

# Research on the Innovation of Digital Animation Technology in Landscape Plan Design

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## ABSTRACT

With the rapid development of computer digitization, digital technology is widely used in design industry. This paper mainly takes the digital research situation in the Chinese landscape design as the main body object, expounds the advantages and convenience of the computer digital technology to the landscape design, and through the comparative analysis of the Chinese digital landscape design research results, tries to find more innovative design in the field of landscape two-dimensional graphic design.

**Keywords:** Landscape design, Digital animation technology, Landscape plan.

## 1. INTRODUCTION

At present, digital technology is the core technology in the field of design. Many related design majors also need the support of such high and new technology, such as landscape design. Through the cooperation between related majors, we can produce more perfect visual effects and create higher social benefits. The author fully takes into account the disadvantages of traditional landscape design methods, coupled with the gradual popularization of digital technology, and the application of digital animation technology is the new cross-border integration, gradually using digital animation technology to design, can produce more amazing dynamic effect display. That is, before the landscape architecture is put into construction, the two-dimensional static plan will be developed into dynamic plan by using computer technology, so that customers can more comprehensively understand the main components and expected effects of the project. Not only in landscape design, but also in other fields such as product design and clothing, which can promote the reform of the whole design industry. In view of the Chinese existing digital landscape design in a large number of positioning system, three-dimensional modeling, virtual reality and other technology analysis, and extremely lack of research on the dynamic plan, the author makes a systematic

analysis and discussion on the dynamic plan design of landscape design.

## 2. THE ORIGIN OF LANDSCAPE DESIGN

The word "landscape design" was first put forward by Frederick Kraumsted, the "father of landscape design" in the United States. As a new major, although it has only been opened for about 20 years, it combines a variety of complex disciplines of science and art, mainly human visual effects. Based on the natural environment, a design thinking mode of artificial environment is designed.

"Landscape design" literally means combining landscape with design to form a new discipline and create a beautiful and functional landscape. To be exact, landscape design is based on the analysis of the original natural environment, social environment and human related needs, using the combination of scientific technology and artistic creativity, using language, writing, illustration, model and other methods to express the systematic process of building, constructing and improving the environmental space, so that the built buildings (groups) and the natural environment merge with each other to produce a corresponding relationship, making its use more convenient, comfortable and artistic value.

With the reform and opening up in the 1980s, China has absorbed a large number of western landscape design ideas, integrated and developed the single garden system in the past, and formed a multi-dimensional design trend of thought and method. Nowadays, the application of digital technology in landscape design, such as computer network, 3D modeling, virtual technology, two-dimensional graphic design and so on, not only increases the beauty and accuracy of landscape design, but also promotes the development and progress of the whole industry and society.

### **3. CURRENT SITUATION OF DIGITAL LANDSCAPE DESIGN**

It can be found in the theoretical research of landscape design that the research of dynamic graphic design is relatively scarce, and landscape design is lacking in this kind of design technology. The author analyzes the present situation of the three major research categories of landscape design in China:

#### ***3.1 CAD Sketch Combined with Image Processing Landscape Plan***

In landscape design, the most commonly used design method is to use two-dimensional graphic design, draw out the design sketch, and then build the landscape according to the sample of the sketch. Traditional landscape design uses CAD drawing software to complete scientific calculation and accurate drawing processing. At the later stage, the Photoshop software is used to process the image of the drawing, and the finished effect is considered synthetically and the artistry of the landscape is processed in time. As mentioned in DENG Wei and GUO Fei's "Digital Architectural Landscape Design", using CAD software to draw graphic sketches, designers can quickly express new inspiration on sketches, avoiding the tedious and long process of modification in the past, so that designers will focus more on the design itself.

#### ***3.2 Multi-dimensional Software and Multi-dimensional Visual Experience***

Three-dimensional modeling is used in landscape design to improve the clarity and efficiency of landscape design and improve the authenticity of landscape design in the project. 3D software such as 3DMAX, Maya, 3Dlofter is used to make the digital model of the landscape, and the color quality collocation is given by using the

software such as material editor to better analyze the plastic arts of the landscape. In FANG Meiqing and SUN Lu's "On Digital Technology and Landscape Design", the three-dimensional model of landscape design is actually the simulation of the real scene. This kind of design technique not only makes the user or designer communicate the scheme better, but also improves the accuracy of the landscape, makes the landscape fully and dynamically displayed in front of the viewer, and greatly improves the reading of the drawings and the efficiency of the project implementation.

#### ***3.3 High Simulation Design***

In recent years, with the further development of digital technology, the digital technology used in landscape design has gradually developed from two-dimensional static plane technology to virtual reality technology. Using virtual reality technology not only improves freshness, popularizes landscape image, but also displays landscape image in all directions, realizes human scene interaction, and achieves the best virtual reality experience. According to the "Research on Elements of Digital Art Design and Landscape Design" by ZHANG Dini and FENG Xuejun, virtual reality technology can simulate 3D visual effects experience, which can make users immerse themselves into digital scenes and experience themselves. And choose the most suitable for their ideal landscape design.

### **4. DEVELOPMENT OF LANDSCAPE DYNAMIC PLAN**

#### ***4.1 Definition of Dynamic Plan***

At present, the digital research of landscape design is increasing day by day, but the research of landscape dynamic graphic design is quite scarce under the background of digitization. Dynamic plan in landscape design is based on the design of two-dimensional static plan, using digital animation technology, such as Flash, Pr, Photoshop software to add static map in two-dimensional plane design into dynamic elements, so that the design ideas and design schemes in the project are more clearly displayed in front of the viewer.

## **4.2 Meaning of Using Dynamic Floor Plans**

### **4.2.1 Cross-border Integration to Drive the Development of the Design Industry**

Nowadays, with the rapid development of digital technology, it has gradually become the core technology of the design industry, and put forward a new proposition to the practice and theory in the design industry. More and more designers combine landscape design with digital media technology to further make the initial landscape static design plan into dynamic plane display map. The viewer or builder can understand each detail effect and the general effect after implementation more clearly and intuitively. Digital animation technology is a new cross-border fusion, which can not only be effectively used in landscape design, but also make greater breakthroughs in other related design fields, thus driving the development of the whole industry.

### **4.2.2 Preventing Misreading and Improving Project Competitiveness**

Taking the same landscape design project as an example, the project with dynamic tender has more competition and participation rate than the project without dynamic tender. From the customer's point of view, the dynamic plan can give him a more direct understanding of the layout system of the whole landscape design in terms of project function, traffic streamline, landscape and water body analysis, greening analysis, lighting and lighting, and at the same time, improve the vitality and observability of the project design on the basis of the original. Due to the lack of relevant professional knowledge of some Party A customers, there will be obstacles to understanding in the face of professional drawings, resulting in errors in the interpretation of the designer's intention. If the design is displayed in a more intuitive way, it can help the designer and Party A to communicate better and improve the competitiveness of the project.

### **4.2.3 Increasing the Practicability of the Effect Map to Achieve Economic Income Generation**

To date, because it takes a lot of time to design and make, and the shortage of talents who can master this technology, it is not only time-consuming, but also increases the workload of designers in the process of repeated modification of

the scheme. So it is not enough to obtain higher economic benefits. However, in the long run, the future will be an era of digitization. If this technology is popularized, it will lead to great technological progress and create two-dimensional or multi-dimensional dynamic maps. It not only increases the visual communication and accuracy of the effect map, but also increases the practicability of the effect map, promotes the rapid development of the industry and achieves economic income.

## **4.3 Trend of Dynamic Plan in Landscape Design**

### **4.3.1 The Dynamic Plan Is Gradually Becoming the Dominant Design**

Landscape design has become a separate major for more than 20 years. Under the background of information technology era, landscape design has unprecedented development. In the future digital development process, dynamic plan will become an irreplaceable technology in the field of landscape design.

Taking the bid documents in the landscape design project as an example, the traditional landscape design only shows the layout system and the overall expected effect of the landscape in the whole project with the inherent static tender documents, giving the impression of rigidity and mechanical. With the continuous development of digital technology, under the new aesthetic thought and public demand in the future, the design and manufacture of dynamic plan will gradually replace the two-dimensional static plan. Moreover, the aesthetic foundation of two-dimensional animation left by traditional media still brings a certain market for the expression of landscape effect under two-dimensional animation technology, and this market is still in the process of continuous stability.

People's perception of the world is multidimensional. The application of dynamic plan in landscape design is based on the advanced technology of digitization to approach reality step by step, restore reality, so that people can understand and experience the construction of the whole project landscape from the perspective of multidimensional. Such innovative design will greatly promote the development of the entire technology industry and will be popularized in the future.

### 4.3.2 Application Analysis of Dynamic Plan of Kunming Industrial Park

Based on the general plane, functional zoning, traffic flow line, landscape axis, water body analysis, greening analysis, lighting and node analysis of the landscape design project in the whole Kunming Industrial Park, the author makes the forecast analysis of dynamic digital innovation design.

#### 4.3.2.1 Dynamic Lines and Balls on Main and Secondary Main Roads Inside and Outside

Dynamic elements are added to the graphic design of two-dimensional static functional partition with Flash software, so that the design diagram can fully show the detailed characteristics of each functional partition. Make the customer

understand the detail effect of each functional partition in the landscape design project drawing more clearly and intuitively. By using Flash animation software, the main and secondary roads in the landscape design project are presented in the form of dynamic direction with different colors, different sizes of lines and small balls, which can make the viewers understand the orientation of each route more clearly. ("Figure 1", "Figure 2") In the Flash software, draw the motion path of each color ball and each line in each layer, set the key frame according to the time and speed, and set the motion path to the guide layer to guide the walking track of each ball. In the process of generating various motion paths, a mask layer is drawn in the library first, and the command of the mask layer is used to make it. According to the speed of the path, the frame number of the mask layer on the time axis is adjusted to make the guiding path smooth.

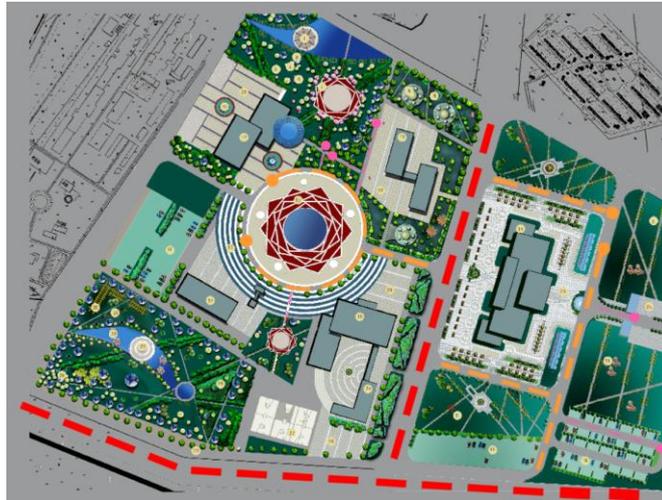


Figure 1 Landscape map.

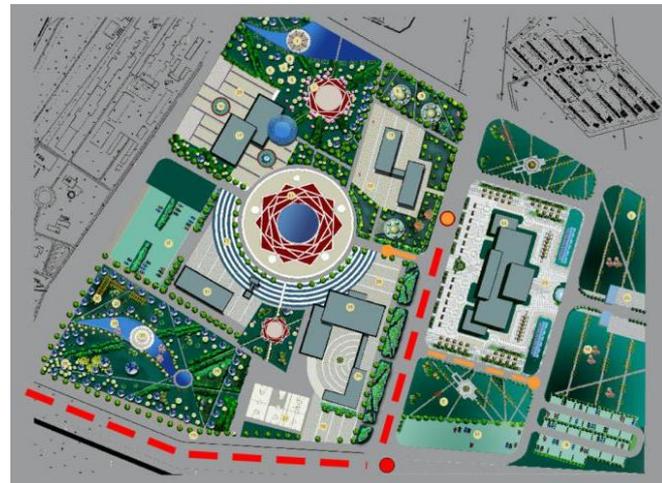


Figure 2 Landscape map2.

4.3.2.2 The Guiding Axis Is Shown in a Scattered Direction

At the end of the animation, the command of the mask layer on the left side of the screen gradually shows the signs derived from the two different colors of the axis. ("Figure 3", "Figure 4")

This method effectively clarifies the distribution location and axis direction of the primary and secondary landscape for the viewer, displays it in a bird's-eye view, and style from point to surface leads the viewer's sight to every corner of the whole map, which increases the readability of the landscape plan.

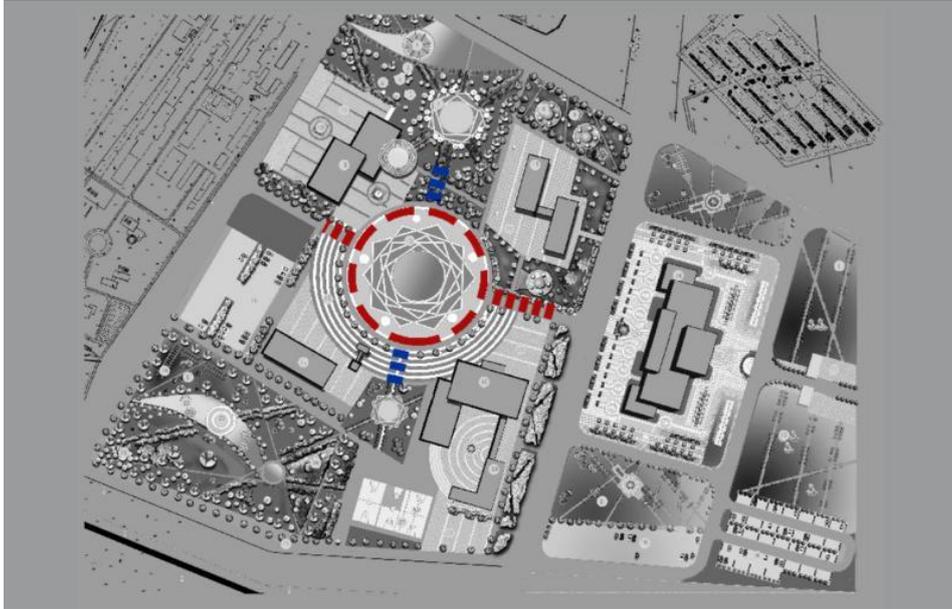


Figure 3 Landscape axis map.

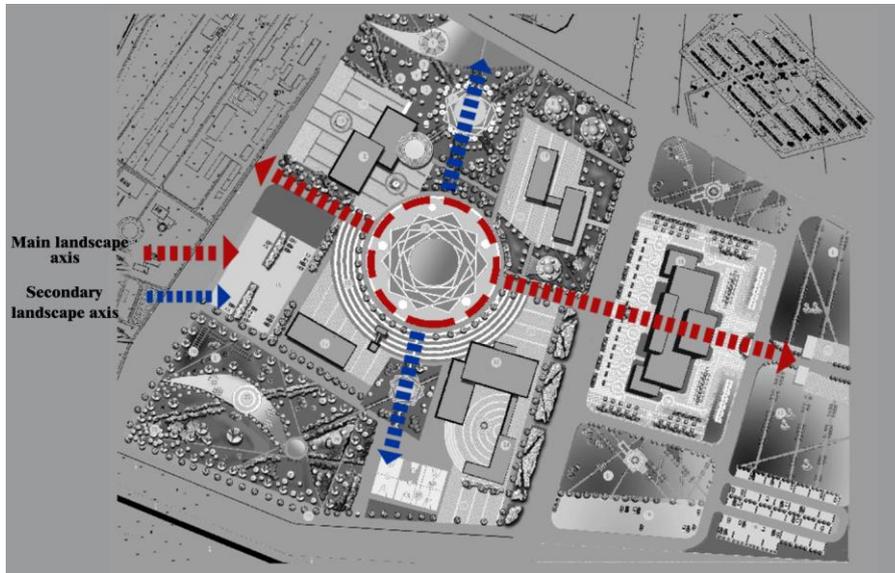


Figure 4 Landscape axis map2.

4.3.2.3 Flash Animation Simulates Night Lighting

In the lighting part, digital technology, such as PS, Flash animation, is used to simulate the effect

of night lighting, and the night lighting effect simulation in the design diagram is displayed. The PS technology is used to adjust the landscape plan into night mode and to draw the light and shadow on the new canvas. The landscape plan and the light

and shadow are introduced Flash the stage and library respectively, and then the light and shadow parts are accurately fitted to the landscape plan in the stage. With the flicker of lights, the surrounding scenery is changing. The lights become bright, the surrounding scenery can be seen clearly, the lights

dimmed, and the surrounding design darkened. The development of this field has never been involved in the design process of landscape plan, and the innovation will greatly promote the technical progress and innovation of the whole design industry. ("Figure 5", "Figure 6")

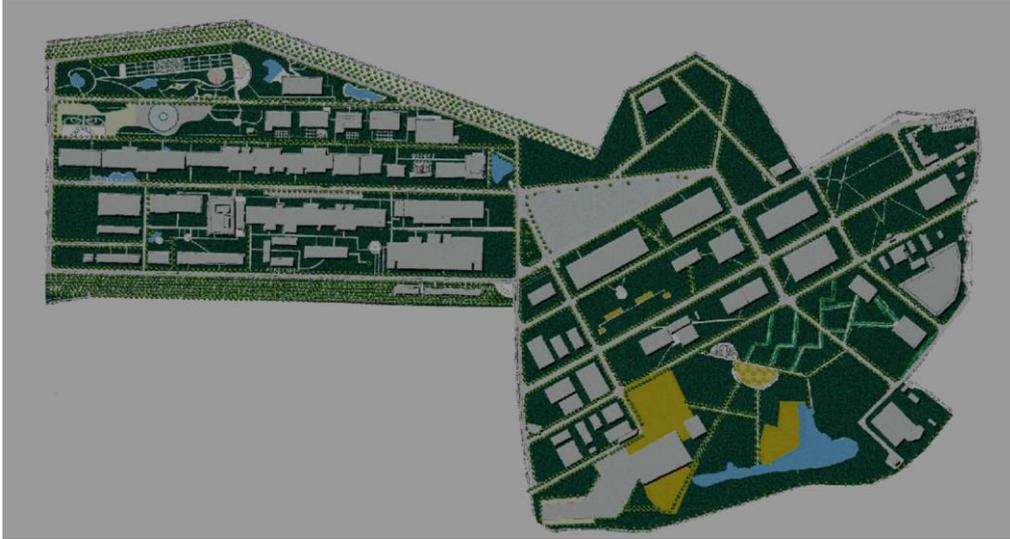


Figure 5 Lighting effect picture.

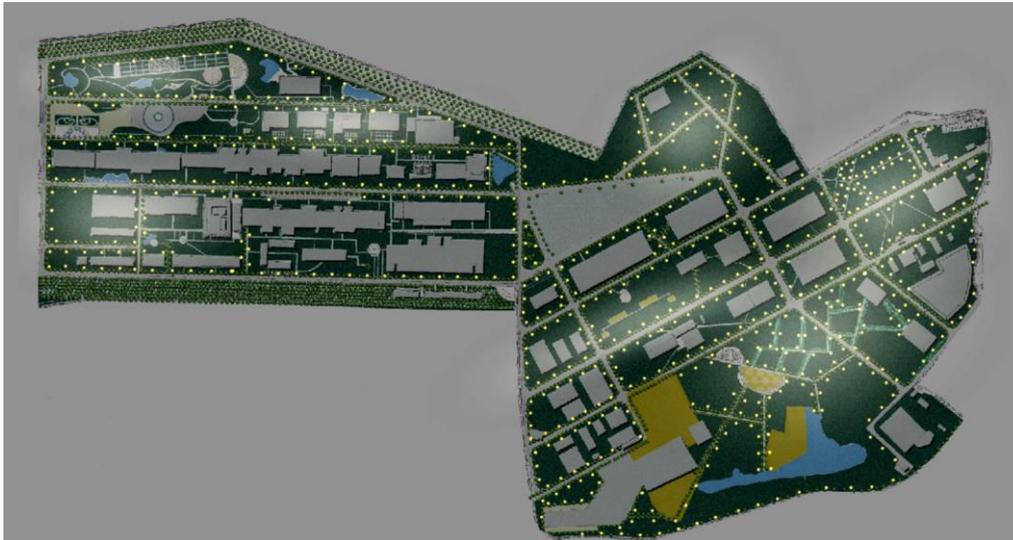


Figure 6 Lighting effect picture2.

4.3.2.4 Selective Display of Functional Partitions and Intersection Nodes

With regard to traffic junctions ("Figure 7") and functional partitions ("Figure 8"), digital design methods are also used to draw blocks of different colors of each functional partition and nodes of different sizes in traffic junctions with PS and Flash software. The layers of these different colors are

placed in the corresponding position of the landscape graphic design. After making with Flash animation software, the viewer can click on the part to watch according to his own needs, which will be displayed slowly, and the others that do not need to watch will be hidden. This makes the design of the tender in the landscape project more intuitive and detailed to show the characteristics and signs of each area, and the viewer can see the effect more

conveniently in the area that needs to be understood in detail in the project.

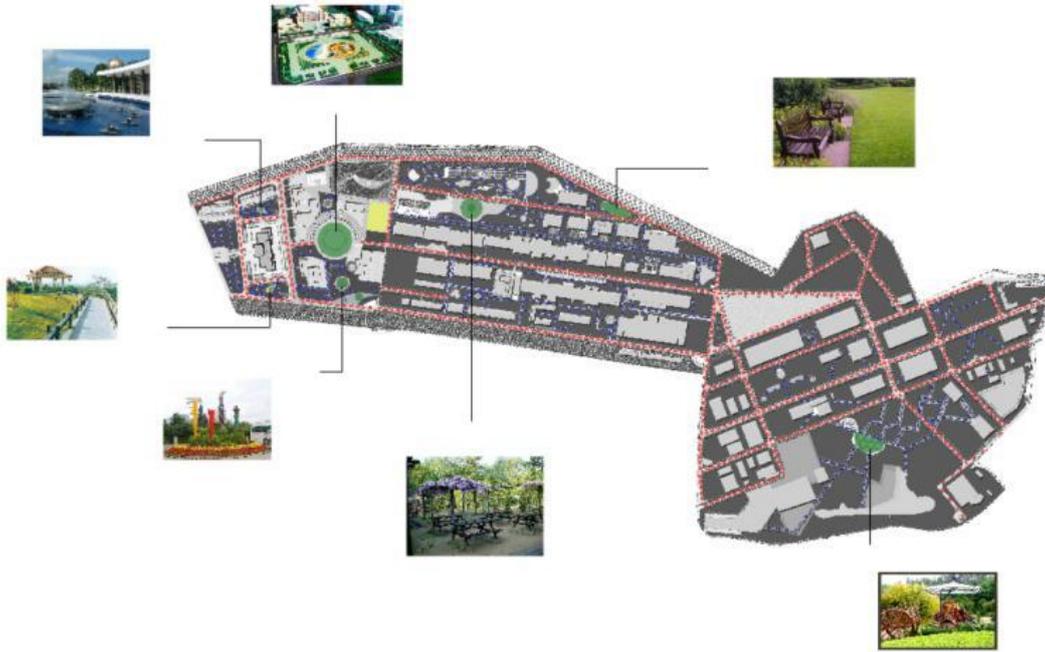


Figure 7 Traffic intersection analysis chart.

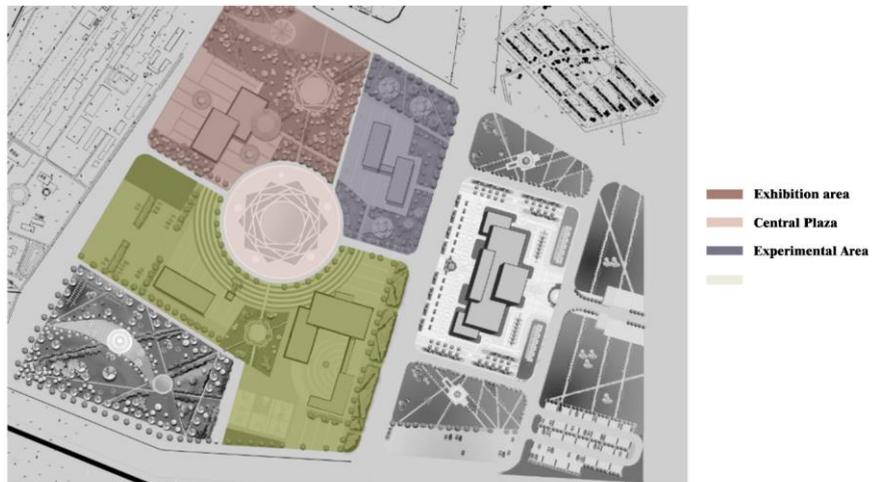


Figure 8 Functional zoning map.

Through the research of the above two-dimensional dynamic plan of landscape, it is expected that its new innovation point, which will help the viewer to understand every detail of the landscape design project more clearly, and will be paid more and more attention and use. In such a

trend, landscape design major in the present or in the future will be an unprecedented development.

### 4.3.3 Future Prospect of Landscape Dynamic Plan

In the present development form, the design of static two-dimensional plan is further processed into dynamic plan, and the visual experience of the viewer is increased by multidimensional design effect. However, the production cost of landscape dynamic plan is high. On the basis of the design of static plan, it will take a lot of time and manpower to use digital animation technology to change static map into moving graph. However, if this technology is popularized or even extended to other specialties, it will impact the development of the whole digital industry and the progress of society. In the process of landscape dynamic plan design, it is necessary to master the drawing of landscape plan and the application of digital animation technology. However, there is a lack of attention to this professional technology in the education and teaching of colleges and universities. There are few teachers and few cross-curriculum courses. Therefore, the cultivation of innovative talents is an urgent matter in this era. It can not only enhance the hard strength of individual specialty, but also increase the possibility of employment. Innovation and cross-border integration of technology industry are the artistic means that modern people need to master.

## 5. CONCLUSION

To sum up, although the digital research of landscape design is increasing day by day, the research of landscape dynamic graphic design can be carried out against the background of digitization is quite scarce. By using the digital technical route of Flash, AE, PR software and two-dimensional graphic design, the dynamic tender of landscape design will be made. Therefore, this subject has a considerable research space, the use of digital technology and landscape design cross-border innovation, but also has certain theoretical and practical research support, will bring the latest research results.

## AUTHORS' CONTRIBUTIONS

Yujie Lu wrote the manuscript, Peihuan Wang contributed to revising and editing the paper.

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