World Journal of Innovation and Modern Technology, Vol. 6, Issue 5, (Oct) 2023
ISSN 2682-5910
DOI: 10.53469/wjimt.2023.06(05).02

Research on the Conservation Rehabilitation Design of Old Commercial Building Complexes under Digital Interactive Technology

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Abstract: ***With the development of the times and the progress of science and technology, traditional intangible cultural heritage is in danger of being lost, so the protection and inheritance of traditional culture is particularly important. This design project is located at Huazhong University of Science and Technology (HUST), which is an old campus commercial complex building renovation design. The interior of the building is simple, with a low lighting rate and low space utilisation. The building road is aging, the site planning is underutilised, and the infrastructure is not perfect. The houses are old, and the story height is not the same. The design aims to combine traditional nonheritage culture with modern technology, integrate space and theme, achieve organic unity of form and function, and fully reflect the visual effects of technology and the future through interactive technology and immersive experience. Presented to people in a novel way, people can still feel the charm of traditional culture in modern life. At the same time, the design of the commercial complex also takes into account the needs and consumption habits of modern people, creating a place that integrates a variety of experiences. Through the mutual integration of scientific and technological means and cultural creativity, the design of the commercial complex basically achieves the design goal of cultural heritage, commercial operation and scientific and technological innovation.***

Keywords: Renovation of old buildings; Campus commercial complex; Immersive experience; Nonheritage culture.

1. INTRODUCTION

Figure 1: Typical Commercial Complexes in Overseas Countries (Source: Web Image)

Urban space is a cut-out and container that maps the social and cultural values of human society, which is both a figurative physical field and a generator of people's feelings [1]. This graduation design covers a variety of directions, such as themed public space, commercial space, exhibition space, etc., involving multiple levels and fields, aiming to promote the communication and cooperation of interior design majors in universities across the country, as well as to improve the practical ability and comprehensive quality of interior design students. The design industry has paid extensive attention to and recognised this event, and it has become one of the important brand activities in the field of domestic interior design [2]. A commercial complex is a combination of three or more functions of urban living space, such as catering, entertainment, conference, exhibition, performance, office, hotel, residence and transport facilities, with commercial shopping as the main focus, forming a multifunctional,

high-efficiency, complex and unified integrated building [3]. With the continuous improvement of urban development and people's consumption demand, commercial complexes, as one of the key projects of commercial and urban development, have received widespread attention and investment, as shown in Figure 1. A commercial complex is a very design-oriented building that is the embodiment of city image and real social life [4].

China's research on urban commercial layout was concentrated after 1990, and domestic experts and scholars in foreign research have focused on the influence of new technologies on the influencing factors and occurrence mechanism of urban commercial layout research [5]. The commercial complex positioning mode is an important aspect of the construction of commercial complexes and is closely related to the commercial strategy of commercial complexes. Existing studies have explored the modes and strategies of commercial complexes in terms of brand positioning, target customer positioning, and operation methods to meet the consumption needs of different cities and populations. The space layout and design of commercial complexes is an important link in the construction of commercial complexes, which is directly related to the commercial benefits and pedestrian flow of commercial complexes. Existing studies have explored the impact of the spatial layout and design of commercial complexes on the commercial benefits, passenger flow, brand image and other aspects of commercial complexes [6].

2. TRENDS IN COMMERCIAL COMPLEXES

As an important commercial building form in cities, the construction of commercial complexes has a certain impact on the city's environment. Existing studies have explored the environmental impacts of commercial complexes, the impacts of supporting public facilities such as urban transport and water and power supply, and green building and energy-saving measures for commercial complexes.

2.1 Development status of commercial complexes

In the 1930s, foreign scholars began the study of commercial layout. The United States and Japan are the ones that started faster and researched more on the architectural design of commercial complexes. In terms of the design and space layout of commercial complexes, foreign studies have mainly explored the architectural style and external image design of commercial complexes, as well as the indoor space layout, shop settings, energy use and environmental protection. Among them, energy use and environmental protection have been discussed. Among them, research on the energy utilisation and environmental protection of commercial complexes is more active, and a number of studies have explored the application and effect of green building technology in commercial complexes. Studies on the socioeconomic impact of commercial complexes in foreign countries are mainly concerned with the impact of commercial complexes on consumers and urban society. Studies have shown that the construction and operation of commercial complexes can improve the economic level of cities, increase employment opportunities, and improve the consumer environment for consumers [7]. Foreign research focuses on the brand strategy and consumer loyalty of commercial complexes, which has important guiding significance for establishing commercial brands and promoting the development of commercial complexes. The commercial complex brand strategy mainly includes brand positioning, brand communication, brand governance, brand image and brand loyalty [8]. Commercial complexes are urban commercial landmark buildings, and with the development of society and the market, the development of commercial complexes is constantly changing and upgrading. Many cutting-edge digital technologies have existed for a long time, but their value has not been fully developed [5]. Digitalisation, intelligence and informationisation are the future development directions of commercial complexes. Extended reality technology is mainly through the integration and fusion of a variety of visual interaction technologies, generating a visualised environment with both reality and reality and providing immersive experiences and feelings for the experiencers. Commercial complexes will enhance customer experience, create a more comfortable consumption environment, and achieve more efficient operation and management through digital technology, intelligent equipment and information technology [9]. Commercial complexes will not only be places of transaction and consumption but will also become centres of culture, entertainment and social interaction. In the future, commercial complexes will draw closer to consumers through richer cultural connotations and diversified experiential activities to enhance brand influence and consumer loyalty.

In addition, the commercial complex will become a place for social interaction, guiding consumers to explore, communicate and share experiences and promoting the integration of socialisation and commercialisation. From offline themed touring exhibitions in shopping malls to immersive entertainment performances, as well as immersive themed neighbourhoods and experiential field spaces, the model of "immersive + physical business" allows users to experience sensory shock and thinking identity because of more diverse scenes and more composite

business forms (Tan Xueming, 2022). Commercial complexes will stimulate consumer demand and interest in an innovative way, establish social networks and platforms, and promote multifaceted cooperation and development [10].

2.2 Development objectives of commercial complexes

Overall, future commercial complexes will pay more attention to enhancing consumer experience, strengthening commercial attributes, enhancing social and cultural atmosphere, and promoting the development of digitisation, intelligence and information technology to achieve comprehensive upgrading and innovation of commercial complexes.

With the continuous development of society and the economy, people's spiritual needs are constantly changing, and the change and development of commercial complexes will continue to pose new problems and challenges. Commercial complexes with immersive themes are facing a fast pace of technological development. To maintain the competitiveness of commercial complexes, commercial complexes need to constantly innovate and upgrade according to the needs of consumers, as well as constantly update and upgrade the existing technological equipment and software systems, pay more attention to digital marketing, and conduct publicity and marketing through social media, mobile Internet and other new media methods. Break the boundaries of traditional concepts and innovate marketing strategies.

Issues to think about and address for the programme:

1) Rational planning of space as well as functional zoning to improve space utilisation;

2) Create an immersive experience through sci-fi elements and integrate nonheritage cultural elements into the design [11];

3) Ensure sustainability and innovation in the operation of commercial complexes;

4) Increase brand awareness and create market linkage between on-campus and off-campus.

3. REDESIGN OF OLD COMMERCIAL BUILDINGS COMPLEX—TAKING HUAZHONG UNIVERSITY OFSCIENCE AND TCHNOLOGY COMMERCIAL BUILDINGS AS AN EXAMPLE

The address of the project is Huazhong University of Science and Technology (HUST), located at 1037 Luoyu Road, Hongshan District, Wuhan City, Hubei Province, China, with a total area of more than 7,000 acres, which is a comprehensive research university covering the disciplines of engineering, science, management, literature, medicine, law and education. Backed by Yujia Mountain and Yujia Lake, the East Campus is adjacent to Maanshan Forest Park, with beautiful scenery and environment. The main campus is close to Guanggu Pedestrian Street and shopping centres. The surrounding environment of the project is very lively, adjacent to student dormitory buildings and canteens, and close to areas such as the central playground and teaching buildings. However, due to the aging of the East 3 and East 4 canteens and their "half-closed, half-operational" status, the area is not vibrant and attractive enough to meet the needs of students' daily lives. Only a small part of the East 3 building is used as a halal canteen, and the rest of the area is not effectively used; the student service centre in the East 4 building is too simple and lacks recreational and leisure facilities, which makes it impossible for students and teachers to enjoy a space to relax. Therefore, this area is in urgent need of a vibrant and colourful place where teachers and students can better enjoy their lives and make the campus culture prosperous.

3.1 Analysis of the current status of the project

As a prestigious university with a history of seventy-one years, Huazhong University of Science and Technology (HUST) faces problems such as aging infrastructure and a backwards living environment. The interior of the buildings is simple, with low lighting rates and poor space utilisation; the building roads are ageing, the site planning and utilisation are inadequate, and the infrastructure is not yet complete; the houses are old and have different floor heights.

In recent years, "Post-95" and "Post-00" have gradually become the main force of consumption, and these groups are generally more open and diversified, highly receptive to new things and have obvious characteristics of stratification [12]. These aging problems are becoming increasingly prominent with the rapid development of modern society, the continuous progress of science and technology, and the increasing popularity of intelligent public environments. To better understand and address these issues, we conducted site visits and research. Through online questionnaires and offline interviews, we reached a series of conclusions.

The primary population in this area consists of current students, faculty, staff, and off-campus visitors. The main activity hours for these activity groups are from 8 a.m. to 9 p.m., with the heaviest traffic periods being from 11.30 a.m. to 1.30 p.m. and from 4.30 p.m. to 8 p.m. Students predominate in all activity groups. From the students' point of view, they have an urgent need for a "campus CBD", hoping to obtain a commercial complex that meets their needs in many aspects, such as daily life services, leisure and entertainment, cultural exchanges and innovation and entrepreneurship [13]. In addition, students also said that the commercial complex needs to have a campus cultural atmosphere and, at the same time, reflect the sense of science and technology and the sense of a new wave. The consumption pattern should fully integrate modern and intelligent elements.
SWOT analysis of the vicinity of the project site:

1) Advantages: the site is located within the Huaxue campus, surrounded on all sides by the main street and adjacent to the student dormitories, and recreational areas are densely populated; the surrounding ecology is good, and the scenery is beautiful.

2) Weaknesses: poor commercial infrastructure; no character, single function, too many abandoned areas and lack of management; too few previous businesses on the site to meet student demand.

3) Opportunities: enormous potential source market; strong school support for campus business; continuous improvement of basic facilities in the neighbourhood.; development of immersive and social business complexes.

4) Challenges: Collision between commercialism and humanism; facing the potential threat of homogenisation. Loss of its own resource advantages and core competitiveness.

3.2 Project Design Programme and Positioning

Under the physical field of traditional heritage combined with modern atmosphere, culture plays the role of memory carrier of human society. As one of the important railway transport hubs in China, Wuhan not only has modern railway yards and facilities but also nurtures a rich and colourful railway culture. The Wuhan Guangzhou Railway, referred to as the Wuhan-Guangzhou Railway, is China's first nationally invested railway line, running through Hubei, Hunan and Guangdong, and is an important corridor for China's north–south railway traffic. The historical and construction background of the Wuhan-Guangzhou Railway shows the process and achievement of modern railway construction in China. Another important part of Wuhan railway culture is locomotive culture. In the former railway era, locomotives were important equipment for railway transport, with special technical and cultural connotations. The Wuhan Railway Bureau has a number of locomotive dispatching stations and maintenance factories to protect and inherit this rare railway cultural heritage. Wuhan railway culture has a deep historical heritage and important practical significance, expressing the struggle and achievement of the construction and development of China's railway, as well as showing the unique charm and value of the Wuhan area in the field of railway culture.

Wuhan is also known as the "City of a Thousand Lakes" because of its large number of lakes. These lakes have greatly influenced Wuhan's urban form, cultural heritage, tourism development and other aspects and have become an important cultural element of Wuhan, which will be extracted from the lakes and rivers and added to the space in this design. In view of this, linking Wuhan's railway elements with future technology and extracting and inheriting the elements and essence of Wuhan's railway culture is an important step in the design of a commercial complex combining immersive interstellar travelling meta-universe themes and nonheritage culture and is also one of the ways to let people better understand and feel Wuhan's railway culture [13]. The theme of this design is called the Lightyear Platform, which raises the railway culture and train elements of Wuhan to the height of the future through science fiction.

The design intends to divide the two buildings, East 3rd and East 4th floors, into four themed spaces, namely, the Mechanical Planet and the Hive Planet on the East 3rd floor and the Prismatic Planet and the Levitating Planet on

the East 4th floor. This creates an interstellar travel-themed meta-universe and nongenetic commercial complex. In this designed commercial complex, we will tap into the Wuhan railway culture and lake elements and combine these elements with future technology to create unique experiences and interactions that will allow experiencers to feel the travelling through time and space [14]. Additionally, we will focus on creating a strong nonheritage cultural atmosphere, combining regional characteristics and cultural heritage to create a unique nonheritage cultural experience so that people can feel the collision and fusion of traditional culture and modern technology. Integrating commerce, art and culture intrinsically, this ingenious concept is exactly where the hope of the ecological reconstruction of commercial property lies at present, and it is also a kind of commercial aesthetics adapted to the requirements of the times [15]. The ultimate goal of this design is to perfectly combine the space and the theme, to achieve organic unity of form and function and to fully demonstrate the visual effect presented by technology and future elements through interactive technology and immersive experience.

4. PROJECT DESIGN PERFORMANCE AND REFLECTION

To cater to the needs of different groups of people, commercial complexes should create a variety of different themed spaces and incorporate a diverse range of functions and businesses. We integrated the originally closed and narrow interior space to create four different intergalactic themed spaces: mechanical, hive, levitation and prism. These themed spaces will provide guests with a variety of different functions, such as entertainment, socialising, living services, cultural exhibitions and learning and innovation, to meet the needs of different groups of people, and the overall planning area is divided as shown in Figure 2.

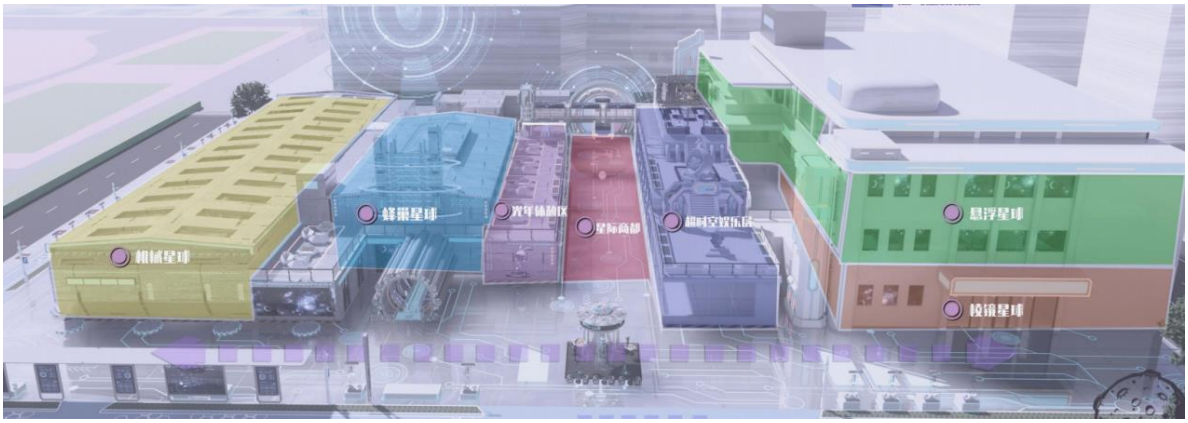

Figure 2: Overall regional division of the project programme

4.1 IP image creation and value concept

When thinking about the IP image, it was decided to combine elements of traditional Chinese culture and modern technology to create an image that is both dynamic and futuristic. Our IP prototype is a white rabbit, lively and witty, inspired by the traditional Chinese mythological story - Chang'e Runs to the Moon, representing the beautiful vision of mankind from landing on the moon to interstellar travel. While inheriting the image of the rabbit in traditional Chinese culture, it embodies modern technology and futuristic sense.

4.2 Design of building exterior restoration

The study of the external spatial visual environment of commercial complexes is a study of human behaviour in the spatial environment and the relationship between humans and the spatial environment [16],[17]. The design is based on the concept of combining technology and nonheritage and introduces natural elements and symbolic elements of the original building into the design, creating a building that combines futuristic and historical memory [18]. The exterior of the building has been reconstructed using simple blocks, and the east fourth floor adopts the design elements of modern architecture, with simple treatment of lines and geometries and rounded curved corners to make the monolithic building look more fluid.

With the continuous development of urbanisation and the continuous improvement of people's living standards, single road lighting cannot fully meet people's current spiritual needs [19]. To add a sense of technology, the building facade is designed with façade line lighting through the use of aluminium-plated sheet material and high-

efficiency light sources such as LEDs, creating a dynamic and colourful façade form and highlighting its sense of fashion and vitality. The dark grey colour of the exterior of the third floor of the east building and its angular lines accentuate the technological sense of the future station base. The discontinuous light strip embellishment on the façade also adds to its highlight. On the premise of retaining the representative elements of the original building and the nondetachable fixtures, we have cleverly incorporated them into the design. For example, the original nondetachable gas equipment was transformed into the Huako Lightyear Train that runs through the theme, injecting more creativity and vitality into the commercial complex. The transformation and use of these elements and devices preserves history and culture while adding a sense of the future and technology.

4.3 Regional movement lines and functional nodes

In the landscape renovation of the project, a total of fourteen small landscape nodes were designed with different themes and elements. These small nodes are connected through the space-time corridor and space-time walking track, creating a sense of travelling through time and space. When night falls, these nodes will be illuminated, presenting diverse light and shadow effects, adding a mysterious atmosphere to the Lightyear Station, as shown in Figure 3.

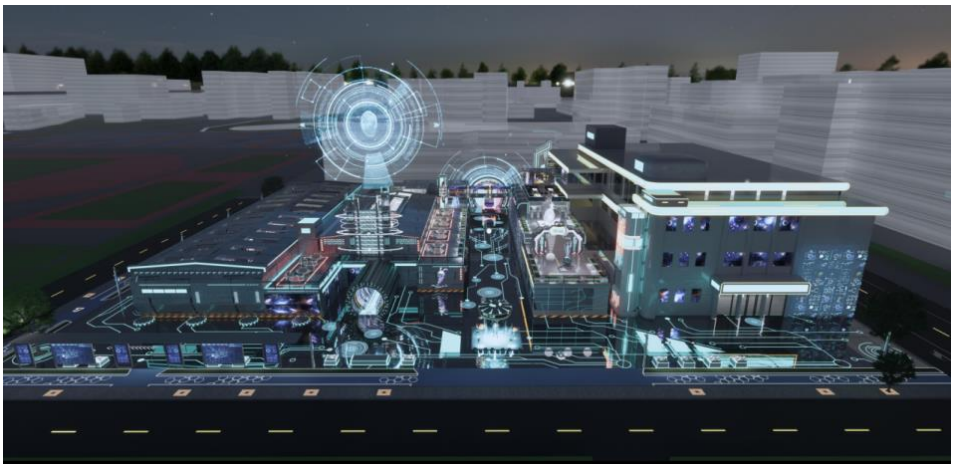

Figure 3: Aerial night view of the overall appearance of the project

(1) 2077 Huako Explorer: The Huako Explorer is the main installation in the commercial complex that serves as a symbolic vehicle for the space-time corridor. The holographic projection technology allows the Huake Explorer Lightyear Train to appear from the wall, presenting a grand and spectacular effect. The digital information carried by the Lightyear Train and various data of the commercial complex can be directly presented through the projection of the Lightyear Train, enabling customers to easily understand the information and promotional activities of the commercial complex. In addition, the renovation of the nonremovable gas fittings on the back wall of the Lightyear Train gives this landscape node a special historical significance and further strengthens the cultural heritage of the commercial complex.

Figure 4: Effective diagram of the project's intelligent streetlights and time-walking runway

(2) Time-walking runway: it creates a convenient fitness environment for users. This not only increases the attractiveness and social responsibility of the commercial complex but also meets young people's needs and lifestyles for a healthy life, demonstrating the commercial complex's youthfulness and sense of technology. Adopting the implementation of an intelligent runway, it can automatically record exercise data, recommend exercise plans, provide online fitness coaches and other functions, providing users with a more convenient and interesting exercise experience, as shown in Figure 4.

4.4 Interior design of commercial building complexes

By analysing and integrating the interior space of the commercial complex, we redesigned and integrated the original narrow and fragmented space without affecting the original column network structure. We divided the interior space into four thematic spaces: mechanical planets, honeycomb planets, levitating planets and prismatic planets. With the integration of different businesses in mind, they were each integrated into specific themed spaces to create a new experience that is more coherent and interactive.

(1) Mechanical Planet: Located on the south side of the east third of the commercial complex, Mechanical Planet uses greenish-orange tones and the design of the capsule deck to create an atmosphere of cutting-edge technology and space travel. In addition, in the overall space, the expression of future technology has been used to design four nodes of space lift, capsule deck, mechanical goddess and interstellar portal to echo the theme of space.

Element Extraction: The element design of this theme space integrates two elements of the past industrial era and future technology, represented by the gears of the old-fashioned train and the capsule. The gears are made of iron and brass materials after grinding and polishing, showing a sense of vicissitude and texture, which is skilfully applied to the design of mechanical devices. The capsule, on the other hand, is mainly a streamlined capsule, using metal mouth materials, transparent materials and light and shadow technology to bring a sense of futuristic and technological visual impact, as shown in Figure 5.

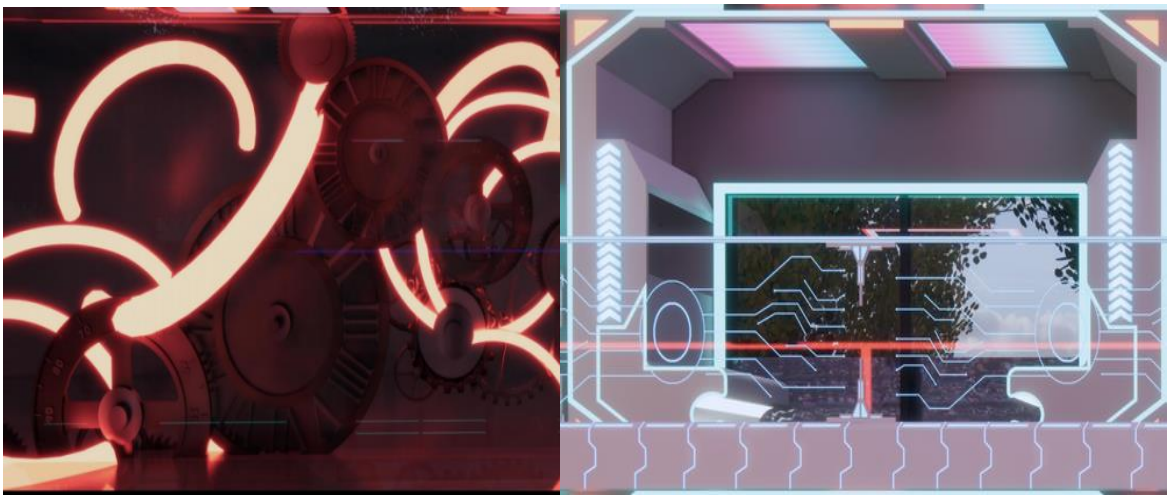

Figure 5: Project Gear and Capsule Elements

(2) Beehive Planet: The Beehive Planet themed space located on the north side of East 3 is inspired by the honeycomb, using its unique structural features and spatial organisation to form a diverse space for leisure, socialising and small-scale retail. The space is embedded with an enormous skylight, through which sunlight shines on the Beehive Island area, creating a natural and cosy atmosphere. The space is divided into functions by the use of the Beeching Island, the Giant Hive, the Miniature Hive and the Swarming Window, reflecting the beauty of form and function at the same time.

Element Extraction: The theme space adopts a hexagonal design language consisting of many geometric shapes, creating a honeycomb structure that is distinct and orderly arranged as a whole. In addition, the multilevel division of the space creates a transparent and open spatial form. The same hexagonal elements are used in interior panelling and furniture design, giving the whole space a more coherent design style. The designers of Planet Beehive have skilfully blended the structural elements of the hive with the needs of the actual building to create a space that is full of aesthetics and technology.

(3) Levitating Planet: The Levitating Planet theme space located on the first floor of the East 4th Building is full of creativity and futuristic sense, creating an intriguing spatial atmosphere through the elements of levitating boulders and flowing water. The theme space is an immersive exhibition hall and experience hall for nonheritage culture, using holographic projection technology to project nonheritage culture onto the internal shaped shapes. The external Student Cultural and Creative Hall provides a space for independent learning of nonheritage culture innovation and entrepreneurship. The central column is transformed into a floating boulder, while the ground is divided into two parts: the foundation and the renovation. The renovation ground is in the shape of a river, forming dozens of lakes, complementing Wuhan's reputation as the City of a Thousand Lakes.

Figure 6: Project Interior Design of the Nonlegacy Star River Effect Showcase

The third floor of the fourth floor of the East Building also adopts the theme of a hovering planet, which is named the star river of nonheritage. Compared with the design of the first floor, the third floor displays the local nonheritage culture in a more comprehensive way, and the meandering water-like form of the booth and the structure of the starry sky roof accentuate the whole atmosphere of the space in an appropriate way, and it seems as if you have fallen into the nonheritage river of the star, as shown in Figure 6.

Element Extraction: The design of Hovering Planet is inspired by flowing water and lakes. The flowing water symbolises life, flow and change and has the meaning of communication and connection, which makes the whole space more dynamic and aesthetically pleasing. The levitation elements in the space also symbolise dreams, fantasy and the future, creating a sense of science fiction and giving the space an air of infinite reverie. The five senses are the main path for human beings to generate memory, and the diverse types of intangible cultural heritage require the integration of other sensory experiences on the basis of visual senses [20]. The space is designed with the Realm of Levitation, Thousand Lakes and Flowing Water, Floating Journey and Levitating Countercurrent, which use holographic projection technology to project the ICH in high definition onto a screen that is suspended and flowing in the air [21]. The content contains a variety of forms, such as photos, videos, and audio, as well as features that allow for interaction and multiangle viewing. The audience can interact with the display content through gestures and voice to learn more about nonheritage culture [22].

(4) Planet Prism: Located on the east side of the ground floor of East 4th, the Planet Prism themed space is an intelligent, unmanned supermarket that adopts the DTC model, allowing customers to make reservations online and pick them up offline automatically through a cargo conveyor. This space can not only meet retail needs but also become a place for leisure and socialising, making it an open and multifunctional space. At the same time, the atmosphere of the space is rendered through refraction and reflection between the mirror-light cloud steps, falling prisms and crystal display cabinets, the distribution of which is shown in Figure 7.

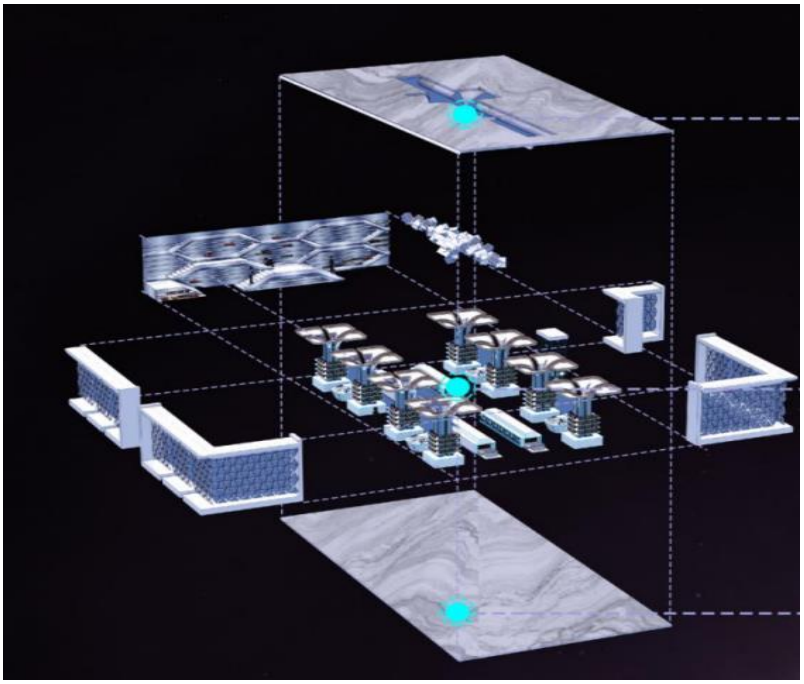

Figure 7: Project Prism Planet Analysis

Element Extraction: Drawing inspiration from the form of prisms and making full use of the characteristics of prisms, such as reflection, refraction, and light splitting, a large number of prismatic mirrors are installed on the façade, dividing the space into different zones and creating a crystalline and transparent visual effect. In addition, through the prism falling device, different sizes of prisms are combined into cracks, creating interesting and irregular visual effects. The whole space is practical and aesthetic but also incorporates fun, bringing consumers a new shopping experience.

4.5 Lighting design for commercial complexes

The interior lighting design of public buildings has become an important means to show the aesthetic charm of architecture and enhance spatial expressiveness, and designers continue to seek innovation and breakthroughs, exploring a diverse range of design themes [23].

Over the past hundred years, lighting design has been developed by leaps and bounds, especially in the past two decades. With the continuous innovation of material technology, the form of lamps and lanterns is increasingly diversified, and the light adjustment ability is increasingly strong, which provides strong support for indoor lighting design. Modern public building indoor lighting design is no longer satisfied with a single lamps and lanterns, space lighting, but according to the specific design theme, through the unity of the light effect and art form, in order to achieve a coordinated articulation with the spatial design, to achieve the desired performance effect [24].For example, Tadao Ando's Chapel of Light blurs the edges of the building by blurring the light and "solidifying" the natural light inside the building, echoing the grandeur of the church building. This design style conveys a strong sense of mystery and purity, allowing visitors to enjoy spiritual baptism in an atmosphere of light. Therefore, public interior lighting design has become an indispensable and important part of modern architectural design, and its artistic charm and expressive power have been recognised and respected by an increasing number of people. It is expected that in the future, with the continuous progress of science and technology and the evolution of aesthetic concepts, interior lighting design will continue to innovate and provide more excellent solutions for the aesthetics and functionality of architectural space, and the overall lighting design effect of the project is shown in Figure 8.

1) Mechanical Planet: The lighting design of the mechanical planet is based on the theme of future science and technology and adopts the combination of cold and warm tone light sources, linear light sources and point light sources to create colourful lighting effects.

2) Beehive Planet: Beehive Planet, on the other hand, makes full use of the shape and structure of a beehive to create a simple, bright interior by harvesting sunlight and using cyan linear and flat lights.

3) Hovering Planet: Hovering Planet creates realistic, three-dimensional image effects through holographic projection lighting technology, giving visitors an unprecedented experience.

4) Prism Planet: Prism Planet makes full use of the combination of natural light and indoor artificial light sources to create a unique indoor atmosphere and, through the prismatic reflection of light and shadow effects, forms a mysterious and fantasy prism world.

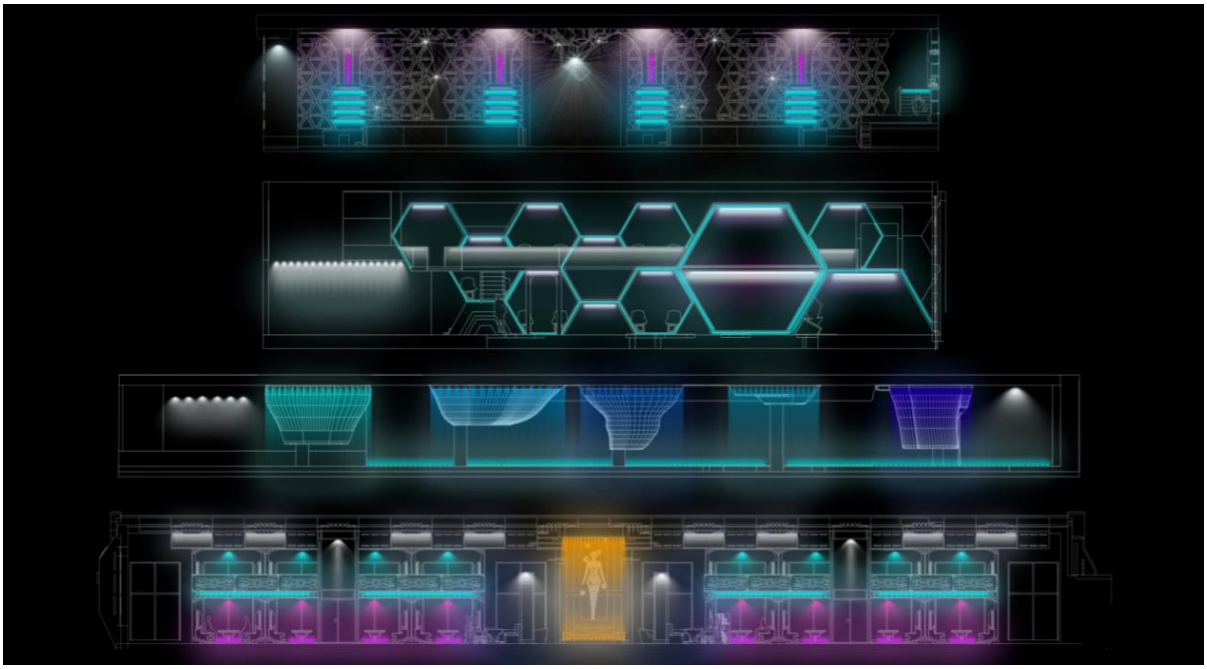

Figure 8: Overall lighting design effect diagram of the project

Lighting equipment should first meet the basic lighting function of the commercial complex. On this basis, through their respective unique techniques, people are immersed in the perfect combination of future technology, nature, art and practicality [25]. This kind of lighting design is increasingly used in modern architectural design, becoming an indispensable and important part. With the continuous evolution of science and technology and aesthetic concepts, interior lighting design will achieve better innovation and development in the future.

5. CONCLUSIONS AND OUTLOOK

With the development of the times and the progress of science and technology, traditional intangible cultural heritage is facing the danger of being lost, so the protection and inheritance of traditional culture is particularly important. The commercial complex is one of the indispensable and important places in contemporary life, so it should do its part for the protection and inheritance of traditional culture. This design aims to combine traditional nonlegacy culture with modern technology and present it to people in a novel way so that they can still feel the charm of traditional culture in modern life. At the same time, the design of the commercial complex also takes into account the needs and consumption habits of modern people, creating a place that integrates a variety of experiences. Through the mutual integration of scientific and technological means and cultural creativity, the design of the commercial complex basically achieves the trinity of cultural heritage, commercial operation and scientific and technological innovation. The spatial design of the commercial complex takes traditional culture as the main planning clue and combines the functional needs of the commercial complex to create a spatial experience with a sense of the times and a sense of art [26]. In terms of hardware, the commercial complex will try to retain the historical memory of the original buildings, follow the rules and aesthetics of traditional architecture, and create a strong traditional atmosphere while achieving modern comfort and convenience [27]. In terms of software, the commercial complex will develop an immersive meta-universe experience, combining traditional cultural elements to create an immersive experiential space integrating nonheritage culture, creative design and commercial services.

REFERENCES

[1] Rui Yong. Research on the development and planning of commercial complexes in emerging medium-sized cities in China against the background of consumption upgrading [D]. Suzhou University of Science and Technology, 2019.
[2] Cui Shijin. Reconstruction and Entropy Increase of "Readable City"[C]//Proceedings of Interior Design 2022 of the Interior Design Branch of the Architectural Society of China. China Water Resources and Hydropower Press 2022:45-48. DOI:10.26914/c.cnkihy.2022.072004.
[3] Fu Yunjin,Wei Yuhan. Development status and trend of meta-universe immersive interaction technology[J]. China Economic Report, 2022(06): 98-107.
[4] Fan Yumeng. Innovative Strategies of Physical Commercial Marketing Mode under the Background of Scene Marketing--Taking Wuhan Area as an Example[J]. China Business Journal, 2022, 858(11): 27-29. DOI:10.19699/j.cnki.issn2096-0298.2022.11.027.
[5] GUO Hai,YANG Dong-En,DING Jie-Bin. Meta-universe business model:connotation, classification and research framework[J]. Foreign Economy and Management,2023,45(03):23-45.
[6] Hu Zhenyu. Exploration of night landscape design of urban commercial street [D]. Nanchang University,2022.DOI:10.27232/d.cnki.gnchu.2022.004358.
[7] LANG Jialin,WANG Li. Linkage between urban complex and university campus - Taking Liaoning University of Science and Technology and Renhe Xintiandi site as an example[J]. Housing and Real Estate, 2016(6):33.
[8] Lei Xi. Research on the Innovation Architecture of Chinese Non-Heritage Industry under the Background of New Consumption [D]. Xi'an Academy of Fine Arts, 2022. DOI:10.27399/d.cnki.gxamx.2022.000103.
[9] LI Changchang, LIANG Hongxinyi, LI Xiaofeng. Research on spatial scenario of modern commercial complex[J]. Dwelling House, 2022(33): 154-157.
[10] Lv Yipin. Interactive exhibition experience design of intangible cultural heritage under the perspective of contextual narrative[J]. Footwear Craft and Design, 2022, 2(11): 94-95
[11] Marper. Research on the Commercial Application of Public Art under Regional Cultural Intervention--Taking Chengdu as an Example[J]. Green Packaging, 2022(10): 174-177.
[12] MEI Le, LI Jiaqi, LI Junfeng, LI Ruitao. Design of Intelligent Low-carbon Park Management Platform Based on Digital Twin--Taking Foshan Foshan Fozhong Talent Lighthouse Industrial Park as an Example[J]. Intelligent Building and Smart City, 2023(03): 14-17.
[13] PAN Fang, HUANG Zhejiao, XING Yan, LI Rongxin. Trend analysis and strategy suggestions for the transformation of Beijing's shopping districts against the background of urban renewal[J]. World Architecture, 2023(04): 21-25. DOI:10.16414/j.wa.2023.04.021.
[14] Qiao Honglin. Research on commercial space environment design based on interactive concept[D]. Shenyang Architecture University, 2022. DOI:10.27809/d.cnki.gsjgc.2022.000351.
[15] SUN Jianxia. Analysis of architectural design scheme of urban commercial complex[J]. Brick and tile, 2023(3):82-84. DOI:10.3969/j.issn.1001-6945.2023.03.016.
[16] TAN Xue-ming. Research on design points and future development trend of urban commercial complex[J]. China Construction, 2022(07): 69-72.
[17] TANG Xianhong, CHENG Baofei. An analysis of the design strategy of "re "renovation of university creative space[J]. Art and Design (Theory), 2023, 2(02): 52-54.
[18] Wang Fei, Gu Hao. Exploration of the path of spatial renewal planning in higher education--Taking Huazhong University of Science and Technology main campus campus masterplan design as an example[J]. Architecture, 2022, 951(07): 78-80.
[19] Wei Juntao, Ren Limin. Research on the transformation of intangible cultural heritage design under the view of digital twin[J]. Packaging Engineering, 2023, 44(06): 302-310.
[20] Yong Sheng. Application of multimedia technology in exhibition display design[J]. Culture Industry, 2023(07): 16-18.
[21] WEI Hua, DONG Xueli, WANG Shuping. Research on the Development Mode of Innovative Neighbourhoods under the Perspective of Integration of "Industry-City-Creation"[J]. Industrial Innovation Research, 2023(06): 69-71.
[22] Yuan Peng, Li Junfeng. Research on Open Space of Commercial Complexes in the Internet Era[J]. Journal of Hefei University of Technology (Social Science Edition), 2017, 31(2): 113-118. DOI:10.3969/j.issn.1008-3634.2017.02.019.
[23] Zhou Fuguang. Research on the Protection and Development of Nonlegacy in Zhangzhou Based on Tourism Activation[J]. Journal of Huangshan College, 2021, 23(04): 28-33.

[24] Zhang Huicheng. A study on landscape space renewal of evacuation sites in urban fringe areas against the background of keeping white and increasing green [D]. Beijing Forestry University, 2021.
[25] Zhang Yuequn. The "Experience Turn" of Urban Consumption Space and Its Logic of Cultural Production--Taking SKP-S Commercial Complex as an Example[J]. China Book Review, 2022(05): 27-39.
[26] Zhuang Chong, Li Yuzhou, Li Yang. Construction of intelligent operation and maintenance platform for equipment big data based on digital twin[J]. Sichuan Architecture, 2021, 41(04): 211-213.
[27] ZHANG Yumeng, YANG Sobaemeng, LI Chaochao, TAO Yumeng, ZHANG Hao. The Sideburns of Chinese Clothes--Digital Intelligence Combined with Tradition, Bringing Non-Heritage Clothes to the World[J]. Internet Weekly, 2023(05): 76-78.
[28] Shi M. Discussion on the Relationship between External Space Behavior Group of Commercial Complex and Visual Environment[C]//Wuhan Zhicheng Times Cultural Development Co., Ltd. Proceedings of 3rd International Conference on Art, Design and Cultural Studies (ADCS 2021). BCP, 2021:135-138.DOI. 10.26914/c.cnkihy.2021.009650.