

# Design of college students' innovation and entrepreneurship project based on virtual home improvement system

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**Abstract:** In recent years, virtual reality technology has been widely used in architecture, home decoration design and other fields. The project team combined the current situation and problems in the field of building decoration and decoration, the use of VR technology, 3D modeling technology and real-time rendering technology, designed and developed a virtual home improvement system. This paper takes this system as the background, combined with the college students' innovation and entrepreneurship project, analyzes and introduces the whole process of college students' innovation and entrepreneurship activities, aiming to provide reference and reference value for the same type of activities and projects, and stimulate college students' entrepreneurial spirit, cultivate innovation ability and practical ability.

**Key words:** virtual home improvement system; Innovation and entrepreneurship project

With the high-quality development of China's economy and the improvement of people's living standards, everyone will always want to decorate their homes to suit their own desires. Since 2003, the total output value of residential decoration in China has shown an overall growth trend. However, when the owner and the decoration company or the designer discuss the decoration plan, there may be a deviation in communication, resulting in the house decoration did not reach the standard that the owner wants. At this time, if it is dismantled and installed, it will cost a lot of money and waste a lot of time.

## 1. Preliminary research and analysis

In the past two years, under the macro-control of the government, housing prices have maintained a reasonable slow growth, and some places have seen housing prices fall. This stimulates the desire of post-90s and post-00s demanders to buy houses, and VR technology is also favored by them. Therefore, the steady development of real estate brings unlimited opportunities to the home improvement industry, and the development of VR technology will also drive the development of virtual home improvement system.

## 2 Technical Requirements

Members of the project technical team structured the functions and modules of the VR home improvement system, and set the technical requirements of the system as follows:

### 2.1 Indoor panoramic roaming

By wearing VR devices, users can get rid of the limitations of space and time in the real world. When users stand in an open place and wear virtual reality glasses, they can be immersed in the future home and truly feel the space layout and effect of the future room after installation. Walk freely in the virtual space, go through every corner of the room, view the decoration style of the house and the collocation of furniture from all aspects and multiple angles, and can accurately grasp the size of the space. In a virtual space, the user goes to the direction of the table, the grain of the vase on the table will be more clear, squatting down, you can see the stitching of the floor. This technology is more viewable than VR panorama rendering, which can enhance the user's sense of engagement.

### 2.2 Lighting effect control

Compared with the lighting effects of other VR home improvement systems on the market, our team gets rid of the drawbacks of traditional lighting that can not be adjusted through real-time rendering technology, so that users can freely adjust the lighting in the room in real time, simulate the most real lighting effect, so as to obtain a more realistic light and shadow experience, and allow users to fully understand the indoor lighting effect.

### 2.3 Control of indoor furniture and home appliances

In order to better serve users, our team decided to design a function to add more environmental interaction comparable to the real world, so that users can not only feel the real immersion brought by the future home, but also control furniture and home appliances through interactive devices. Under this technology, users can freely turn off and open electrical appliances, can open the closet or drag the table on the small decoration, all can be used at will, a good simulation of the real interaction in real life, increase the humanized experience of virtual space, so that users in the design process have a different feeling, in advance with the future new home "interaction" up.

### 2.4 Replacement of different styles of home decoration style

In the purchase of furniture, the user in the furniture building materials mall to buy furniture, often the grasp of the decoration style is not very sure, it is usually difficult to determine whether the size of the furniture is suitable, whether the interior layout is suitable, in view of this pain point, our team through cooperation with the home improvement company, the product into the system in the way of model, and according to different needs to develop a series of home improvement style, Such as modern, Chinese, European style and so on. In this project, the user only need to input the house type map into the system, you can flexibly choose different decoration styles according to their own preferences and needs, and compare various styles to choose a more suitable decoration style, in order to provide more convenient and fast service, you can also choose the system according to the design scheme provided by the house type to install, greatly improve the user's decoration effect and progress.

### 3. Entrepreneurial team building

#### 3.1 Composition of Members

This project consists of 7 students. Among them, 1 is in charge, 3 are from the technical department, 2 are from the Marketing Department and 1 is from the finance department. The project leader has a strong sense of innovation, a sense of collective honor, and is good at communication. The technical developer comes from the major of virtual reality technology and digital display technology, and is good at Unity3D development, 3D modeling, PS image processing, C# language development, interior design, etc., with quick thinking, she can put forward new ideas. Marketing staff are familiar with enterprise management, able to master and analyze the changes of market economy, familiar with marketing methods, and rich in communication skills. The financial department is responsible for the overall planning of project funds, budget and expenditure statistics.

#### 3.2 Team culture

A good team culture is extremely important for a team. The external manifestation of team culture is that the team has the same working goal, the group activities are carried out and the learning system is implemented. All members of the team are willing to devote their talents to the team, in order to strive for “virtual home improvement system” can achieve good performance. Learning is an important part of the construction of team culture, because the attitude of learning reflects the spirit of the team and is the guarantee of team work skills. The team regularly holds learning exchange activities and skills training to maintain learning ability and enthusiasm, and regularly carries out team activities to cultivate a good team spirit and culture and improve the overall cohesion. In addition, the main method used in the management of team innovation is to hold a meeting in the form of brainstorming, where everyone expresses their opinions, gathers wisdom and chooses the most appropriate method.

### 4. Marketing Strategy

This project adopts STP strategy for marketing promotion.

#### 4.1 Market Segmentation

According to the standards of market segmentation, the analysis and coping strategies of geographical factors, demographic factors, psychological factors and behavioral factors are as follows:

**Geographical factors:** The research and development site of this project is located in Guangzhou, so we will use this city as a base to find a home improvement company that is interested in cooperation, and then radiate to the Greater Bay Area to find customers for cooperation.

**Psychological and behavioral factors:** In recent years, virtual reality technology has been widely used in architecture, home decoration design and other fields, virtual home improvement system can meet the current crowd of home improvement selection more convenient, more economical yearning and pursuit, while the traditional home improvement line in the physical selection of today is gradually eliminated. This project will seek cooperation with home improvement companies that dare to innovate and pursue excellent after-sales service quality.

**Demographic factors:** This project is aimed at the young users and home improvement designers who have the demand for home improvement. This group of people has a strong acceptance and inclusiveness of new things.

#### 4.2 Target Market

The target market of this project is: decoration companies implementing soft decoration and hard decoration, furniture customization and sales companies and O2O home decoration mall. In the system, improve its industrial chain, connect suppliers and consumers, consumers are optimistic about the goods can be directly purchased, you can automatically calculate the decoration budget according to the selected furniture, improve the input and output ratio.

#### 4.3 Market Positioning

VR home decoration has gradually become the main force since this year, there are several companies in the main part of the product, and have released video DEMO and preliminary products, but at present many Internet + home decoration platform basically still stay in the provision of information services for consumers. This project will be positioned in the combination of online + offline home improvement O2O model, online to provide home improvement solutions and information, offline follow-up decoration service level and quality, and strive to make users truly satisfied.

### 5. Operation mode

The project team will benefit from the home improvement company, and the home improvement company will obtain the right to use the technology from the project team. If the system needs to be updated in the future, the price will be increased on the basis of the original, and the specific discussion with the home improvement company to decide.

#### 5.1 Customer Classification

The customers applied in this project are mainly soft installation companies and hard installation companies;

#### 5.2 Tripartite relationship

The three parties of this project include the technical party (us), the home improvement company and the consumer. The relationship between the three parties is as follows:

(1) Technology and soft and hard decoration companies:

The technical side obtains benefits from the home improvement company;

The home improvement company obtains the right to use the technology from the technical party;

#### (2) Technology and consumers

Consumers experience the sense of quality virtual world from technology;

Consumers can promote the technology, help the technology side to promote and increase the customer base;

#### (3) soft installation, hard installation companies and consumers

Home improvement companies to provide consumers with good purchase services;

Consumers to the home improvement company to bring higher consumption return rate and praise;

#### 5.3 Strategic partners

The project will establish long-term strategic partnerships with home improvement companies, furniture suppliers, etc. In addition, we will also establish a strategic partnership with the home improvement company exhibition, expand the visibility of the home improvement system, and display the system in an all-round way in the furniture exhibition.

#### 5.4 Cost structure

The operating cost structure of the project is mainly composed of labor and maintenance fees. Among them, the personnel labor cost is mainly the labor cost for the entrepreneurial team and its professional instructor to carry out system research and development and publicity work. In addition, in the later stage, in order to make the home improvement system keep pace with The Times and meet the market requirements, it is also necessary to reserve some costs for research and development and update.

#### 5.5 Profit model

The main business income of this project comes from the home improvement company, from which the technology use expenses are obtained. When consumers buy part of the furniture and home improvement equipment from the system, the project team can also collect a certain amount of commission from the furniture supplier to achieve mutual benefit and win-win situation.

## 6. Risk Management

### 6.1 Risk Analysis

(1) Technical risks are mainly reflected in the failure of home improvement system development. The success of home improvement system development depends to a large extent on the professional quality of the team members and whether they have in-depth research, understanding and mastery of the business process.

(2) The fluctuation of product price affects the income. With the gradual intensification of competition between late entrants and existing competitors in the industry, the price of home improvement systems will also fluctuate, which may affect the project revenue.

### 6.2 Risk pre-control

(1) The team leader should first actively follow up the project progress, make timely and correct responses according to market changes, do a good job in product patent protection, and build the brand. Secondly, the person in charge should drive the enthusiasm of the team members, improve work efficiency, and establish a complete and orderly management system that can be implemented.

(2) Adopt various measures such as internal training and external introduction in technology to improve the professional quality and skill level of technical developers; Instructors can use their own resources to provide ideas and technical routes for the realization of home improvement systems by inviting experts and engineers to hold lectures and training meetings.

## 7. Conclusion and outlook

College students, as the hope and fresh blood of social development, need to boldly go out of school, communicate with enterprises face to face, understand the industry dynamics, apply the knowledge and skills they have learned to social practice, and bring more practical experience back to the classroom. And all kinds of college students' innovation and entrepreneurship programs are good platforms to cultivate college students' innovation and entrepreneurship ability. Through the analysis and introduction of the innovation and entrepreneurship activities of college students based on virtual home improvement system, this paper hopes to stimulate the entrepreneurial passion of college students and strive to improve self-innovation ability and practical ability.

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