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Analysis the Enhancement of User Game Experience Based on Digital Media Designing

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Abstract: In the context of the digital era, video games, as an emerging form of entertainment, have become the focus of research in terms of their design and optimization of user experience. This study focuses on the application of digital music in games and its impact on player experience, aiming to reveal how music elements deepen the immersion and emotional resonance of games. According to the analysis, digital music significantly enhances game immersion and players' emotional engagement through dynamic music systems, close integration with game narratives, and innovative applications in virtual reality (VR) and augmented reality (AR) games. In particular, games such as Traveler provide players with a unique empathic experience and deep emotional impact through well-designed music and sound interactions, demonstrating the central role of music in enhancing game narratives and building game worlds. However, the study also points out the technical, subjective, and culturally sensitive limitations of digital music in game design, challenges that need to be faced and overcome by future game developers and music creators alike.

Keywords: Digital games, digital media, music, user game experience

1. Introduction

In the context of evolving digital media, video games have become an important platform for immersive storytelling and interactive experiences. The integration of digital music within this space plays a key role in shaping the user experience, not just as a background element, but as a foundational component that enhances emotional engagement, narrative depth, and the overall immersive quality of the game. The intersection of digital music and video games represents a dynamic synergy between audio and visual stimuli, creating a multi-sensory experience that can significantly enhance the emotional impact and engagement of the player. Music in games is not just a passive backdrop, but an active participant in storytelling and environment building. It can set the tone, influence the tempo, evoke emotions, and even change the player's perception of time and space in the game world [1]. Digital music plays an important role in shaping the atmosphere and emotional landscape of a game. For example, background music in horror games can increase suspense and bring about a sense of tension and anticipation [2].

User experience is an important part of the field of computer science. It emphasizes the consideration of users' emotions and attitudes to improve the quality of software interactions, usually focusing on the interactive aspects. However, for video games as a media category, UX can be extended to the concept of "player experience" [3]. In the history of video game development, Nutting Associates' Computer Space was the first game to include sound [4]. Later in 1978, Space Invaders

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not only added continuous background music to the game, but also created an interactive link between the music and the player [4].

The usage of MIDI (Musical Instrument Digital Interface) technology allowed for richer timbres and more complex arrangements of music without taking up a lot of storage space [5]. In addition, the popularity of CD-ROMs has broken new ground in the development of game music, allowing game producers to integrate high-quality recorded music into their games. In addition, game music is becoming more diverse in its composition and presentation. The use of symphony orchestras can make the visual and sound effects of games form a harmonious situation and enhance the aesthetic characteristics of games [6]. Therefore, the cooperation between games and symphony orchestras not only gives game music deeper emotions and richer layers, but also greatly enhances the overall texture and depth of the game. It ranges from sadness to joy, from serenity to tension, providing players with a more immersive experience. For example, The Legend of Zelda extensively used a symphony orchestra to record its music [7]. These musical compositions not only add to the game, but also become works of art that can be appreciated independently.

In recent years, music has played a key role in enhancing immersion, emotional expression and narrative devices in games. Digital music enhances player immersion by synchronizing with in-game events and environments. The tempo, style and intensity of the music can vary according to the specific scenarios of the game to reflect the player's emotional state or the tension of the game [8]. For example, battle scenes are often accompanied by fast-paced and high-intensity music, while exploration sessions may feature a more calming, exploratory music soundtrack. As technology advances, more and more games are adopting dynamic music systems, which are capable of adjusting music in real time based on player behavior and in-game events. This approach not only improves the interactivity of the game, but also makes the music an integral part of the game's narrative and experience. For example, some games change the musical theme or adjust the flow and layering of the music based on the path the player chooses or the progress of the game.

In some games, the music itself is part of the game mechanics. In this blend, music is no longer just a background element, but becomes an active factor in influencing game progression and player decisions. The game adapts the music to the player's actions and choices as well as to dynamic events within the game, allowing the music to respond to the state of the game in real time, creating a more personalized and dynamic gameplay experience. This convergence has pioneered new game genres, particularly rhythm games. For example, Eggman Party is a vibrant multiplayer online game in China that incorporates rich musical elements [9]. This type of game usually requires the player to maintain the rhythm while paying attention to the visual cues on the screen to ensure the accuracy of the movements.

The purpose of this study is to explore the multifaceted contributions of digital music to video game design and user experience, and to examine in more depth how background music, sound effects, and interactive audio elements can work together to bring about an immersive gaming experience for the player. Subsequently, the paper will start with a basic introduction to digital music, outlining specific scenarios in which digital music has been used to enhance the user or player experience. In addition, the paper will use Journey as a case study to analyze the use of music in this game. Finally, the paper will analyze and summarize the limitations and future development of digital music in games.

2. Basic descriptions of digital media

Digital music, a form of music created, edited, distributed, and played through digital technology, has become the dominant way of consuming and creating contemporary music [10]. The creation and development of digital music marks a major technological revolution in the field of music as compared to traditional analog methods of recording and playing music. This form of music utilizes

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digitized data to represent sound waveforms, allowing music to be copied, edited, shared, and stored in computer systems without loss of quality [11]. This shift has not only dramatically increased the accessibility and dissemination of music, but has also opened new possibilities for music creation, distribution, and consumption.

Digital music can be categorized in a variety of ways and can be divided according to different dimensions such as its creation tools, music styles, and uses. According to the classification of creation tools, digital music can be divided into electronic music, computer music and synthesized music. According to music style, digital music covers a wide range of popular music styles from classical to pop, rock, jazz, electronic dance music (EDM) etc. In terms of usage, digital music can be used in a variety of scenarios such as background music, movie and television soundtracks, advertising and promotion, and personal entertainment.

The wide and diverse range of major use scenarios of digital music reflects its universal application and important value in modern society. In the field of entertainment, digital music is one of the most popular contents on streaming media platforms, and platforms such as Spotify and Apple Music provide tens of thousands of music works for users to listen to or download online at any time. In movie and television production, digital music plays a key role in enhancing emotional expression and atmosphere creation as background music and theme songs. In addition, with the rapid development of the video game industry, digital music has also become an indispensable part of game design, which not only enhances the immersion and emotional experience of the game, but also serves as an important tool for game narrative.

3. Descriptions of the situations

With the advent of the 21st century, the role of digital music in games has become even more profound. In modern game design, music is no longer just a background element, but has become a key tool for enhancing immersion and augmenting storytelling. Through innovative techniques and approaches, game developers are able to utilize music to enhance the immersion, emotional depth, and narrative effects of their games.

Dynamic music systems are an important part of modern games. Dynamic music systems are capable of adapting music in real time based on player actions and in-game events [12]. It provides a more personalized and immersive experience for the player. For example, when a player enters a battle, the music may automatically shift to a more intense melody to match the current game context. In addition to this, virtual reality (VR) is also scenarios where music plays an important role. As shown in Fig. 1, in VR environments, the combined audio-video experience appears to provide the highest perceived presence [13]. The rise of music has also started to play an important role in this area. In these immersive environments, well-designed music and sound effects can greatly enhance the player's spatial perception and create a more realistic and engaging game world [14]. By simulating real-world sound environments or creating entirely new soundscapes, music and sound effects become a bridge for players to perceive the virtual world.

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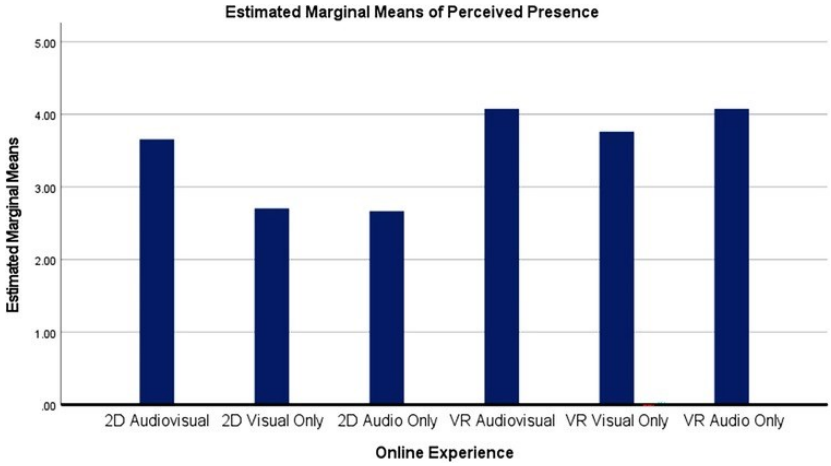

Figure 1: Music brings online perception to the audience in different environment [13].

Music occupies a crucial position in game narratives [15]. By closely integrating with the story and characters of a game, music can not only add emotional depth to the game, but also help players better understand and immerse themselves in the game's story. Music can be used as a narrative tool to foreshadow upcoming events, to reinforce the emotions of a particular episode, or to portray a particular atmosphere in the game world. The role of digital music in game design goes far beyond the traditional role of background music. From dynamic music systems to the use of music in VR to the close integration of music with game narratives, these advances not only demonstrate innovations in music technology, but also reflect the evolution of game experiences and narratives.

4. Realization

Journey is an adventure game developed by Thatgamecompany and released in 2012 [16]. It has received widespread acclaim for its unique visual style, simple gameplay mechanics, and deeply emotional experience. The dynamic music system used in this game plays an important role in enhancing the player's user experience. In this game, the player needs to complete his pilgrimage. Seen from Fig. 2, the mountaintop with the white light in the picture is the destination to complete the mission [17].

Figure 2: The diagram of Journey [16].

Music in Traveler connects the player to the game environment. The in-game music changes dynamically based on the player's location and interactions in the game world. As the player explores new areas or interacts with elements in the environment, the music changes accordingly, creating a fluid and organic musical experience which deepens the player's immersion in the game world. Then, music also forms a feedback mechanism for player behavior in the game. For example, when the

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player successfully solves a puzzle or reaches an important landmark, the music changes significantly to reinforce the player's sense of accomplishment. This timely musical feedback makes players feel that their actions are meaningful, thus increasing the appeal of the game [18]. In addition to this, the music of Traveler does not only reflect the physical environment of the game, but more importantly, the emotional arc of the game [19]. From the beginning of the lonely journey, to the chance encounters with other players, to the final climactic section, the music changes to closely follow the player's emotional experience, enhancing the emotional depth of the game's narrative. In Traveler, players may meet other players by chance. There are no traditional methods of communication in the game, and players interact with each other mainly through simple musical signals. When two players meet, they can "talk" to each other by making "gibberish" notes through simple button presses [20]. The game's music changes in response to this interaction, facilitating a non-verbal emotional exchange. Encounters between players in games are built on symbiosis and mimicry, where players are intoxicated by each other's presence [21]. This type of communication profoundly reflects the game's minimalist design philosophy - guiding players with minimal display content and fewer direct messages, aiming to remove any preconceived notions of encounters with other players, and ensuring that all players are on equal footing in the game [20]. This design touches the player's emotions at a deep level and becomes a source of the game's emotional power. Thus, the true significance of the presence of other players in the game lies in sharing the experience of the entire game journey together. By presenting the concept of mimicry, the game skillfully designs another player as a mirror-like presence, thus offering the possibility of a symbiotic relationship between players. This design allows the similarities (especially in appearance) between the players to go beyond superficial differences, focusing the players' attention on the common goal of the game and thus reinforcing their common will to follow the game's established path.

5. Limitations & outlooks

Although the usage of digital music in video games has greatly enriched the player's experience by providing an immersive gaming environment and enhancing emotional expression, it still faces a series of limitations in its practical application. First, technical limitations are an important factor. While modern game development technology has made great strides, it still requires large amounts of computational resources and data storage when dealing with high-quality music and complex sound effects. This can be an insurmountable challenge for small game development teams or projects with limited budgets. In addition, creating music content with depth and variety requires a high degree of creativity and specialized music production skills, which may limit game designers and developers who do not have sufficient music production experience.

Further, from a player's perspective, the subjectivity of music is an issue that cannot be ignored. Everyone's musical preferences are unique, and the same piece of music may be received and interpreted in different ways by different players [22]. As a result, in-game music may sometimes not achieve the desired effect, and in some cases, it may even interfere with or disrupt the player's gaming experience. Besides, overuse or inappropriate use of music and sound may lead to player fatigue or discomfort, especially during long game dialogues.

Finally, music, as part of human cultural identity, varies greatly across cultures [23]. With the globalization of the game market, the cultural sensitivity of music has become an issue that cannot be ignored. A piece of music that may be regarded as inspiring or enjoyable in one culture may carry a different emotional color or even negative impact in another cultural context. Therefore, game developers need to give more careful and thoughtful consideration to the selection and application of music to ensure that it conveys the emotion and message of the game cross-culturally.

Despite these challenges and limitations, the application of digital music in games still has a bright future. As technology continues to advance, future game music will be able to be more refined and

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personalized, providing players with a richer and deeper gaming experience. The development of artificial intelligence and machine learning technology, especially in the application of music composition and audio processing, predicts that the creation and realization of game music will become more automated and intelligent. This will not only reduce the cost and technical threshold of music production, but also create more diverse and dynamically changing music content to suit the needs and preferences of different players. In addition, with the popularization of virtual reality (VR) and augmented reality (AR) technologies, the role of music in gaming is set to change radically. In these immersive gaming environments, music is not only a background element, but also a key factor in creating a sense of reality and enhancing immersion. Through precise spatial audio localization and ambient sound simulation, music will be able to be more closely integrated with the game world and player interaction, creating an unprecedented gaming experience. Finally, with the deepening of globalization, the potential of music as a medium of cross-cultural communication in games will be further explored. Game music has the potential to become a global language that not only connects players around the world across cultural and geographical boundaries, but also promotes the understanding and appreciation of different cultural musical traditions. By deeply exploring the multicultural expression of music in games, future game design will be able to create more inclusive and diverse game worlds.

6. Conclusion

To sum up, the integration of digital music in video games has undoubtedly changed the face of game design and player experience. Through the strategic use of soundtracks, sound effects, and interactive audio elements, games are no longer just visual and gameplay experiences, but have evolved into game environments and narratives, as well as its potential to innovate game mechanics and foster player communities and shared cultural experiences.

The research significance of this paper lies in the comprehensive examination of how digital music contributes to the creation of immersive, emotionally resonant game environments and narratives. By placing particular emphasis on specific applications and technological advances in games such as Traveller, this study highlights the importance of sound in game design and the potential of music to deepen player engagement and emotional involvement. Additionally, a discussion of the current limitations and future perspectives of digital music in games provides a balanced view of the challenges and the way forward. As technology continues to evolve and new forms of player interaction emerge, the role of music in video games is expected to become even more critical, offering exciting possibilities for enhancing the user experience and pushing the boundaries of games in terms of narrative and emotional impact.

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