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A Consumer Perspective on Digital Games

Factors for successful game development.

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CONTEMPORARY DIGITAL GAME DEVELOPMENT COMPANIES offer a variety of games for diverse consumer tastes. One important game-development factor is considering the consumer perspective. Game development is a complex task, and measuring the consumer experience of games poses an additional challenge. For the successful development of high-quality digital games,

the developer must consider and explore all related dimensions as well as discuss aspects with the stakeholders involved. The main contribution of this article is to investigate key consumer factors for digital games that have been reported in studies from the literature.

GAME USABILITY AND PLAYABILITY ASPECTS

Digital games have expanded globally throughout the leisure and entertainment market. The fast-growing digital game-development industry produces highly interactive

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software, such as video games, online games, and mobile games, for a wide variety of platforms, including consoles, personal computers (PCs), mobile devices, and web browsers. The current digital game-development process consists mainly of a synopsis, background research, script writing, visualization and concept art, level and interaction design, animation, programming, media editing, integration, testing, and publishing. The complexity of the digital game-development process is increasing, which hastens the need for a mature development process.

The consumer is the person who purchases games for personal use, so, in this context, the word *consumer* is synonymous with the term *player*. Kotler [1] explained that ensuring consumer satisfaction is a crucial aspect of the game-development process [2]. Thus, to gain insight into consumers' preferences for the digital games they want to play, it is important to appreciate the factors that influence their buying decisions and playability desires. Broadly, game-development companies can benefit from general usability evaluation methods [3], but there are significant differences between general software applications and digital games. An integral part of a game is the design of meaningful challenges, which is quite a different task than developing easy-to-use software so as to minimize cognitive load. Hence, playability is considered to be somewhat different from general game usability [4], [5].

Nacke [6] stated that the most important quality factors considered by consumers for digital games are usability and playability. Usability (ISO/IEC 25010) [16] can be described as the level to which a digital game is learned, understood, used, and remains attractive to the consumer under specific conditions. Playability [4] evaluates digital game play or interactions based on certain criteria. Normally, the usability of any game is measured at a very late stage of the game-development process, whereas playability is assessed using early prototypes or iterative cycles during development. The key playability factors along with the usability factors increase the tendency of consumers to play the game repeatedly. However, the current game-development process is unable to fully satisfy these requirements [7]. Exploring diverse consumer gaming preferences can reveal insights that can be used to improve the digital game-development process and ultimately lead to a more successful product.

DIGITAL GAME CONSUMER PERSPECTIVE: RELATED WORK

A game is nothing without players, and play is an integral element of any digital game. The literature demonstrates that researchers have taken into account various perspectives of digital game consumers [9], especially in the processes of game development and design [10]. Sotamaa et al. [11] emphasized the importance of players in developing a high-quality digital game. The primary focus of their research was on the evaluation method and on integrating elements of play into game design by introducing an active dialog between the player and developer. Song and Lee [12] identified key evalu-

ation factors for game design, especially for massively multiplayer online role-playing games (MMORPGs), through a usability evaluation. They identified 54 key factors after conducting experiments on commercially available MMORPGs and divided them into four categories.

The first category was the game interface, which included feedback, control, metaphor, consistency, flexibility, recognition, aesthetics and minimalist design, affordance, help, and natural mapping. The second was game play, which included goals, rewards, learning, pace, pressure, challenges, empathy, replayability, fairness, balance, difficulty, and perceptual motor skills. Game narrative was the third category, and it involved evocative space, embedded narrative, enactment of stories, emergent narratives, curiosity, interaction between players, and narrative and modeless operation. The last category was game mechanics, which included factors such as physics tendency, immediate display, and vividness. This research has extended these current game evaluation methods and identified implications for improving digital game quality at any design stage. The study was conducted on a group of students from South Korea, and, therefore, the validity of the results is subject to cultural limitations.

Sanchez et al. [13] highlighted the importance of the playability factor for video game development and emphasized that it must be taken into account throughout the game-development process. They stated that to analyze video-game quality, usability alone is not enough; playability also has to be considered. Usability captures only the use of the game, but playability goes beyond that, especially in the case of digital games. They defined playability as "a set of properties that describe the player experience using a specific game system whose main objective is to provide enjoyment and entertainment by being credible and satisfying, when the player plays alone or in company." Therefore, playability is not limited to subjective factors like fun and entertainment but needs to cover other consumer dimensions, such as satisfaction and credibility. The playability of a digital game can also achieve set goals with effectiveness and efficiency, depending on the context of use and whether the game also offers fun and satisfaction. Based on their analysis, they proposed seven attributes that characterize video-game playability: learnability, satisfaction, effectiveness, motivation, immersion, socialization, and emotion. They claimed that consideration of playability factors while designing a game will help to improve the quality of the video game.

Schoenau-Fog [14] developed a survey to investigate the components and the triggers of player engagement in digital games. As a result of this survey, the proposed categories were structured into four components: objective (extrinsic or intrinsic), activities (exploring, interfacing, socializing, story, or character experience), accomplishment (progression, completion, or achievement), and affections (abortion, positive, or negative). These components included categories that are vital to investigating key aspects of the player's engagement process. The main limitation of the study was that it was restricted to one group and one game, and it had open-ended questions.



Consumer enjoyment has been viewed as a central component of games, especially digital games.

Fernandez et al. [15] discussed video-game evaluation from the model-driven development perspective. They presented a usability evaluation method that can be used in all stages of development. The proposed method used the ISO/IEC 25010 [16] standard and defined attributes and metrics especially for the video-game domain. The attributes were appropriateness, recognizability, ease of use, learnability, helpfulness, attractiveness, and technical accessibility. This method of evaluation is limited to the early stage of model-driven development.

The few researchers who considered consumer-centered factors in the digital game-development process did so with limited scope [8]. In this article, we survey the literature and present the five factors we consider to have the most impact for successful game development.

KEY CONSUMER FACTORS

In the past, researchers have highlighted the concept of a consumer-centered approach to the game-development process. The following five important factors were identified from the literature as elements that can directly or indirectly contribute to the development of high-quality digital games from the consumer perspective.

CONSUMER ENGAGEMENT

Consumer engagement, an important aspect of any successful product, is also considered critical for digital game success. Charlton and Danforth [17] defined engagement as “a high degree of involvement in computer usage.” One of the main issues highlighted in their research was the psychological behavior of addiction to computer-related activities from which consumers can suffer [18], [19]. They stated that this type of behavior was related only to personality variables (i.e., low emotional stability or high extraversion) and was not considered as an engagement factor.

Several studies have been carried out by researchers to investigate the consumer engagement concept in digital games. This concept is closely related to the consumer level of motivation in terms of presence, immersion, or perceived realism. Presence is the most popular concept in terms of consumer engagement, and it is well adapted to the digital game environment. Stanney and Salvendy [20] defined presence as “the subjective experience of being in one place or environment even when one is located at another.” Lee [21] proposed three dimensions of presence: spatial presence (associated with distant or virtual objects), social presence (associated with distant or virtual social actors), and self-presence (associated with a represented self or virtual actor). Retaux [22] suggested a method to evaluate variations in presence using video

recording during a single game session and authenticated it by case study. The concept of immersion is a “psychological state characterized by perceiving one’s self to be enveloped by, included in, and interacting with an environment that provides a continuous stream of stimuli and experiences” [20]. Based on game narrative factors, Qin et al. [23] proposed a survey questionnaire for immersion and validated it for seven factors in the game narrative: concentration, curiosity, empathy, comprehension, challenge, familiarity, and the skills and control of corresponding players. Jennett et al. [24] suggested an experimental method to evaluate the player’s level of immersion by recording eye movements. The researchers agreed that the immersive tasks within the game help a player to pay attention to important game tasks. Malliet [25] referred to the subjective realism that a game consumer experiences with respect to the virtual world as perceived realism. Ribbens and Malliet [26] proposed that the perceived realism of a video game depends on many factors from the virtual world, such as freedom of choice, realism of the simulation, authenticity of subject matter, character involvement, authenticity of characters, perceptual pervasiveness, and social realism.

The engagement factor for digital games is a complex topic. Researchers have approached this from different, yet overlapping, perspectives. For example, some have used the presence concept to describe a kind of psychological state in which a player experiences the virtual world as a real world [21]. However, some have questioned how presence contributes to the player’s experience and finally leads to enjoyment. Arguably, similar concepts have been explored under different names along with their own scholarly foci and rationales; these concepts include absorption, immersion, and realism. Several studies have discussed the concept of engagement in digital games and have proposed various methods for evaluating the engagement process, e.g., Schoenau-Fog [14]. Usually, the term *game engagement* in digital games refers to the consumer experience during game play and is strongly related to the level of motivation expressed by the consumer. The consumer engagement variable for measuring the success of digital games has not yet been explored in the literature. The game engagement factor in the digital games considered by this study consists of presence, immersion, and perceived realism as experienced by game consumers.

CONSUMER ENJOYMENT

Consumer enjoyment has been viewed as a central component of games, especially digital games. The enjoyment factor in games can be described as the positive response of an individual to the game content and its media technology. Enjoyment is also seen as a central concept in human–computer interaction and is a frequently assessed dimension when measuring user experience.

The concept of enjoyment within digital games is interpreted differently across genres, individuals, content, and platforms. It is important to study how it is discussed by researchers because this will provide insight into our understanding of the digital game enjoyment factor from a consumer perspective. Similarly, Sweetser and Wyeth [27] also stated that the definition

of game enjoyment is vague in the literature because it is not well differentiated from other related psychological concepts. Fang et al. [28] studied enjoyment and referred to it as a positive reaction of the player during a particular game session. They developed a questionnaire based on three dimensions of enjoyment: affective (linked to the player's affective state and emotions), behavioral (linked to the player's behavior during the game session), and cognitive (linked to the player's judgments about the game elements). The enjoyment factor for websites has been well operationalized and conceptualized, but this concept cannot be applied to digital games because the central goal of a game is enjoyment, whereas websites mostly have utilitarian goals.

Takatalo et al. [29] provided an overview of the enjoyment factor as a subjective experience. Most researchers have equated enjoyment with the flow experience [27], because flow is linked to the subjective experience of challenging activities based on a euphoric state of involvement and concentration. Some researchers have argued that enjoyment can also occur without a flow experience [18], [29]. Fang et al. [30] developed a questionnaire based on different components of flow to measure it in video games. Brockmyer et al. [31] proposed a game engagement questionnaire to measure engagement in playing video games and considered enjoyment as a multidimensional construct that combines positive affect, competence, challenge, and the absence of frustration, whereas flow is about an involvement construct, including boredom and immersion.

Mekler et al. [32] performed a systematic review to analyze measures and the operationalization of enjoyment in digital entertainment games. They proposed that flow is different from enjoyment and may occur independently of cognitive involvement and challenge. They also considered enjoyment as a value of the player experience.

GAME CHARACTERISTICS

An understanding of game characteristics, particularly of game content, from both developer and consumer perspectives is very important in digital games. Characteristics of games include a user interface (output/input techniques), rules such as game challenges or levels of difficulty, interactive features, skill requirements, reward/effort ratio, and game narrative. All of these characteristics of games have been studied by researchers, and most game characteristics have been studied independently. The output techniques for digital games commonly involve auditory and visual information. Typically, the output interface consists of certain objects within action scenes, such as avatars, targets, or enemies, and a moving, complex background. Usually, the main action scene contains a "heads-up" display to provide contextual information. Auditory information is also included within the digital game to facilitate the consumer experience. Wolfson and Case [33], Caroux et al. [34], and Sabri et al. [35] performed experiments to show that the background and arrangement of contextual elements, such as heads-up displays, have an impact on the performance of the digital game consumer.



Ease of use for digital games means that the consumer can easily manipulate the controls within the game to take actions that help in achieving the goals of the game.

Several studies have investigated the impact of output techniques, such as the influence of auditory information, the representation of the virtual world, and the quality of displayed information, sound, and music, on the player experience in digital games [36]. The input techniques can involve devices like a controller, joystick, computer keyboard, mouse, or combinations of these, plus other input methods based on touch, motion, gaze, tangibles, or brain control. Researchers have also widely studied the impact of input techniques on consumer experience [37], [38].

Game challenge or the level of difficulty is another important characteristic. Few studies in the digital game literature have discussed the impact of challenge characteristics. Qin et al. [39] studied how varying the level of difficulty impacts consumer immersion. Liu et al. [40] provided a comparison between two systems of dynamic difficulty, where challenges were based on either the consumer's level of anxiety or his/her performance, concluding that the former has a greater positive impact on the consumer's experience. The results of the study showed that the consumer's experience was better when it was based on level of anxiety. Shaker et al. [41] also investigated dynamic challenges in games based on the consumer experience.

The challenge of a digital game should be varied and gradually increased to maintain the level of interest within the game. When a consumer develops mastery, the game should provide more challenges. The match between the challenge and the consumer's perceived skills for an activity is an important precursor of flow. If the difficulty level of the challenge is higher than the perceived skill of the consumer, then playing it results in anxiety; if it is lower, then playing it results in apathy.

Another important characteristic of game play is the game narrative. Digital games generally include a story line, and Choi et al. [42] showed that fantasy in a storyline enhances motivation and immersion in video games. We proposed four scale factors to evaluate the fantasy state in games: identification, analogy, imagination, and satisfaction. Park et al. [43] also evaluated the role of narrative in video games and showed that it increases player presence. They compared the game with a situation in which the player saw a presentation of the technical aspect totally disconnected from the game narrative.

EASE OF USE

Ease of use reflects "the degree to which a person believes that using a particular system would be free of effort" [44].

Therefore, ease of use for digital games means that the consumer can easily manipulate the controls within the game to take actions that help in achieving the goals of the game. Ease of use in digital games also includes attributes like control consistency and internal and external navigational consistency.

Davis and Sajtos [45] and Newman [46] argued that ease of use in digital games results in a higher level of interactivity for consumers. Ease of use is considered to be a fundamental driver, especially with marketing-related products like digital games. Davis and Lang [47] explored the relationship between user game purchase, usage behavior, and ease of use. They conducted interviews based on a structured questionnaire, using four competing models of digital game types: all games (the original model), MMORPGs and role-playing games generally, sports/simulation/driving games, and action/adventure/fighting games.

In digital games, ease of use consists of all the attributes of the digital game that help its consumer control and operate the game easily, either inside or outside of game play. Ease of use is the most discussed and least understood aspect of digital games. The literature has shown that digital game consumers prefer to use and purchase digital games that are easy to use (Apple Mac or PC and/or games on a console, such as for their Apple iPad, mobile phone, Sony PlayStation, Microsoft Xbox, or Nintendo Wii).

SOCIALIZATION

Digital games give rise to meaningful and engaging social interactions. Socialization has now become an important feature of digital games in today's world, although it is not a game characteristic that provides flow or immersion but rather an opportunity to promote the social dimension of digital games. It enables a game consumer to socialize with his or her friends and share game experiences. Sanchez et al. [13] studied the usability and playability of video games and proposed that the socialization attribute has certain properties. The properties of socialization include social perception (including the degree of social activity as understood by its consumer); awareness, meaning that consumers have a sense of sharing objects or being part of a team; personal implications, meaning that each consumer knows how his or her action leads to group or individual victory; sharing, including an understanding by the consumer of how to manage resources or common objectives within a group; communication, which provides mechanisms to support successful information exchange; and interaction, including ways to support communication among consumers. Very few researchers have studied the socialization attribute of digital games.

DISCUSSION AND CONCLUSION

Digital gaming has become a mass phenomenon, and the intensity of competition within the industry is increasing. Game-development organizations must pay close attention to consumer preferences in the game-development process if they are to remain competitive in the market. This article compiled the consumer factors that are considered the most relevant to game success.

The literature suggests that consumers of digital games are motivated to play games mainly due to the enjoyment factor, i.e., positive experience during a game play session. Game developers have mainly been employing usability guidance tools as proxy heuristics for the enjoyment factor; thus, developers' estimations of a game's enjoyment factor may not match the consumer's experience.

This study is a part of a larger project aiming to propose a digital game maturity assessment model [48]. Rapid and continual changes in technology and intense competition necessitate that game-development organizations must adopt an effective evaluation methodology to remain competitive. The consumer perspective is one of the identified dimensions in addition to the developer [49], business [50], and development process perspective itself. The findings of this article justify the inclusion of these factors in an assessment methodology.

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