that cannot be perceived by players without a good English level. Other examples might be the songs from the 1980s or 1990s in the US or understanding the story and clues in the notes of NPC, and the perception of these affordances would be missed if players could not recognize the cultural meanings in the special context. The cultural restriction can also be reflected in the translation that players sometimes cannot totally understand the meaning of the words in other languages' versions because of the translating issues.

This translation is human-translated by non-game players because the text has been hard-translated. There was a tape that said point C or point B and brackets after the translation was put there to say that he was not sure. It can be seen that the translator is not a Fallout player or military enthusiast, because team A is the alpha team. Point B is the bravo team, team C is the Charlie team, and team D is the delta team, which is often used by the British and American Marines. (From Baidu Tieba)

Different cultures and social contexts can influence how users perceive affordances. Certain design elements that are widely understood in one culture may not be as intuitive in another.

Hence designers must consider these cultural differences in order to create inclusive interfaces that are accessible and meaningful to users from different backgrounds. Language plays an important role in user interaction. Not only the choice of words and labels used in an interface can affect how users perceive available actions, but the language barriers can affect users' understanding of specific affordances and hinder effective interaction.

Over-perception

Experienced users are mostly quick learners and can be adaptive to the new interface because they can leverage previous experience with similar systems. These experienced players are able to identify affordances with in-game options and strategies more quickly and accurately because they are already familiar with the possibilities. Nevertheless, skilled veteran players may sometimes also misjudge due to overconfidence or overreliance on past experience, resulting in false affordance and invalid action, which causes a negative gaming experience, since different games may have different rules and mechanics. Even if players are highly skilled at a certain game, over-reliance on past experience and over-perception of affordances can lead to misinterpretation of affordances when they try new games. Players may project past experiences into new situations, leading to misjudgments. Some experienced players may also blindly apply strategies that they have succeeded in other games, but these strategies may not be applicable to the current game. Different games require different strategies, techniques, and ways of thinking, so experienced players also need to learn from scratch in a new game to suit their unique affordances. Awareness of the differences is crucial, reminding players to keep an open mind, actively explore new game mechanics and realize the potential false affordances in gameplay.

In conclusion, the finding of players' perception ability is consistent with value co-creation theory where players play an active role in creating value by integrating resources (Skålén, 2018; Vargo & Lusch, 2016). They not only use existing resources, namely affordances, provided by gaming companies, but also their own array of resources, including their knowledge, skills, experience, and background, to create their own value in gameplay. These personal resources significantly contribute to their gameplay experiences and the value they derive from the game. It is also a showcase to support value co-creation theory and refute that value is solely created by a company and passively. In short, players' capability of perceiving affordance using three approaches allows them to have positive value co-creation experience in the game world.

5.2.2 Design of Affordance

In addition to players' personal factors mentioned in the previous section, objective affordance design also has an impact on players' value co-creation. On the basis of Gaver's (1991) affordance model, this study found that players' value co-creation is positively influenced by good affordance design and negatively affected by poor affordance design. Poor affordance design includes false affordance and hidden affordance, which have a negative impact on players' game experience. Good affordance design includes perceptible affordance, as well as the ambiguous affordance and superior affordance found by authors, which plays a positive role in players' value co-creation experience.

5.2.2.1 Poor Design of Affordance

False affordance

This thesis found the negative impact of false affordance on players' value co-creation experience. False affordance happens when an object hints at a specific functionality or interaction, but the use or functionality does not work or does not exist, it provides a problematic signal to players and makes players act accordingly but without any response (Gaver, 1991), False affordance will mislead players in the game, which makes them feel that a certain action or operation is valid and take corresponding actions, but it will not produce the expected results. This situation can lead to players wasting time and energy as they invest effort in the wrong direction, trying to interact that doesn't work as expected, and end up feeling frustrated and confused. This false affordance affects players' understanding and engagement with the game world, thereby reducing their involvement and motivation. Therefore, false affordance, as a poor design, will hinder players' value co-creation and even lead to a negative impact on their game experience.

The wrong task instructions appearing in the game system is a manifestation of false affordance, usually increasing the time for players to accomplish the tasks, thus increasing the degree of challenges and difficulties of players to complete the concrete assignments. Different from the challenges that Fallout 76 itself designed for players to increase the enjoyment of the game, the extra difficulty caused by the wrong task instructions is almost impossible for players to solve, which will directly lead to the inability of players to complete the specific tasks. The

exemplification of false affordance can be seen from Interview C in how players build the houses.

“When I lacked wood during the process of building my house, my first instinct was to go and cut down a tree, but the trees in the game can’t be cut down, so you have the embarrassment of being in the forest and not being able to get any wood.”

Hidden affordance

It has been found that hidden affordances negatively influence the players’ value co-creation experience. Players could not recognize affordance if there was no information available on the relevant affordance, which would result in hidden affordance. If it is not inferred from other information, the hidden affordance would lead to a mistake or misunderstanding (Gaver, 1991). Although the hidden affordance exists in the game, it is not clear for players to discover, which cause players to miss the opportunity to compete in the game and reduce the possibility of value co-creation. Therefore, hidden affordances in design may diminish players’ game experience and value co-creation process.

The non-negligible manifestation of hidden affordances’ negative impact in Fallout 76 is that players miss the relevant information and thus suffer the negative emotions due to the existence of these hidden affordances. There are often situations where English is not translated, causing non-native language players to often miss important information. For example, the majority of signs in an assignment site named Enclave Bunker are basically in English, and Chinese players have complained that they frequently get lost in this facility because they cannot understand English signs, which delays their tasks’ proceeding and affects their personal achievement. As a result, players cannot act properly and feel unhappy and confused because of these hidden affordances that are difficult to explore and find in their value co-creation process.

5.2.2.2 Good Design of Affordance

Perceptible affordance

Players express their positive attitude towards perceptible affordance and their positive value co-creation experience brought by perceptible affordance which represents a good affordance design. They consider perceptible affordance as the important medium for them to interact with the world and experience the atmosphere when they play Fallout 76. They think highly of the

easy access to user interfaces to illustrate the function of these perceptible affordance elements and their positive experience of it.

Perceptible affordance provides clear and obvious clues or instructions so that players can accurately understand the operations or behaviors that can be performed (Gaver, 1991), helping players quickly understand the operable objects and environments in the game. When players can intuitively perceive the interaction of an object or scene, they can make decisions faster and act accordingly. The process from accepting the concrete tasks to completing the tasks is inseparable from perceiving relevant perceptible affordances, successfully understanding and finally completing the task. Hence, these perceptible affordances embodied in various clues play a crucial role in connecting all procedures of the task, guiding the player to complete the task, and improving the strength of their roles. Another example is mainly reflected in the marking of the enemies through the distinctive icon. Fallout 76 will mark special enemies with stars or skulls, and the player has the possibility of acquiring powerful weapons or items that increase the strength of their character if they defeat these special enemies with icons. Therefore, the perceptible affordance shown as icons of the specific enemies can potentially stimulate the enthusiasm of players to search for and defeat relevant enemies, and ultimately improve the strength of their characters.

Perceptible affordances can also increase players' emotional engagement and immersion. When players can intuitively perceive the interactive clues in the game, they will be more likely to be immersed in the game world and resonate emotionally with the game characters. Perceptible affordance allows players to feel the authenticity and coherence of the game world, making it easier to have a sense of substitution and emotional resonance. This kind of emotional investment and immersion will make players enjoy the game process more and be more willing to invest time and energy to explore various possibilities and challenges in the game world. The player's positive emotion is specifically manifested in the acquisition of delight, relaxation, etc., which can be achieved by their awareness of perceptible affordance. As an example, perceptible affordances enable players to gain positive feelings in accomplishing specific tasks or going through the vivid and interactive game world. Fallout 76, as a role-playing game, requires players to take on the role of a character and learn about a range of survival and stories through perceptible affordance in the open world in order to survive successfully. With the help of perceptible affordance, players can easily be immersed in the game world and feel involved in all activities, which facilitates a sense of accomplishment, happiness, and delight. The

smoothness of their Fallout 76 gameplay gives them an enjoyable feeling, which acts as the radical incentive for them to continually play Fallout 76.

Ambiguous affordance

In general HCI design, scholars discovered apparent affordances were usually considered to provide strong and clear clues to support the operations of HCI goals and perform an action accordingly, while the incorrect and not apparent affordances would relatively affect the process of HCI because they could manifest the momentous information and clues (Kaptelinin & Nardi, 2012). Gaver (1991) explained in his classification that clear perceptible affordance promotes people to achieve their relative goals more easily because its perceptible character establishes the stable link between perception and action (Gaver, 1991, p.79), as analysed in above section. However, a different voice is also articulated by some players in terms of apparent and straightforward perceptible affordance. Although some players are delighted to directly perceive apparent affordances and enjoy the direct joys by easily following the series of task instructions, some would have different demands and interests in preferring to have complicated and amphibious affordance in the game environment with unclear clues for action, which has not been mentioned by former studies.

This thesis found that ambiguous affordance is also a favorable design by some players to gain positive value co-creation experience. Ambiguous affordance was concluded by authors as a new concept to Gaver's technology affordance in terms of the video game industry as it witnesses a discrepancy from other industries demanding apparent perceptible affordance as a good HCI design. Ambiguous affordance preferred by players is different from perceptible affordance which is designed to offer clear and easy clues for players to act accordingly (Kaptelinin & Nardi, 2012; Gaver, 1991). It can not be directly perceived by players, but like a puzzle that needs players to collect pieces using further knowledge, skills, analysis and actions to get a whole picture of the information. They prefer to have complicated and amphibious affordance with no clear clue for action and are glad to peel back the onions and find the way through fog. It's not apparent perceptible affordance and also not hidden affordance that cannot be recognized by players. Therefore, ambiguous affordance is proposed to make up for the missing interpretation of the phenomenon. It is a strong motivation for players to improve their strength and pleasure, and most importantly the challenge experience.

For instance, the affordance, task instruction has been mentioned by some players to be too easy to follow which decreases their feeling of pleasure. Players need to move forward and take action according to task instructions in the game, and significant straightforward perceptible affordance can be fully understood by players without taking a long time. While indirect task requires players to infer the relative clues and have further consideration to understand. So these players who enjoy inferring and thinking in the task accomplishment process dislike straightforward affordance and prefer ambiguous task instructions because too clear instructions make the game not challenging and decrease their self-indulgence experience.

“You can only follow the task prompts directly, which are clearly set as a point for you to reach. You walk to that point, interact once, and then retrieve an item, or you go there to kill someone and then return. The tasks have almost no level of difficulty or complexity to speak of.”
(Interviewee I)

With ambiguous task instruction, there could be a good process of understanding the open world. Players pursue to be competitive and high advancement of their in-game experience in the context (Hussain et al., 2023), and low difficulty of the game is beneficial to new players who can grasp the gameplay fast and be competitive in the game world. Nevertheless, experienced players have different pursuits and gain enjoyment by challenging themselves, not only winning others.

It is interpreted in the thesis that player's interest in ambiguous affordance in RPG games is related to the player's feeling in fulfilment of task character upgrading, and most importantly the difficulties of gameplay, namely challenges in the game. Straightforward perceptible affordance means that the player knows exactly what to do without much thought or effort, which can lead to games becoming uninteresting and less challenging. Players generally like difficult levels that require some strategy and skill to overcome. Clear and easy affordance would reduce the degree of difficulty which is not challenging for them and cannot give them a sense of achievement with easy play mode. If the game is not challenging, it will not engage players and spark curiosity and interest in players to let them keep playing.

Challenge is defined as the effort that players are supposed to exert to achieve the goal and typically requires player abilities such as accuracy, muscular control, and quick thinking (Shi & Shih, 2015). Although players might receive motivation, happiness, or even depression in experiencing the challenges, challenges are undeniably equipped with a special meaning.

According to Shi and Shih (2015), game value is an important basis for players to achieve game goals, while challenges constitute an indispensable component of the general value that players can obtain from the game. Wilson et al. (2009) also indicated that challenges exert a positive effect on the cognitive and affective outcomes of players in-game circumstances. Therefore, challenge experience is also significant to players and attribute to a part of their value co-creation experience.

These particular meanings and the importance of “challenge” actually result in these players emphasizing the acquisition of relevant difficulties in RPG. In contrast to the utilization of muscle memory and combat mechanics in battle scenes, settling the perceived but relatively ambiguous affordances in role-playing games can express different kinds of challenging experiences to players. It allows players to think through the limited information and clues that can be perceived and come up with the complete information to finish the assignments, which is an embodiment of training the players’ inferring skills. So our interpretation of many players’ preference for ambiguous affordance based on challenge is that it provides players with richer, different kind of challenge experience, and the perception of ambiguous affordance can reveal the advantage of training players to develop relevant abilities (strategic thinking) and bring the potential positive emotional value. Therefore, players’ demands for ambiguous affordance are interlinked with their challenge value co-creation experience, which is a new finding in the games industry. It can also be witnessed that as active participants in the value co-creation process, players do not want to passively get resources but give full play to their subjective initiative to create value for themselves.

Superior affordance

It is found in our analysis that superior access to affordance also generates a positive value co-creation experience among players. Interviewees have a positive impression on Fallout 76 and positively comment on the advantages of their super functionality experience in Fallout 76. Video game-related superior affordance represents the degree to which the in-game premium content provides players with relatively advanced functions and additional services over the existing formats of games (Hussain et al., 2023), and these advanced functions of premium content mainly embodied as boosting performance, unlocking game content, greater accessibility, character personalization in the most video games (Guo and Barnes, 2011; Macey et al., 2020).

In Fallout 76, the peculiarities such as the design and application of VATS mode and pip-boy system (mini menu) are referred to make a lot of convenience for gameplay. Players are able to achieve concrete gaming tasks with multiple methods rather than mere one solution. So they appreciate the variation of task achievement methods that respect their playing preference. Furthermore, VIP players' access to the game world proves the superiority and significant improvements of their experience in subscribing to Fallout 76 membership. Although players have different purposes for subscribing to VIP service, they express a positive attitude towards VIP subscription which has remarkably improved the super functionalities experience. VIP players may have access to exclusive content, features, or areas within the game that regular players do not have access to. This includes early access to special levels, unique items, updates and expansions, and provides a sense of exclusivity and additional content. Interviewee B and Interviewee J described the distinctive in-game Fallout 76 experience between normal players and VIPs, and the improvement of game experience after subscribing to membership had also been appreciated in interviews.

“It’s an online game. I think the normal players don’t have the ability, like playing a single-player game, to have such a great right to transform the world by yourself.” (Interviewee B)

“The series of special functions brought by the membership is very important to me, I would not play the game without membership.” (interviewee J)

By purchasing VIP membership or in-game value-added services, players can access to superior affordance and obtain superiority compared with normal players, such as more special skills, hidden levels, enhanced equipment, unique game modes, etc., making their characters more unique, powerful and with more enchantment. In order to obtain these features, players may be willing to make additional investments or payments. It gives players a sense of superiority in the game world and the sense of importance and exclusivity is a key aspect that contributes to player's overall experience in video games. It's very popular in service industries, where customers would like to be nicely and superiorly treated and would like to enjoy more rights and privileges. Some service industries may provide additional benefits or special treatments, such as VIP services, exclusive member rights, etc. These additional services or discounts may attract customers and meet their satisfaction. The preferential treatment and special privileges often create a feeling of significance and appreciation, influencing their attitudes to service.

It's also interesting to find out that the extra affordances needed are missing in Gaver's technology affordance theory. Some extra affordances can be perceived by players but they cannot act accordingly because the function needs special access, so players cannot perform action on the affordances, while some extra affordances exist but can not be perceived by players until they unlock the task, upgrade their character, or buy the special extra services. These extra affordances cannot be categorized as hidden affordances, since their hidden speciality is derived from not showing at certain game levels or perks rather than the design problem. Therefore, it is a new concept to Gaver's technology affordance which is more than perceptible, false, hidden, and correct injection. The extra affordance is defined by the thesis as "Superior Affordance" which refers to the features and affordances that users can only access and perceive after upgrading levels, purchasing additional services, or subscribing to specific services. It means that superior affordance is restricted for ordinary users but can be perceived and interacted with by superior users. The superior affordance is very important for user's value co-creation experience as it allows users to perceive, unlock, or obtain richer and advanced functions, and also choose advanced functions that meet their needs based on their needs and preferences. Users can get a positive experience in their value co-creation process, thereby improving service satisfaction and loyalty.

VI Discussion and Conclusion

6.1 Player's Active and Direct Role in RPG Content and Affordance Creation

In RPG field, scholars have generally affirmed the positive role of players in value co-creation (Kokko et al., 2018; Afi & Ouiddad 2021; Grohn et al., 2017; Wang et al., 2020; Abid et al., 2022). Yet the previous studies about the interventions of players on in-game content and elements (including affordance), have focused on the indirect type (Moro, Phelps & Birt, 2022; Paschali et al., 2014). For example, Moro, Phelps and Birt (2022) refer to players writing personal feedback and reviews of purchased games on Steam. Paschali et al. (2014) mentioned that players actively participated in questionnaires and surveys from manufacturers. In these indirect situations, the players' characters are not directly involved in the creation of the specific content of the RPGs. However, players have directly intervened in the in-game content through mod creation, and have even created part of the game's content in the Fallout 76 case. The online RPG manufacturers also adopted the players' designs to further enrich the game's content. The direct involvement allowed the players to interact more frequently with the Fallout 76 manufacturer, and injecting a positive impact on the overall process of value co-creation.

In Fallout 76 case, it is the existence of player-creative communities and social platforms that became an important prerequisite and guarantee for players to intervene in the in-game content. These communities provide the platform for players to demonstrate their ideas and mods, while other players in the community form the first review of players' ideas and mods. That is, a sufficient base of community players first judge whether players' ideas and mods are good or not, and whether there is relative stuff that may mislead or influence the player (hidden affordance and false affordance). The Fallout 76 manufacturer in the communities conducts a second review of players' creations that have been qualified from the first review, and gets the legitimacy to use excellent content directly from players in reasonable ways. Therefore, the large player base and the presence of Fallout 76 manufacturers in communities provide the possibility for players to directly create high-quality mods and ideas, and establish systematic content review mechanisms. Since the release of Fallout 76 in November 2018, the online RPG has undergone 18 major content updates, and all players who purchase Fallout 76 can play the updated content for free (Fallout 76, 2024). Mods and related ideas created and designed directly by players occupy an important part of all Fallout 76 updates, along with content designed by the manufacturer to enrich the player experience.

There are undeniable advantages to having players indirectly intervene in the game content. Hence plenty of online RPG manufacturers encourage players to communicate with themselves through a series of indirect methods including surveys, questionnaires, Beta tests, etc. Nevertheless, the Fallout 76 case exemplifies the unique appeal of direct intervention over indirect approaches. Game content with appropriate affordance that is designed from the perspective of players can effectively compensate for the limitations caused by the perspective of manufacturers, such as the difficulty of totally understanding the feelings and needs of players, and the existence of hidden affordance and false affordance designed by manufacturers. The systematic review mechanisms established by the manufacturers and other players of the community are also beneficial to the selection of high-quality player-generated content.

The Fallout 76 case illustrates the importance of recognizing that the player is available to directly intervene in RPG content and related affordance. In the context of value co-creation, manufacturers and players should work together to foster game-related communities. Then, the combination of players' indirect and direct intervention in the concrete content can better improve the relative content in-game affordance, provide players with a better game experience, and ultimately bring positive influences on the whole value co-creation process. Players' direct intervention in Fallout 76 establishes an example for other RPG players and manufacturers to achieve the goal of value co-creation.

6.2 Links Between Player's Perception Ability and Design of Affordance

In analysis, two factors relevant to affordance have been found to have an influence on players' value co-creation experience. They are interlinked to each other to have an impact on player's value co-creation. Player's perception ability is the prerequisite for players to play games and they are armed with the capacity to perceive possible affordance for further action. The design of affordance within a game significantly affects the validity and effectiveness of these affordances, subsequently influencing a player's perception and subsequent actions within the gaming environment. Affordance determines the level players can interact with the gaming world, while players' perception determines how they will rely on the affordance to make a decision. Therefore, two factors are intertwined with each and influence on player's overall value co-creation experience as a whole.

Players' perception abilities, capable, incapable, and over perception directly impact how they navigate challenges within the game and determine action choices and utilization of their

problem-solving, decision-making, and strategic thinking skills in game-play. Their perception isn't just passive reception but an active process of interacting with the gaming context. The player's perception ability is integral here, as they interact with the game world by interpreting meanings brought by various elements of the game world. The assertion that a player's perception ability remains actively engaged aligns with the principles of value co-creation theory, which positions the player as the primary architect of value within the gaming experience. In this context, the player assumes an instrumental role in not only consuming the game content but also actively contributing to and shaping their value and experience.

The design and display of different affordances to players will greatly show how much clues and information can be shown to players for further action. Affordances failing to present proper clues and instruction for further action, like false and hidden affordances, can not be correctly perceived by players and cause confusion in players to trust their cognition and ability of strategic thinking and decision-making. Good affordances, like perceptible, ambiguous, and superior affordance, manage to convey suitable hints to players and guide players in interacting with the game to take actions, finish tasks, go through plots to the next level.

The player's experience isn't solely embedded and shaped by the game design itself but emerges through the collaborative factors of the player. Affordance presence will determine how valuable and effective they would be and how players will perceive them in guiding the player's in-game actions. Player's perception ability directly influences how they interpret and respond to the affordances presented within the game and also determines their participation and engagement with the game content. A well-designed affordance leverages players' abilities by offering clear and intuitive cues that match the player's perception, enhancing immersion and facilitating engagement. If affordances are poorly designed or do not align with a player's perceptual abilities, it can lead to confusion, frustration, and a disjointed gaming experience. Therefore, two factors are interlinked to have an overall influence on player's value co-creation experience.

6.3 More Importance and Essentials for Value Co-creation Brought by Online Circumstance

In previous research on the domain of value co-creation in video games, scholars have primarily focused on analyzing the value co-creation experience of players, and employed theoretical models to evaluate and think about how to promote players to get better value co-

creation experience (Hussain et al., 2023; Verleye, 2015; Grohn et al., 2017; Afi & Ouiddad, 2021; Gidhagen et al., 2011). However, the scholars mainly regarded video games as a monolithic entity, overlooking the crucial distinction between online games and single-player games. Through the data collection and systematic analysis, this thesis considers that as to the thesis's research question, whether the RPGs have the character of online circumstances will also have an impact on the whole value co-creation process. That is, the online and massively multiplayer peculiarities of MMORPGs bring a positive impact and more necessity for the value co-creation between players and game manufacturers.

Actually, most game companies tend to cultivate the single-player RPG series with a quick updating tempo of the new productions. Take Ubisoft's famous single-player RPG series "Far Cry" and "Assassin's Creed", and SQUARE ENIX's "Final Fantasy" and "Dragon Quest" series as examples (Ubisoft, 2024; SQUARE ENIX, 2024). These game companies that create and successfully operate these classics (e.g. Ubisoft and Square Enix) keep publishing new RPGs every several years or even less so as to continuously develop and expand these RPG series. Because of manufacturers' emphasis on creating new single-player RPGs, unless some fatal problems exist in the game, these game manufacturers do not spend huge amounts of time frequently updating or modifying the relative content of these published single-player RPGs. The game manufacturers set the specific channels for collecting the players' feedback on these single-player RPGs, and some of this feedback might be used or the potential RPG in the future, but not directly modified on these published single-player RPGs. It can be seen that players and game designers are relatively separated in the single-player RPG circumstance: manufacturers focus on publishing high-quality RPGs at a swift tempo, while players expect the upcoming games (Daneva, 2017). As a result, players mostly care about the game content of the single-player RPGs; yet the interaction between players and the game designers is not much reflected in the process of playing single-player RPGs among players, which is crucial in whole value co-creation.

However, MMORPGs with online and massively multiplayer online peculiarities are not the same as single-player RPGs (Chen et al., 2018). Technological advancements in computer technology and the internet have enabled MMORPGs capable of accommodating large numbers of players simultaneously to flourish (Dickey, 2007). These advancements, encompassing server stability, interface design, in-game affordance, and regular content updates, make massively multiplayer online possible, and bring positive effects on the whole

value co-creation. The case of Fallout 76 illustrates the ability of RPG designers to maintain their servers regularly within the development of objective technical conditions, as well as their competence to update the in-game affordance and relative content consistently. The continuous updates and server maintenance since the release of Fallout 76 have altered the players' general evaluations of Fallout 76 from negative to mostly positive on platforms such as Steam.

The proliferation of the internet and related technologies has facilitated the emergence of MMORPGs, and created a positive impact on the whole value co-creation; the opportunities for interactions between the players and the game manufacturers have also increased within the online environments of MMORPG. A series of objectives will be achievable through closer and more effective collaboration between players and MMORPG designers, such as server stability, designing proper affordances for players, and regular updating of game content to better align with players' needs. Moreover, the frequent interactions between players and the RPG designers construct a key bridge directly connecting both sides. These types of interactions allow the RPG manufacturers better to understand the real situation of in-game affordances, while the player can better provide effective and relevant feedback to the RPG manufacturers. Therefore, when players and MMORPG designers cooperate more tightly, and actively contribute more to value co-creation under the condition of frequent interactions in online circumstances, it will better achieve a double-win outcome for both parties, and bring more positive effects to the whole value co-creation process.

The advancement of technology in online services has revolutionized the landscape of multiplayer RPG gaming, enabling players to engage in collaborative gameplay experiences without the constraints of time and location. It has been a catalyst for the servitization trend in the gaming industry, transforming traditional video games into dynamic and interactive services. By leveraging online platforms and network connectivity, game developers can create immersive multiplayer environments where players from diverse backgrounds and locations can come together to co-create value, which enrich a diverse value co-creation experience. This shift towards online services has expanded the possibilities for value co-creation, allowing players to interact, collaborate, and compete in real-time, thereby enhancing the richness and diversity of their gaming experiences. Thus, the integration of technology-driven online services not only facilitates multiplayer gaming but also fosters a collaborative ecosystem where players can collectively shape and co-create value, aligning with the trend of servitization in the gaming industry.

6.4 Implications and Limitations

Theoretical implications

The significant theoretical contributions of this study are primarily manifested in the development and integration of the theories proposed by Hussain et al. (2023) and Gaver (1991). Hussain et al.'s theoretical model (2023) primarily emphasizes the value created at the individual player level (self-indulgence, personalization, competition, super functionality, and sociability value). This dissertation proposes an extended and more systematic "value co-creation experience", including emotional value, self-development value, sociability value, personalization value, super functionality value, community building value and creative collaborative value, based on the original theoretical model. In addition to intrinsic values co-created for players themselves, it also includes extrinsic values co-created for other players (community building value) and for the game development team (creative collaboration value). Under the prerequisite of value co-creation, the player's "value co-creation experience", relative to the model by Hussain et al. (2023), can better represent the "co-creation" characteristics of players, player groups and game designers that participate in the value creation process together, and aligning more closely with the theme of value co-creation.

In the context of previous scholars' studies on the affordance field, researchers often summarize or propose relevant affordance models. The situations are varied when people perceive different types of affordances in specific environments and cues, making the type of affordance an important factor influencing people's perception (e.g., Hartson, 2003; Gaver, 1991). However, this study goes beyond classifying affordances of different types and illustrates the impact of different types of affordances on players' perceptions. Whether players can perceive and correctly comprehend affordances is also considered a crucial factor in the players' perception process, that is the subjective factors of players have been adequately considered in this study. Furthermore, by analyzing the player's subjective perspective (whether players can perceive affordance) in conjunction with the RPG world's objective perspective (good and poor in-game affordances), a more comprehensive analysis of the impact of affordance on the player's value co-creation experience is achieved. The consideration of players' subjective factors (e.g. subjective competence of perceiving affordance) and the in-depth analysis combining subjective and objective perspectives provide a good example for the scholars' future research in the affordance field.

The theoretical implications are also embodied in the discovery of the connection between affordance and value co-creation, confirming the influences of affordance on players' value co-creation experience, and explaining the specific manifestations of these influences. The frequent interactions between players and RPG designers constitute the important carriers of the impact of affordance on the player's value co-creation experience, closely connecting players and the game designers. The importance of such interactions is undeniable. As a result, the series of discoveries in this study serve as valuable reference for the scholars' future research in the RPG field and the exploration of player-developer interactions in video games and even for other service industries.

Practical implications

The study discovers a series of dynamic changes phenomena, including the alteration of exact gameplay mode among players, the shift of players' focus from intrinsic to extrinsic values, and the dynamic change within the same player across different circumstances. These phenomena have significant implications for the deeper understanding and research into players' value co-creation participation in RPGs. It indicates that the players' RPG experience, the value created during the players' gaming process, and the exact gameplay modes are not fixed, but undergo corresponding changes influenced by factors such as time and needs. Although it's almost impossible to accurately predict these dynamic changes, the study has confirmed dynamic change as an overall phenomenon among players, and the various potential manifestations of these dynamic changes. RPG developers need to recognize these dynamic changes and consider potential alterations to players' gaming experience and gameplay modes when designing new RPGs or updating existing RPG content.

In the discussion section, the discovery of players actively participating and even directly designing game content challenges the traditional view of considering players as passive recipients in the relationship with the game designers. In this traditional perspective, even though players are encouraged to provide feedback to the designers, they are primarily considered as passive recipients of games and related questionnaires, surveys conducted by the designers. Nevertheless, the finding in Section 6.1 not only proves the active and direct role of players direct role in RPG content and affordance creation, but also highlights the unique advantages of players directly designing the concrete content. For RPG manufacturers, as the popularity of massively multiplayer online RPGs continues to rise, the online circumstance brings more importance and essentials to value co-creation. How to stimulate the enthusiasm

of players to participate in RPG content creation, selecting high-quality player-design content, and seamlessly integrating player-designed content into the game will be crucial in enhancing the appeal of published games.

Limitations

Even though this study has a good display and answer to research questions, limitations could be displayed in this study and should be acknowledged. First, all interviews were conducted online via Zoom call or phone call due to the practicality of the situation. While this approach was convenient for reaching a larger pool of interviewees, it may have created difficulties during the interview process. Technical issues, like unreliable internet connections, audio quality issues, and video delays may interfere with the interview and may even result in data loss. Additionally, since the interviews lasted between 40 minutes to one hour, some interviewees may have become distracted at times, which may have affected their ability to respond appropriately to certain questions. Without in-person interviews, non-verbal information is often not fully captured, which may lead to misunderstandings of the emotions and attitudes of the interviewees.

Another limitation concerns the sampling strategy used in this study. Due to the time constraints and practical considerations, the data collection process fails to see the variety in country, gender, and experience level. Owing to the limited and scattered number of Fallout 76 game players, the author posted interview invites to the international community and the Chinese community. However, all respondents for this study were from China. The Chinese community is where the author actively participated, so it received a positive response. Time is limited for the article and cannot wait for more international community respondents to be interviewed. Besides, among 13 interviewees, only one female participated in this study and the rest of 12 were all males who were the dominant game-play groups, which might not have a balanced gender consideration. Moreover, all participants were experienced in video games with a minimum of years of gameplay experience and 200 hours in Fallout 76. However, different genders, game experience levels and cultures, and social backgrounds have various perceptions and experiences with sustainable initiatives, which could have influenced their feelings and answers, then influencing the results of the study. Therefore, caution is warranted when generalizing the findings to other populations.

We were aware of the limitations and made efforts to overcome them. To address issues related to the quality and accuracy of data, we obtained additional responses from the interviewees and asked them to reconfirm the transcriptions of their interviews. However, the limitations of this research indicate the need for future studies to consider the variety of samples and include various nationalities, genders, and experience levels, and adopt alternative methods of data collection, and include a more diverse sample.

Although this study displays the basic fact of affordance and value co-creation experience in RPG games and the general relationship between them, we cannot exactly define what specific impact different affordances may have on each value co-creation experience element, and their further relationship could be concluded in future study. To find out their deeper relationships, more detailed interviews could be done to further interpret player's engagement in RPG games, and qualitative research is also suggested to be used in addition to further research. Last but not least, this study focused on the feelings and stances of gamers and did not collect data from game designers or game companies, hence further research could also take a different perspective and do research on game designers to have a comprehensive picture of the affordances and value of co-creation experience.

6.5 Conclusion

In this thesis, we have optimized and expanded upon Hussain's framework of value co-creation experience (2023), which focuses on five aspects: super functionality, competitiveness, sociability, personalization, and self-indulgence. As a result, we have summarized seven co-created values experienced by players during MMORPG games: emotional value, self-development value, sociability value, personalization value, super functionality value, community building value, and creative collaboration value. These value points represent important elements pursued and experienced by players throughout the gaming process.

Firstly, we have found that players' emotional experiences extend beyond mere self-indulgence to include emotional connections and immersion within the gaming world. This finding enriches the understanding of emotional value, allowing players to more deeply engage in the game and experience a broader range of emotional states. Secondly, we have enriched competitiveness value by introducing the concept of self-development value, which emphasizes not only competitiveness but also elements such as skill improvement, creativity, and achievement satisfaction. These newly identified elements enhance competitiveness value,

enabling players to better achieve personal growth and development within the gaming context. In terms of sociability, personalization, and super functionality, our findings align with Hussain’s value model. Players engage in team cooperation, social communication, and seek personalized gaming experiences such as character customization, difficulty adjustments, and game content customization. Additionally, the value of super functionality provides players with unique experiences and a range of benefits and advantages.

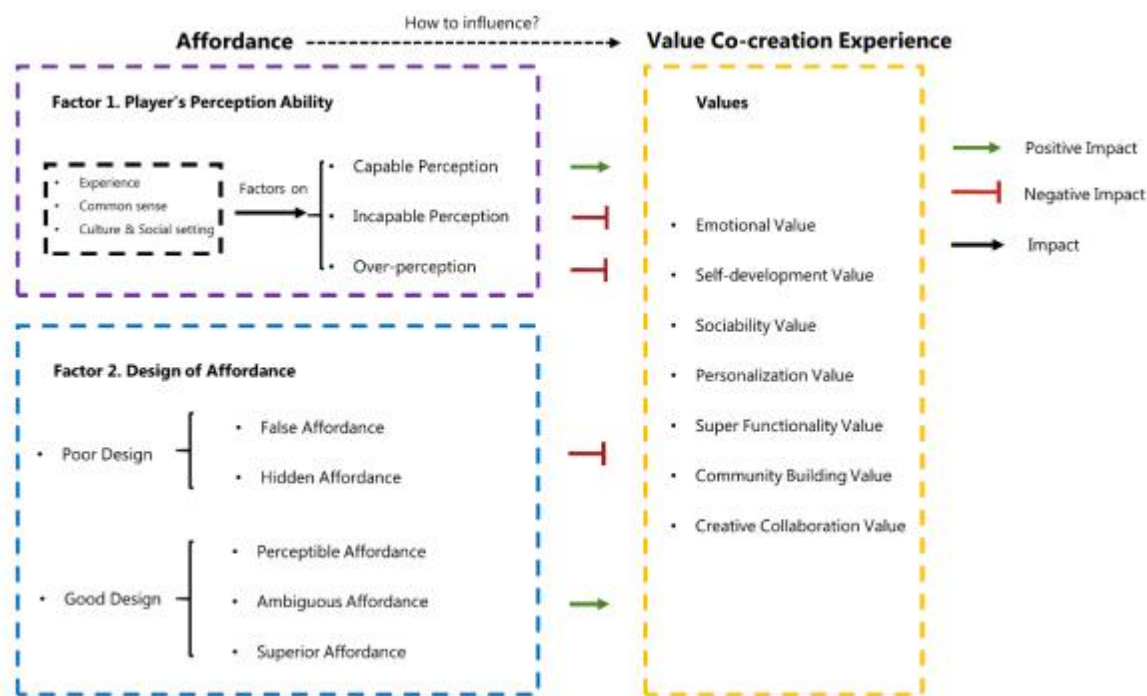


Figure 3. Schematic presentation of value co-creation in RPG games and impact brought by affordances

However, the aforementioned five points primarily focus on the intrinsic values co-created by players. Our research also identifies externally co-created values in RPG games, such as value for other players, including community value, emphasizing mutual assistance, identity recognition, and emotional connections among players, as well as the establishment of gaming fan cultures. Furthermore, it includes value for game developers or designers, where players interact and collaborate with game developers, enabling deeper involvement in game creation, design optimization, and fostering innovation within the gaming industry.

Values co-created by players in RPG games are dynamic and subject to change. Firstly, players’ co-created values evolve with their gaming experience and progression, fluctuating alongside

factors such as playtime and in-game level. Different stages of gameplay prompt players to pursue varying values. Secondly, various types of value may not manifest simultaneously, as players prioritize certain values based on their needs and circumstances in different gaming contexts. Lastly, as players mature within the gaming environment, many shift their focus from intrinsic values towards a greater emphasis on extrinsic values, such as community building and creative collaboration value.

In addition to exploring the value co-creation by players in RPGs, this study delves into the impact of affordance on the value co-creation experience. We have summarized both subjective and objective factors in this regard. Subjective factors refer to the perception capabilities of players, wherein capable perception exerts a positive influence on the experience of value co-creation, while incapable perception and over-perception yield negative effects. Objective factors pertain to the design quality of the game itself, where poor design elements such as false and hidden affordance adversely affect the gaming experience. Conversely, well-designed elements such as perceptible, ambiguous, and superior affordance contribute positively to the gaming experience.

Capable perception is crucial as it allows players to accurately perceive and interact with affordances within the game environment, facilitating smoother gameplay and enhancing their sense of immersion and engagement. Players with capable perception are better able to understand the affordances presented to them, enabling them to make informed decisions and participate more effectively in value co-creation activities within the game. On the other hand, incapable perception hinders players' ability to recognize and utilize affordances, leading to frustration, confusion, and ultimately a diminished experience of value co-creation. Players may struggle to navigate the game world, miss out on important cues or opportunities, and feel disengaged from the overall gaming experience. Over-perception, while less common, can also disrupt the value co-creation experience. Players who perceive affordances where none exist may waste time and effort pursuing futile actions, leading to feelings of dissatisfaction and disorientation.

Turning to objective factors, the design quality of the game affordance significantly influences the experience of value co-creation. False affordance, for instance, presents players with misleading cues or prompts, leading them to take incorrect actions or follow unproductive paths. Similarly, hidden affordance presents players with challenges or opportunities that are not readily apparent, requiring them to invest additional effort in uncovering and understanding

them. The poor design of affordance can disrupt the flow of gameplay, reduce player satisfaction, and impede the realization of value co-creation objectives. Conversely, good design of affordance such as perceptible, ambiguous, and superior affordance enhances the value co-creation experience in game. Perceptible affordances are easily recognizable and understood by players, facilitating smooth interaction and engagement. Ambiguous affordances, while less explicit, invite players to experiment and discover new possibilities, fostering a sense of curiosity and agency. Superior affordances, characterized by their high-quality design and functionality, offer players rewarding and superior experiences, further enriching the value co-creation process.

In conclusion, this thesis has contributed to enriching the study of value co-creation in RPG games and has also explored the impact of affordance on players' value co-creation experiences. By shedding light on these aspects, it provides an enhanced perspective and insights into understanding players' value co-creation process.

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Appendix

Appendix 1 Interview Guide (Interview Questions)

The targeted groups:

Fallout 76 enthusiasts (with the Fallout 76 gaming experience)

Confidentiality & Anonymity

Thank you for your cooperation and participation in the interview. We are master's students from LUND University, currently working on a master's thesis about the affordance of RPG games, namely the possibilities that environment offers to players and their value co-creation experiences. Affordance in this context refers to the elements that a game provides for players to interact with.

We assure you that your personal information will remain anonymous, and any recorded audio and transcriptions will be solely used for the purpose of the thesis. If you find any questions sensitive, please feel free not to answer. Let's begin the interview:

General questions

1. Could you briefly introduce yourself? For example, your gender, age range, student or employee, and how long you have been playing video games?
2. What is your favorite type of video game (e.g., RPG, action, strategy, adventure, sports)? Could you describe some of your favorite games, including any belonging to the role-playing genre?
3. How long have you been playing "Fallout 76," in terms of years or approximate hours played?
4. What attracts you to this game, and what specific features or advantages of the game do you find appealing?
5. How would you describe your overall gaming experience with "Fallout 76," including in-game experiences, post-game experiences, and interactions within the community?

6. How is your play mode in Fallout 76, like playing this game alone or completing tasks/missions with friends or other players in a social community?

7. Have you subscribed to any membership options for “Fallout 76”?

Questions related to value co-creation and affordance:

8. What are your thoughts on the overall game design of “Fallout 76”?

9. How do you feel about the game design elements? (Hints if no further reply: textual clues, icons, buttons, voice prompts, task instructions, menus, and rules that construct the game's environment) How do these designs assist you in interacting with the interface?

10. How do these design elements affect your freedom and experience to play the game?

11. How do you understand the meanings represented by these design elements and how they guide your actions in the game? Could you provide examples?

12. What do you think your understanding of these design elements relies on? How active do you feel you are in interpreting and responding to these cues?

13.1 If you have subscribed to the first-tier membership, do you believe it has provided you with more freedom? Why?

13.2 If you haven't subscribed to the first-tier membership, why not? Do you think subscribing to the first-tier membership affects your freedom in “Fallout 76”? How does the membership impact this?

14. What do you feel you gain from playing this game, or what unique value does “Fallout 76” offer you?

15. How do you contribute to the value co-creation with other players in the game, such as completing group tasks, exploring together, or exchanging experiences within the game community? Could you provide examples of how you co-create value with other players?

16. What value do you believe you create while playing the game, and how does it differ between group value co-creation and solo gameplay?

17. How do game design elements affect your gaming experience, and how does the environment's affordances impact your experience?

18. How do game design elements and your freedom of action influence your teamwork with friends or other players in the game, as well as your solo gameplay experience?

19. How important is your understanding of the game's design elements to your overall gaming experience?

We sincerely appreciate your participation in our interview. We want to assure you that your privacy will be maintained. Thank you.

Appendix 2 Four Generations of Video Games

The first generation can be traced back to the 1970s, when commercial video games were available like Pong and Space Invaders. In this early age, to introduce an enjoyable gameplay experience, video games design was simple and simple affordances were provided with light signals to place on TV's screens to form two-dimensional graphics (Ivory, 2015; Pelovitz, 2014). Simple controls and text representations were set to offer interactions between players and game, like using Magnavox Odyssey which was the first commercial home video game console (Kirriemuir, 2006). Single-player mode was the primary play mode and two-player mode appeared in competitive games. Video games in the era relied heavily on simulations of competitive activities, which were mainly action, combat and sport games as main themes (Ivory, 2015; Pelovitz, 2014).

Personal computers witnessed a rise in the 1980s, when digital games were integrated into player's lives as a part of pop culture. The second generation of video games became diverse and were heavily improved in graphics and sound, owing to the introduction of micro interaction relied mainly on text input and output of players in game programs. Although single-player mode was still dominant, multiple-player mode could see an increasing trend. With an improvement in graphics, games themes were extended, like fantasy themes in Pac-Man and role-playing game in Ultima IV: Quest of the Avatar (Ivory, 2015).


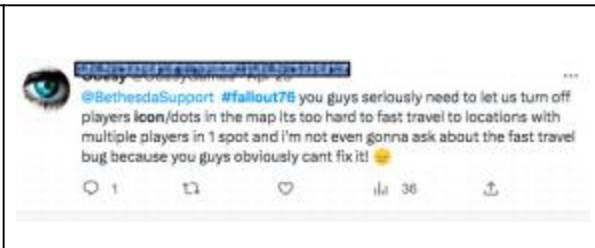




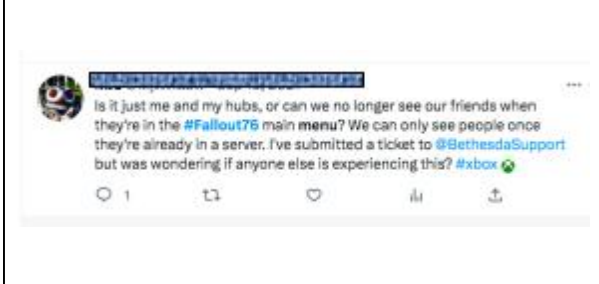



Third generation of video games from 1990 to 2005 was much more diverse and more global. Technological innovations were featured in the 1990s, for instance 3D graphics, higher capacity of processors, and better control interface, which provides greater audiovisual experience. The use of CDs allowed for more storage of data and multiple player sessions with Local Area Network and internet connection (Wolf, 2008). Multiple control options provided a higher level of choices and more diverse human-computer interaction could be found (Fabricatore et al., 2002). Online games, especially online multiplayer games, saw a significant growth (Mäyrä, 2008), while single-player mode still took a large market share. Action games like sport and war games still remained popular, with a certain amount of development of strategy games like chess and role-playing games.

The video game has continued to evolve since 2006, with new technologies and innovations, like new consoles to offer more powerful hardware and control schemes, and faster load time and also virtual reality (VR) for better experience (Kirriemuir, 2006; Wesley & Barozak, 2016).

With better graphics and physics engines, players can have more realistic and immersive game experiences. Better interactivity and more player choices facilitate exploration in the game world. Multiplayer mode is dominant and massively multiplayer online games are popular. Action and combat are still dominant and role-playing games are more popular among others (Shapiro, et al., 2012).

Appendix 3 Online Observation

Examples from Twitter and Baidu Tieba

 <p>The only good kind of player interaction is when there's no voice or text chat. I only have fun and experience real comradere with strangers when we have to communicate with emotes. Fallout 76 and Dark Souls/Elden Ring is what im all about with this</p> <p>2 replies, 33 likes</p>	 <p>@BethesdaSupport #fallout76 you guys seriously need to let us turn off players icon/dots in the map its too hard to fast travel to locations with multiple players in 1 spot and i'm not even gonna ask about the fast travel bug because you guys obviously cant fix it! 🙄</p> <p>1 reply, 36 likes</p>
 <p>Just learned that the public team menu in #Fallout76 shows an average of the players' level. How did I completely miss that?</p>  <p>8 replies, 26 likes</p>	 <p>Rad storms have always been my favourite weather. Once Fallout Worlds comes out i hope we can adjust weather and such. Walk through Atom's chosen lands.</p> <p>#Fallout76</p>  <p>1 reply, 2 retweets, 33 likes</p>
 <p>Is it just me and my hubs, or can we no longer see our friends when they're in the #Fallout76 main menu? We can only see people once they're already in a server. I've submitted a ticket to @BethesdaSupport but was wondering if anyone else is experiencing this? #xbox 🍀</p> <p>1 reply</p>	 <p>I'm reminded of when in Fallout 76 the players that bought the membership got a little medal icon next to their name. And all the none paying users hunted them down until they had to live in walled off bunkers.</p> <p>That was also funny.</p> <p>9 replies, 411 retweets, 1,785 likes, 42.6K views</p>
 <p>Things I'd like from @Fallout 76:</p> <ul style="list-style-type: none"> - All enemies when you're over level 100 are locked at level 100. Seriously, I'm level 700 now and still have to deal with level 50 Weak Feral Ghouls? - Couples poses for photo mode - More big boss fights like the Queen/Earle - Text chat <p>21 replies, 5 retweets, 74 likes</p>	 <p>Seems like players are not using the built in audio chat function, and there is no global server text chat option. #fallout76 needs text chat, like every other MMO I have ever played.</p> <p>9:47 PM · Nov 17, 2018</p>

 辐射4你可以自己改材质，画面，各种人物美化，枪械，上万种mod。只要你肯打mod，你可以把它变成塔防，变成cod，变成星际争霸。可以加入各种全新怪物模组，让你的每一次新档都是全新的游戏。不打mod也可以尝试各种流派，每一种流派也是全新的体验（一定要玩生存）。但是说白了就是个单机，玩久了会腻，尤其是联机，除非你是硬核玩家，逼逼可以玩很久，但是逼逼得了各种流派，沉迷。


打点好评  辐射76是纯网游，但实际玩法不多，后期也就混那两个打***oss，休闲玩家日常收集，不过比辐射4好的就是有玩家互动，没有那么孤独，适合上班族每天玩两个小时，也是说实话没啥有什么挑战性的副本之类的，玩多了也很无聊，太过于养老了，而且优化不是特别好，画质放在现在也不显突出，还卡。

 我玩到辐射就没有每天玩了，游戏是停服三百多级的大号，不过这游戏，反正不能交配，好像都不是中国人，因为我加过一次开麦的队伍，说的有口音的英语，平时交流只能发表情，不擅长文字交流方式。


打点好评  国内玩家确实少，想组队聊天的话建议群里找人，一般他们都开群语音或者yy，因为游戏语音老是会掉（就是喇叭后面一个叉）需要重新连游戏才能解决，很烦


打点好评  这款游戏语音有问题，就不好用，朋友组队大都另外开个语音，所以你基本听不见别人说话


2023-4-18 12:25 回复

打点好评  国内玩家确实少，想组队聊天的话建议群里找人，一般他们都开群语音或者yy，因为游戏语音老是会掉（就是喇叭后面一个叉）需要重新连游戏才能解决，很烦

2023-4-18 12:24 回复

打点好评  这款游戏语音有问题，就不好用，朋友组队大都另外开个语音，所以你基本听不见别人说话

 讲真，这翻译是人翻的，并且是在没有游戏的情况下，只有文本硬翻译，之前有个福特是跟谈C点还是B点就忘了，翻译前还打了括号说他不确定是不是，就看得出来翻译并不是个懂游戏的玩家或者军事爱好者，因为AA就是alpha team B点就是bravo team,C点就是charlie team，D点就是delta team，美国海军陆战队常用词，你知道原来那些中文mod为什么也会很好嘛？因为翻译的人玩过游戏，并且在玩的同时一直在修正，而这里的官中，是一开始就翻译并没有修正的，所以质量堪忧，但是也能不让人翻译。

打点好评 

打点好评  可能指代四代小麦克森领导的那个兄弟会，看着200年吧！这样说确实还没出生。

2021-7-24 09:04 回复

打点好评  说来惭愧，我入坑辐射最早和玩的最长的就是辐射4，后来才稍微碰了一下nv和没汉化的2代，“旧辐射”在剧情上确实可圈可点。文本量很大，与之相比，作为“新辐射”的代表作之一，辐射4在剧情上就稍微单薄了点，但胜在精细的3d化世界和玩法上。

2021-7-24 09:30 回复

打点好评  辐射76则继承了新旧辐射的特点，3d化的世界配上文本量超大的剧情(是的，76感觉剧情单薄，但是由于暗线剧情很多，文本还零散)，有生之年如果前代能3d重置一下，那必将是游戏界的大板砖

2021-7-24 09:32 回复

打点好评  神威yyds,我玩的时候剧情说怎么看仔细，看了神威的小说，才知道这

可以显示不同的资源，可以显示/关闭地图上的图标，玩家图标等等，右键还可以直接快速传送一些地方，不用再拖地图了，如图三，可以选常用地点，各大车站等等，哈哈哈，很强大，哈哈哈哈哈



这个问题相信大伙应该都知道，但也不排除有一部分76小子是感觉信任一直没什么人光顾，所以在这里想给大伙做个小提示，平常camp的公共地图记得打开，如果不开的话是不会显示在地面上的，只有队友能看见你的camp，因此如果没注意这个问题的话很可能不是账号亏了一个亿



US-HIDINDA


辐射76的任务是不想让人做吗，完全都不看头数，已经是不止一个任务了，很多任务不上网查都不知道怎么完成，有没有做过的给指点一下，网上都查不到这个怎么做，在做的东西



辐射76的... 任务... 感觉... 不好... 换... 一晚... 上... 这个... 新手... 任务... 日记... 都... 是... 后... 上... 网... 搜... 找... 的... 玩... 的... 时... 候... 手... 机... 和... 任... 务... 指... 示... 太... 长... 了... 反... 欲... 甚... 速... 去... 看... 了... 下... 游... 戏... 老... 哥... 去... 了... 解... 下... 游... 戏... 老... 哥... 去... 了... 解... 下...

改不了，这游戏技能设置特别蠢，上行操作键设置的时候被他一下硬直了就直按变成侧动力甲，网络卡的时候它地暴盾也经常变成盾，在视野不好的地方一按就看不到敌人，直到落地之前都没输出能力

玩家玩的就是这种无牵无挂的感觉吧，不需要打战绩也不需要搞什么团队配合，有这这想想就爽，轻松，安逸，无聊，大概就是这个76小子的日常



单论本线（包括dlc）时长的话，是挺简单好刷的，估计玩上100个小时也差不多（因为地图比较大且地点之间距离比较近，所以赶路会消耗大量的时间），支线则比于辐射系列的剧情们算是比较简单，极少能给人留下深刻的印象。虽然是个网游，但是它的社交属性的下限还是挺低，一大部分的玩家们的心态就是组队但是各玩各的，就算一起组队下副本，也不需要有什么交流（因为副本的关卡设计非常谨慎，基本上不会涉及玩家之间的分工合作）。说实话，辐射76虽然允许你把它当成单机玩的同时获得很好的体验，但是它的特色还是联机，要是你真的喜欢单机类土星题材的第一人称RPG，那还是去玩辐射76吧。辐射4有玩过辐射76更合适

同样从4代过来的，4代我玩了3000小时，76不开控制台。大部份玩家都是友好的，会给新手一些自己不能做但新手能做的帮助。不过也有恶意的，过了新手保护期就开了开和平模式，那神开了和平也打的人，游戏设定还开了不开PK，不用还合，封禁他就好，有人把家重装备偷，弄成局时，买东西时会中陷阱，去买东西时陷阱会炸，中了陷阱也封禁他。还有新手可能出的问题，不要开挂，不要挂没学的金条武器装备，不要挂没学的东西，也不要挂没学的东西，严重时会被封号，辐射4控制台的，给到去喝点东西，76通常不用了控制台，用特殊手段使用控制台，这喝点东西也是禁上的，有套衣服叫干净毛巾，是套有套的，有人在闲鱼卖，穿了有人举报，你就被封号了，金条武器没学过的套套没学过的套套，是得不到的，无法拒绝，别人也得不到的，有人开挂把金条武器挂掉，再让别人挂，这样在闲鱼卖，你不会就没了，这不可能被封号，主要原因是开挂作弊，你除了他的你一起被封，甚至有人闲鱼卖金条武器，实际是来开挂，不要给他号，2月时贴吧里有人在闲鱼买干净毛巾加金条武器，就被封号了。

我会是辐射老玩家，辐射主要作品都玩过，就你的建议是可以玩，基本就能理解辐射4的差不多，弹药，建材有重要，真想玩冲个会员也能解决以上问题，至于游戏性和操作性基本和辐射4差不多，还是符合辐射系列的要求，至于什么网络联机，由于地图大，每个公共地图容纳玩家数有限，超过了就会新开地图，所以离开公共事件，你基本遇不到什么玩家，和平模式一开你完全可以当其他玩家是NPC，建造方面基本和辐射4差不多，没有前置限制，就是你只能建造这么多东西，所以需要好好计划，总之剧情方面完全可以当单机玩，过完剧情就可以当网游去玩，对于辐射系列玩家来说还是不错。