Construction and Research of Digital Product Design Platform

Hao Jun Wang

Abstract. With the development of electronic information technology, digital design platform design has become mainstream. To build a platform for digital product design is in line with the current development trend. In order to adapt to market personalized, customized direction of rapid development, shorten the development cycle and reduce research costs and enhance the quality, we should devote human resources to carry out research and implementation, use digital technology as a tool, digitizing product structure and product design, the key is to design products integrated information system.

Keywords: Digital platform, Digital technology, Integrated Design.

Introduction

In the field of industrial product design, whether domestic or foreign, digital design has become a new technical to deal with daily affairs and is widely used for enterprise, this technology has been deeply into the entire process of product design. We use the way of forums and exchange group exchange from product planning, design to manufacturing. This paperless method greatly improved the efficiency, and strengthened the participation and enthusiasm of the designers, and digital design entirely by digital means to complete, it’s truly "paperless design and manufacturing."

However, due to the different levels of the development of computer hardware and software, digital differential between enterprises, computer-aided materials collection and database construction, imperfect development of computer network technology and database technology and technical designer, industrial products digitizing jagged and lack of harmonization, so that digitizing has not really reflect the efficiency and effectiveness. Use database management mode differentiate, dynamic database management, update at any time to ensure the designed information is new and comprehensive to make an interactive communicate, trade, learning stage. According to the dictionary explanation, platform is called stage, is a learning stage that people exchanges, trade which has a strong interactive nature.

Hao Jun WANG, Hubei Business College, XiongChu Road No.634, Hong Shan Region, Wuhan City, Hubei Province, China 430079 bjmdngs@163.com
For example the information platform and construction platform, etc. Here digital design platform is borrowed from its extended meaning, computer aided painted expression virtual digital platform as a product design, interaction, learning and the exchange of data in order to play a role in the whole space.

In recent years, we have made considerable progress due to computer technology and hardware technical support. The typical thing is the use of Wacom's tablet and digital screen, many software companies have developed an easy-to-use hand-drawn design software, such as Alias SketchP ro developed by US Atlas company, Painter software developed by Canada's Corel corporation, they all can simulate hand-painted, depict a variety of color and texture.

Development status and trends of industrial product digital design

Computer-aided two-dimensional, three-dimensional design of industrial products, mainly relying on the digitized computer technology and information technology. Dimensional design computer-aided need United States’ Adobe and Photo cooperate with each other, formed a three-dimensional network from hardware to software.

1. Situation of modeling digital design of industrial products

Digital home and abroad are mainly two-dimensional representation designed by ancillary products like "hand", by way of the three views, with nuanced detail expression. It expressed the originality and usefulness of the product, makes clear the relationship between specific dimensions and design intent firstly to facilitate evaluation of the design in advance. Digital product design major includes hardware and software, status and level of hardware mainly reflected in advanced computer technology, mainly by means of the rapid development of computer technology, three-dimensional design includes Alias, Rhino, 3Dmax modeling, etc., expressing design and manufacturing has been developed to a very high level with computer platform. The popularity of computer hardware has been gradually transition from single-core to dual-core or even more cores. To implement the process of product showcase by three-dimensional modeling software, now has exceeded the memory capacity to 4G, 8G.Then use the rendering software for rendering real material, the product can be truly reflected, it has greatly improved the design efficiency, therefore, the design of the products are an accurate intuitive understanding. Such a digital design can greatly reduce production costs and provide high-quality test environment for product design.

2. Development trend of industrial digital product design

With the trend of economic globalization, the existing digital product design software mainly includes Microsoft Project and Visio. On development, domestic and foreign enterprises in the field of industrial design, digital design using mainly these two software. Computer Aided exchange is mainly use the way of Digital to make design communication, then use computer network technology to build networking platform. Foreign enterprises widely used internal mail system to engage in teaching and research, product design, design culture, psychology, design and computer-aided design and other aspects.
Digital design of industrial products developed mainly in the following areas, computer aided design reverse platform, network platform and several digital platforms, through these platforms it can be applied to the entire digital product design process and play the biggest role. As hardware technology continues to improve, the operation is faster, hardware technology relied by digital developed, more convenient to use freely without too much waiting, greatly improved the efficiency especially the design efficiency. Industrial products appearance and functionality designed primarily for industrial products, later in the design process, there will no obstacles in design process caused by the imperfections of hardware as in the past. Research on consumer industrial products, refined features of these products to find industrial products combining traditional culture and regional culture. Software features need more complete, more user-friendly, because too many software manufacturers are lack of cooperation and coordination at this stage, while the software itself has a lot of problems, a lot of software needs to be long learning, so we should research on consumer industrial products, refined features of these products to find industrial products combining traditional culture and regional culture.

3. Research on digital platform design policies and practices

On the basis of manufacturers continue to integrate and improve on the internet to fusion software and then built a new platform. So we need for appropriate design and technology to achieve integration between the two platforms. We have begun to use internet technology integration especially abroad, for example, after the purchase of hardware, using software secondary development, software redesign to make it fit for hardware, while taking advantage of coordination between platforms, will unify the design process. Therefore, the essence of digital product design platform is the enterprise to create a digital design and learning resource center, with the rapid development of information design, and its application in the entire design is increasingly wide and its role has become increasingly prominent. I think it’s only to manage the existing platform on a scientific and standardized way on the aspect of security architecture, digital repository and management system that can ensure the entire platform more stable and efficient operation. Simulation is users interactively manipulate three-dimensional product model, use the product resources to shape the characteristics of the product for online real assembly process simulation in the simulation environment, and analyze the characteristics of the assembly. But it must be carried out prior to the physical assembly operation, it can also be used to test the product of rational design and usability, in the detection process, by finding solutions to optimize processes constantly deal with the problem. Design the generated product is a series of operations by way of interaction on preparation of design line, the design division of resource allocation to the corresponding repository to the design line, the process of simulation module and its assembly simulation to detecting whether the set of design line with rationality, through constantly testing whether the ability of industrial art and design will meet the production requirements, to generate the specified file to guide to design digital platform. By cutting process simulation virtually, you can simulate the entire process including processing equipment,
machine tools, auxiliary equipment and the ATC. Further analyze the feasibility of NC code, to ensure the quality of NC.

The main contents of digital platform

1. Virtual Computer Aided Manufacturing

Both at home and abroad will carried out computer digital design and construction of digital platforms, use innovative digital design platform to carry out the actual design project. The ultimate goal of create innovative digital design platform is to carry out the virtual manufacturing of the actual product design. After use two-dimensional and three-dimensional software to product modeling operations, make internal design, then virtual assembly, on the one hand there is a real product modeling design, use of the established platforms, combined with the actual design of the project, will play the role of the platform. In the beginning of the project, it is incorporated into the platform, establish the design team, support with different sub-platform, solve problems in the different design stages. Top rational design, by the way of virtual assessment until design and assess stage, then produce and manufacture actually, it can save time and cost. On the other hand, we can understand the use of materials by virtual manufacturing, manufacture computer assisted virtualization assessment understanding, In the aspect of design evaluation, no longer as in the past that carry out after the product has been produced, it carry out at the design stage and use virtual design widely, thereby improving work efficiency.

2 Mode of operation

Mode of operation of industrial products digital design platform is virtual reality technology, short as VR. First virtual use, for example, annular projection, identify the law through the study of industrial product appearance and functional design, design three-dimensional product model combined with platform, which is a true reflection of product modeling, using sensor technology to design at the same time, experience in human-machine performance and method of the product to cut down the huge cost of design review. By the research of the method and digital technology, built unique industrial product innovation and digital design platform. This platform include 8 sub-platform, which are digital design program sub-platform, database design information, digital hand-painted performance sub-platform, computer-aided design sub-platform, computer-aided design reverse sub-platform, network platform and computer-aided assessment sub-platform, therefore it requires a combination of practical design projects with business cooperation to update and improve the corresponding sub-platform. Use of network technology to make a line of Internet and wireless networks, and structure of a new model digital platform on management and operation of infrastructure platform.

3. Digital platform resource sharing

Digital platform resource sharing is platform construction field use of modern information technology processing mode comprehensively and deeply to facilitate information transfer product about modeling design and sharing information and resources to build a new model to manage platform, promote comprehensive platform. Most of the existing digital platforms adopted the method of follow the development
of teaching, open to scientific applicability to realize a hierarchical model of development and economic principles, highly integrated digital platform to achieve an effective platform resource aggregation and broadly shared, personalized service platform construction, ensure that the query speed, protection of intellectual property rights and resources of interactive applications.

4. Feasibility of digital platform construction

In the view of economic development, integrated digital platform is the trend, industrial products digital design platform is also a product of China's rapid economic development as well as the continuous development of scientific and technological level, industrial design is also moving away from reality limiting factors to the digital design phase, but the first is the enterprise information, which is the integration means of information with computers, the Internet and other advanced technology. Industrial products digital design platform is to link the design process to each other with the integration of the platform, playing a role of saving time, improving efficiency, and reducing production costs. Existing business, production, production, and design and management in enterprise should provide accurate and effective data for the company's "three-tier system", which are the tactical, strategic level and decision-making timely to achieve enterprise’s business and management processes on line and make sure the management really get a complete and clear "message" in order to react quickly to the needs. Digital design platform consists mainly of digital design program platform, digital design platform, data collected platform, the performance of hand-drawn digital design platform, computer can make relative instructions online.

Summary

With the continuous development of science and technology level, industrial design gradually gets rid of the traditional design approach and develops towards paperless and virtual and network way. These are all foundation for the construction of digital platform. As the building of digital platform at the same time, industrial products digital design platform follows along the industrial product design process, relying on computer technology, building design platform from the hardware and software aspects respectively, It can greatly take the advantage of the integration of the platform to improve efficiency and cut costs. Integrate digital network platform, coordination at different stages of the design process, increase design communication, facilitate the design orderly, to improve production efficiency and increase the added value of industrial products at the same time. Through the analysis of digital platforms macro and micro, from the view of the current problems in the manufacturing, it is needed for innovative product design platform for digital. Traditional manufacturing industry is currently facing a transition, where are many problems performed as digital phase varies at different stage, there are problems of coordination and implementation in the design process of some stages, we need a unified platform to integrate it. Therefore, to achieve the construction of digital design platform is necessary and feasible.
References


