iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** V **Month of publication:** May 2025

DOI: https://doi.org/10.22214/ijraset.2025.71096

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue V May 2025- Available at www.ijraset.com

World Building: The Cultural Impact of Architecture in Video Games

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Abstract: ***Over the past 20 years, video games have evolved from rudimentary recreational activities into valuable resources of cultural exchange and recreation. As an interactive medium, they have evolved into complex multifaceted virtual worlds that primarily rely on visuals to establish an immersive and engaging experience for players. Our knowledge of the world we live in and the spatial elements around us allows us to interpret the symbolism and meaning of the elements in a virtual world, although sometimes subconsciously. Integrating familiar locations and historically accurate architectural elements can help build realistic environments and enhance the game's narrative. This research paper explores the symbiotic relationship between virtual architecture, real-world narratives, and storytelling within the context of video games. Qualitative methodology has been applied while exploring the links between video games and architecture. Thus, it is worth examining how this translates into the creation of game environments based on world regions and their cultures. The study is based in bibliographic research, in- depth analysis of case studies, and gameplay observations of a spectrum of games that include highly detailed recreation of historical locations, contemporary games set in today's environments, and fictional worlds that use familiar architectural elements to create new spaces and experiences. Culturally unique traditions and architecture specific to a region, when used without stereotyping in media, can help promote global understanding and reinforce cultural identity. Architects and historians can uniquely contribute towards the creation of videogames by building immersive environments and this paper elaborates on the transformative potential of architectural design elements in enriching the player's virtual experience.***
Hypothesis: The integration of architectural design elements in video games enhances player immersion and cultural understanding by using real-world narratives and storytelling within the virtual experience.
Method: Qualitative Analysis
Keywords: Video Games, Architecture, Historical architecture, Game Design, Genshin Impact.

I. LITERATURE REVIEW

Our perception of the virtual world is founded on our own experience and knowledge of existing places and design. Over the course of history and across the globe, distinct features have been associated with time and place. This includes traditions, literature, cuisine, music, and design. Video games primarily use visual aesthetics in their design which helps convey a narrative and root the storyline in a recognisable space. The most effective way of communicating an existing region is to combine different familiar elements in a way that presents a new idea. The model of creativity often associated with digital media is not that of originality and uniqueness but recombination and multiplicity (Jenkin) and this is a concept that is particularly useful for architects as different eras of historical architecture have iconic identifiable key components that are associated with the time period and place.

Video games, like most items of media, seek to transport the viewer to another place. While some choose to 'mirror our reality' (Indaverea) others attempt to create new worlds and anchor a game's plot in an authentic setting (Krzysztof Guzek, 2016). Games like Assassins Creed (Ubisoft) and GTA IV (Rockstar Games,2008) are set in renaissance Paris and New York's Times Square respectively and the in-game architecture references several key features of the place and time period which makes the experience more realistic. A painstakingly accurate replica of the Notre Dame Cathedral was created to ensure that game provided an authentic immersive experience. architectural character reflecting the economic and social status of its inhabitants. A detailed reconstruction of such a vast cityscape required many months of research based on existing historical archives, such as maps and other sources which provided information of how the city's layout evolved over the centuries. (Krzysztof Guzek, 2016)

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Although virtual architecture is not bound by the same laws of physics and bureaucracy that physical structures are limited by, they can still incorporate these elements to create a visual link. This can also allow architects to draw inspiration from the usage of fantastical and unconventional architecture and implement feasible alternative in their real-world projects, thus creating a symbiotic relationship, a permanent exchange between reality and conceptual ideas. When representing different regions with distinct features within a game, architecture, employing the usage of relevant colours, textures, and materials, can be the principal distinguishing element of the design.

Genshin Impact (Hoyoverse, 2020), an open world RPG set in a fictional world of seven nations, makes deliberate references to real world locations and draws from cultural legacy as a valuable resource (Krzysztof Guzek, 2016) So far, the game has distinct locations inspired by Germany, China, Japan, India, and France with each place showcasing vernacular architecture from its respective region. Representation, in the form of architecture and traditions, in a game with a sizeable global reach can help promote understanding between users from different regions and help instill cosmopolitanism (Zhu, 2022). Featuring traditional house construction methods to mimicking iconic grandiose monuments, the game creates a new environment with a familiar undertone. Our perception of the virtual world is founded on our own experience and knowledge, which allows us to read and interpret the meaning of the message conveyed. Architecture is just another tool that can help create a better experience for video game enthusiasts and promote better cultural understanding, The synergy of architectural design, narrative, and storytelling within video games has the ability to create more representation and create interest for potential new users. This research not only highlights the transformative potential of architecture in video games but also underscores the medium's capacity to bridge cultural divides, promote cross-cultural exploration, and cultivate empathy. As the gaming industry continues to innovate, recognizing the pivotal role of architectural design will be crucial in unlocking the full potential of video games as a platform for cultural enrichment and immersive storytelling.

II. THE EVOLUTION OF VIDEO GAME ARCHITECTURE

Electronic gaming, in its earliest form, was introduced in 1958 by physicist William Higginbotham when he created the first interactive video games, Tennis for Two. However, the 1970s is generally considered as the genesis of the video game era, with games like Pong and Computer Space experiencing massive success. During the 1970s, people would have to go to an arcade to play video games making it popular but not accessible to everyone. This all changed in the 1980s with the inception of the Home Console which would forever change the trajectory of video games as a form of entertainment. Companies like Nintendo brought the experience of an arcade to people ‘s homes with Home Consoles like the Nintendo Entertainment System in 1985. At the same time, due to the rising popularity of personal computers in every home, PC games started to gain popularity. The 1990s were marked by iconic 16-bit games that sparked franchises that are still immensely popular to this day. This era also featured the gradual transition from 2D to 3D graphics with consoles like the Sony PlayStation coming out in 1994.

The turn of the millennium cemented the role of video games in popular culture as it became extremely popular across the globe. This era also sparked the idea of mobile games, making it available to more people. Video games of today are far from the initial concept of creation, they have evolved over time and continue to play a significant role in the way we see games and our surroundings. The history of video games reflects not only technological advancements but also cultural shifts, influencing entertainment, storytelling, and social interaction on a global scale. The earliest video games were created with a set objective or task to complete, and the game took place in a particular space. Early on, the objective of the game was more important than the space in which it took place. This began to slowly change over the years with the development of better tools for higher graphics. But even the most basic game requires a location. When faced with a new experience, our sense of sight is most important in shaping our opinion about an experience. Today, video games are a diverse and expansive industry. Major gaming platforms include consoles (PlayStation, Xbox), PC gaming, and mobile gaming. Esports, virtual reality, and augmented reality continue to shape the gaming landscape. Games first started out with maps of a space to help navigate the game. With time this evolved into dub mini-maps, interior maps, and so on, shrinking in size and allowing for a greater deal of detail to be included. This is where architectural details included in the design can play a role in helping the players’ immersive experience. This is where architectural details included in the design can play a role in helping the players’ immersive experience. For this reason, game designers incorporate real world buildings into a game to ground the game in this reality and give it a backbone with which the game can unfold.

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A. *Genshin Impact: An Architectural Case Study*

Genshin Impact, a widely popular open world RPG, is an example of a game whose architecture draws inspiration directly from the real world while still including fantasy elements inspired by historical architecture. Each region in the world of Teyvat, the game's universe, and each unit is inspired by a different culture. Our perception of the virtual world is founded on our own experience and knowledge, which allows us to read and interpret the meaning of the message conveyed. The game uses our existing cultural connotations or symbolics associated with a particular location to create a sense of belonging to a place. The study explores the intricate architectural design and environmental storytelling within the game, examining how the digital realm of Teyvat reflects cultural influences, architectural styles, and narrative elements. Through a detailed case study, this research aims to uncover the artistic and cultural significance embedded in the virtual architecture of Genshin Impact.

B. *Mondstadt: Germany and Gothic architecture*

The first region to be released in game was Mondstadt, a region that closely resembles Germany and Switzerland. It boasts of quaint towns and villages with houses built in a half- timbered style as was the case in resembles Germany's Rhineland-Palatinate state. Half- timebered houses have always been associated with Germany and these also feature tiled roofs. The Rhineland's landscape is lush and green, rolling hills take turns with high and steep cliffs. The steepest vineyards in the world are to be found there. Like Mondstadt, the Rhineland's landscape is dotted with the ruins of an ancient civilization, that of the Romans. There are windmills and turrets scattered in-between made of stone and wood, but the architectural masterpiece of Mondstadt is the Favonius Cathedral. Inspired by magnificent gothic churches and cathedrals of the past, the Favonius Cathedral stands at the highes point in the city of Mondstadt, with a view of the city below. With thick walls and large windows to let in light, the buildings are accurate recreations of a combination of various gothic cathedrals of Germany and Switzerland while still being completely original. Architectural details like flying buttresses, arches, rose windows, and stained glass all help identify the region, time period, and inspiration behind Mondstadt. This gives the player a preconceive idea of what to expect from this region and it delivers

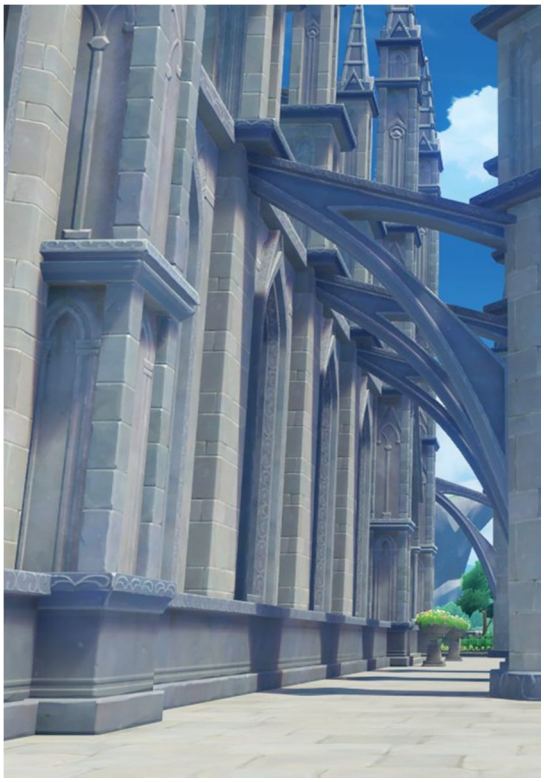


Fig 2: Flying Buttresses at the Cathedral (source: author)



Fig 1: Mondstadt's half-timbered houses (source: author)

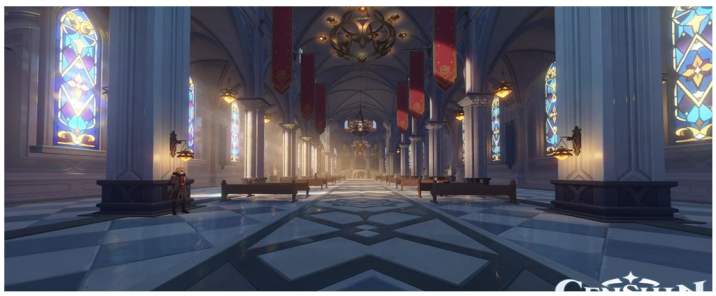


Fig 3 : Gothic inspired Favonius Cathedral interiors (source: Genshin Impact Official)

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C. *Liyue: Traditional Chinese architecture*

Liyue, the second region to be released is heavily inspired by medieval China. With a rich amber colour palette and cliff-like terrain, Liyue has architecture that represents China at the time. Liyue harbour is similar to many harbours in China, all being economic centers of the nation. Looking at a a particular location named Yujing Terrace we see the similarities between it and real life 'Terraces' from China which refers to a flat surface that is elevated from the ground, where important buildings are often constructed. The buildings here, like the The Hall of Supreme Harmony, play a significant role in society and are elevated to show importance. In the game, only the office building of Liyue Qixing and the mansions of high- ranking officials, such as Gentry Maocai, are built on Yujing Terrace.

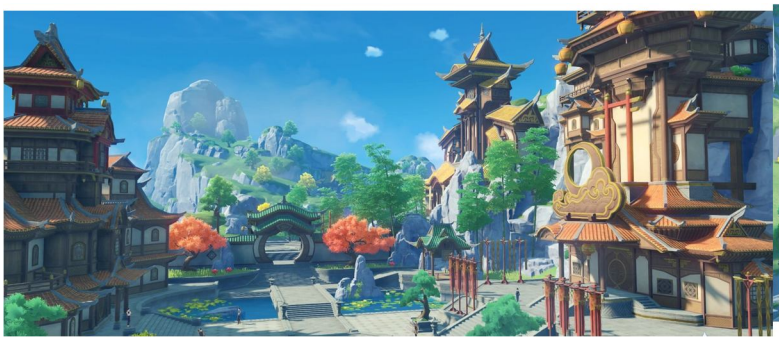


Fig 4 : Yujing Terrace
(source: Genshin Impact Official)

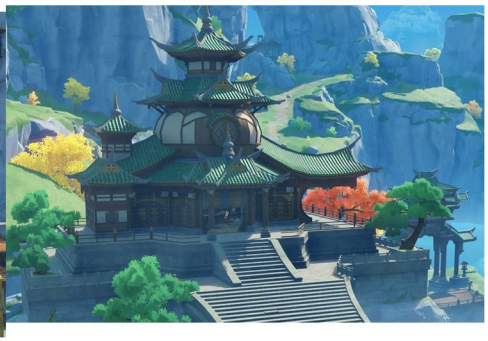


Fig 5 : The Pharmacy
(source: Genshin Impact official)

The feature that stands out the most in Liyue is the different types of roofs that are found in most East-Asian designs. China's ancient architecture has a rich variety of roof styles, with many variations, including gabbled style, suspension style, saddle style, paraboloid style, pointed style, and hipped style. There are also some more unique roofs such as cross-ridge roofs, helm roofs, truncated roofs, and fan-shaped roofs. In addition to its functional role, the roof of ancient buildings is also a symbol of rank. Since Mihoyo is a Chinese based video game developing company, the representation of Chinese architecture will be as accurate as possible. This reinforces the need to employ architects and environmental designers that are familiar with the styles of the region they are building, to ensure accurate representation.





Fig 6 : Traditonal Chinese hip roofs (source: author) Fig 7 : Yujing Terrace (source: author)

D. *Sumeru: Blending South Asia and the Middle East*

Out of all the regions in Teyvat, Sumeru is the hardest to pinpoint in terms of existing cultures as it draws inspiration from the most number of sources, with rainforests and deserts featuring architecture from India and Persia in the bazaars of Sumeru City and the desert Mausoleums representing the iconic grandeur of Egyptian architecture. However, care has been taken to match the building styles with the climatic conditions of its source country, another feature that can be considered when designing a new world.




Fig 8 : Lotus shaped motifs (source: Genshin Impact Official) Fig 9 : Islamic inspired Akademiya in Sumeru (source: author)

Described as a region home to the largest research and academic institutions, Sumeru has plenty of large institutional and administrative buildings such as the Sumeru Akademiya in Port Ormos. The main architecture draws inspiration from Islamic culture, as it is reminiscent of mosques , as seen in the Lighthouse of Alexandria . Designs often feature high central domes that tower over the surrounding area. Symmetry, a design principle often associated with Islamic architecture can be clearly seen in the radial symmetry of most buildings in Sumeru. The domes are often surrounded or flanked by intricately carved minarets juxtaposing the heavy round dome with tall, slender profiles. The minaret, also known as the light tower or evening prayer tower, is a common feature of mosques used to call the faithful to prayer. In the game, the minarets are lowered in height, making it more about the aesthetic than the function.

An element that pops up repeatedly is the lotus. The rooftops of some buildings in Sumeru City include a lotus-shaped top and the dome-like top in some Indian temples. However, real-life temple domes and lotus domes are more subdued, while the petal-shaped roofs in Sumeru are somewhat exaggerated to play into the element of fantasy and imagination.




Fig 10 : Egyptian inspired Mausoleum (source: Genshin Impact Official) Fig 11 : Inspired by Egyptian Temples (source: Genshin Impact Official)

The desert regions of Sumeru are clearly inspired by the desert architecture of the pyramids of Egypt. They are instantly recognisable by most people, making it an obvious choice for a game trying to replicate real life architectural marvels. The Egyptian pyramids are said to be the tombs of ancient Egyptian pharaohs.

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Pyramids were mainly popular during the Ancient Kingdom of Egypt, about 4600 years ago. The base of the tomb is square, with four equal triangles (a square pyramid) on each side. The Egyptian pyramids are one of the largest groups of buildings to this day, and are one of the most influential and enduring symbols of ancient Egyptian civilization. Most of the pyramids were built during the Ancient and Middle Kingdoms of Egypt. The game also uses obelisks as landmarks for teleportation devices, obelisks being tall structures synonymous with ancient Egyptian architecture.

Like the usage of roofs in Liyue, the game developers also use the unique nature of south-east Asian roofs to link their buildings to a culture. This is the layered roof that is commonly seen in Sumeru architecture. The style and design of these buildings do not belong to Islamic or Indian culture, but are more commonly found in countries in Southeast Asia such as Myanmar, Thailand, and Cambodia. This style of architecture is called Jom-Hae in Thailand, and similar elements can be seen in other countries in the region such as Myanmar and Cambodia. The characteristic feature is the layered, cascading roofs, with each layer getting progressively larger or smaller. In Sumeru, this style of layered roofs can be frequently seen in residential buildings of which the roofs are made with similar layered, cascading profile. Instead of single-layer roofs, layered roofs are designed to resemble folded banana leaves. an abundantly available material in South Asia, making its shape closer to the leaves of the plant, which also echoes the theme of Sumeru, the Nation of Dendro.

III. FINDINGS FROM SURVEY

In order to investigate and better understand the basic relationship between Architecture and Video games, a survey was conducted for 90 participants to grasp their understanding of what architecture in video games means to them. The questionnaire is aimed towards participants with basic knowledge in both fields to verify how evident the link between architecture and video games is for individuals with an architecture background along with at least basic exposure to video games. 67.2 % of the participants have been playing video games for over 5 years, making them well aware of the evolution of games over time. From the survey, it was gathered that out of the 90 participants, the most popular games seemed to be RPGs (Role Playing Games), and action adventure games with over 52% choosing these genres as the at least one of the types that they are most familiar with. This is an interesting hint that shows how open world maps games, in which architectural environments tend to be the most developed, are starting to attract more audiences.

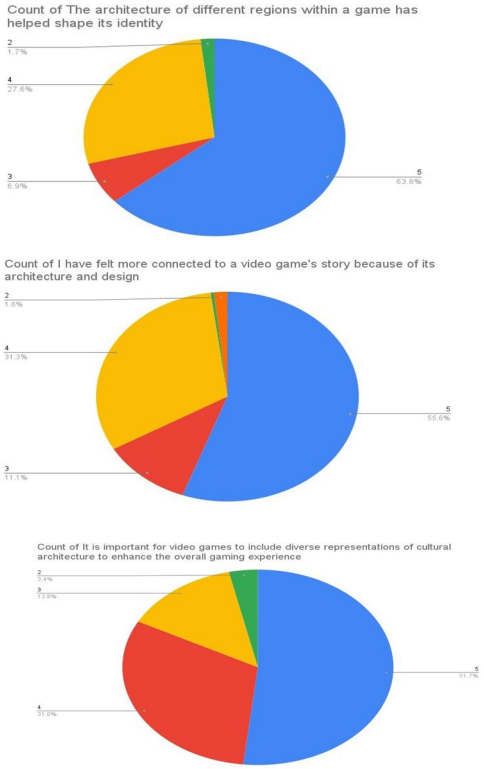


Fig 12 . 1 , 1 . 2 , and 12 . 3 :
Survey Data
(source: author)

The participants of the survey are on the younger side with 75.3% being within the age of 18-24, participants from this category are already aware of the design elements associated with aa culture. Further proof of this statement is 68.3% of them strongly agreeing that the different regions within a game have helped shape its identity. The majority of participants also felt more connected to a game's story because of its architecture and design with 55.6% strongly agreeing with the statement. The participants of the survey are on the younger side with 75.3% being within the age of 18-24, participants from this category are already aware of the design elements associated with aa culture. Further proof of this statement is 68.3% of them strongly agreeing that the different regions within a game have helped shape its identity. The majority of participants also felt more connected to a game's story because of its architecture and design with 55.6% strongly agreeing with the statement. The elements that enhanced the experience the most were architectural details, building design, and shapes/colours in that order.

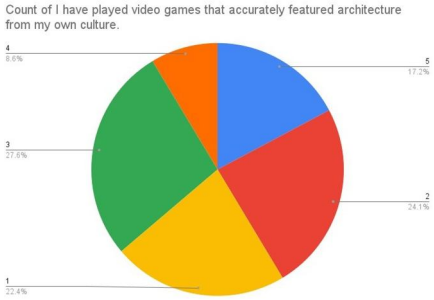


Fig 12 . 4 :
Survey Data
(source: author)

A staggering majority of 82.3% felt that video games should developers and designers should include diverse representations of different architectural styles and cultures to enhance the overall gaming experience. This shows that there is a demand for Participants from countries in the west agreed that they have played games that accurately featured their culture, but almost all the Indian participants disagreed or strongly disagreed with the statement (49% of the group in disagreement)
Participants shared their personal experiences with video games and how architecture has shaped their experience. The majority agreed that it is crucial to consider the designs of the buildings and environments in order to make the game more engaging and immersive.

A. Quotes from the Survey Include

"It's a part of the environment. It's hard to tell a story when it doesn't have a place for itself. It can signify a presence or absence of a civilization when used right. Sometimes even how presence of one destroys what was already here. Also it's a difference between full immersion and continuously getting stuck on fences and doorframes"

"Architecture and representing accurate architectural styles and design features are definitely key to building immersion as well as complimenting the energy, setting and tone of the story and game in general."

"It gives the game an identity. It's not just a game in a random environment, it's THIS environment."

"From a gameplay perspective, architecture, building layout, and terrain can sometimes make or break how strategy and mechanics are implemented in practical gameplay. From a storytelling perspective, the design and architecture can give worldbuilding clues, create emotional connections to locations and the events that occur within (making the potential return to those places more impactful and memorable), and create a sense of scale and mood when the situation demands it."

"Great architecture adds to the story. Good architecture explains about the culture of the in game folks while also being functional. "

The Impact of Cultural Representation in Video Games

Having explored the significance that video games hold in terms of media in today's world, it is crucial that we understand the impact it can have on young minds that are being shaped with ideas of different cultures. Representation, in the form of architecture and traditions, in a game with a sizeable global reach can help promote understanding between users from different regions and help instill cosmopolitanism (Zhu, 2022). Our perception of the virtual world is founded on our own experience and knowledge, which allows us to read and interpret the meaning of the message conveyed. Architecture is just another tool that can help create a better experience for video game enthusiasts and promote better cultural understanding.

Countries like India, Cambodia, and Iran are not the first places you think of when asked to picture a video game setting because historically they have been left out of the conversation. Continuing to use the example of Genshin Impact. The game has been praised for its attention to detail and representing different cultures. Even with a game on a global scale there is a skewed representation of countries that are often left out of video game pop culture. Although the designers of the game have dedicated two separate region for Chinese and Japanese inspired designs, choosing to depict Sumeru as a complex amalgamation of different cultures is not a good example of accurate representation. Trying to reference different cultures within a region can make the design feel rushed and incomplete.

Using cultures in a way that stereotypes them or reduces them down to a singular understanding of them can be harmful and have negative impacts when done poorly. Media has often reduced Eastern cultures to caricature of the culture. Even with games developed in the east, representation of forgotten cultures has a long way to go. This is why it is crucial to involve architects and historians from a particular culture when making a game, or any piece of media, so that careful thought is put into the way in which it is represented and how it ight translate to a global audience. Sensitivity and cultural competence are crucial in avoiding stereotypes and misappropriation. Game developers bear the responsibility of conducting thorough research, consulting cultural experts, and ensuring that their representations are respectful and authentic

IV. CONCLUSION

Video games have become a global phenomenon, transcending borders and connecting players from diverse cultures. Games that incorporate elements from different cultures facilitate a global dialogue, fostering mutual understanding and appreciation. The exchange of cultural narratives within the gaming community promotes a shared language of creativity and expression that transcends geographical boundaries. how it ight translate to a global audience.

Video games have evolved beyond mere entertainment; they are now immersive storytelling mediums. The authentic representation of cultures within games enhances player immersion, allowing individuals to explore and appreciate the richness of diverse worlds. From architecture and language to folklore and traditions, culturally accurate depictions contribute to a more authentic and engaging gaming experience.

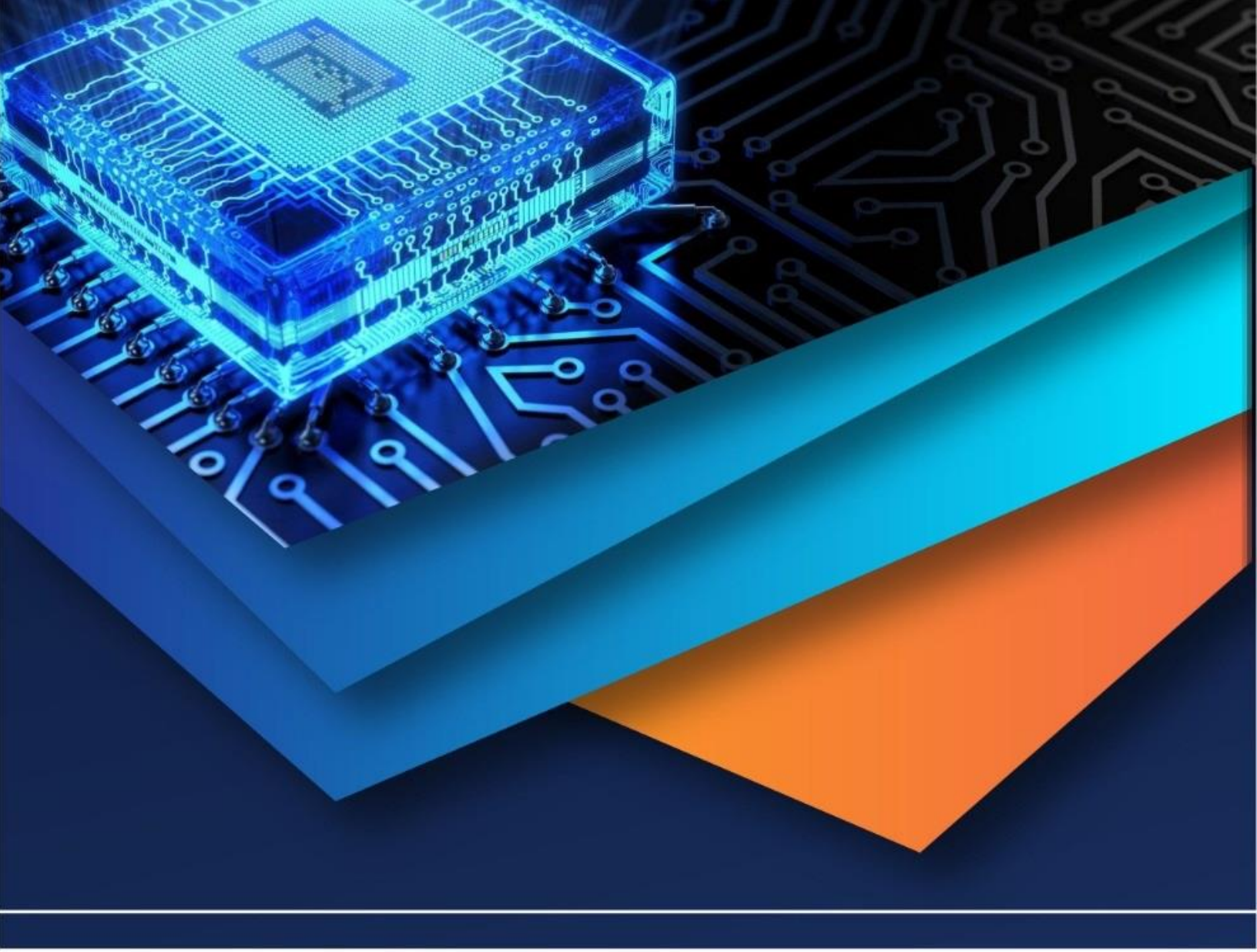
Video games have the power to shape perspectives, foster empathy, and contribute to a more inclusive and globally connected gaming community. As the gaming industry continues to evolve, recognizing the importance of authentic and respectful cultural representation becomes not just a creative choice but a social responsibility

The integration of architectural design elements in video games enhances player immersion and cultural understanding by using real-world narratives and storytelling within the virtual experience.

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