



Research on Higher Vocational Art Design Education from the Perspective of Key Information Technology Based on Cloud Design

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Abstract. With the development and progress of network information technology, the concept of “cloud” has gradually derived, such as being on some new computing service technologies of cloud services, cloud computing, cloud manufacturing. Among them, cloud design is a new type of product and service design born in this technological environment, which integrates cloud computing technology, cloud technology and three-dimensional digital design and manufacturing technology, and integrates these technologies and process clouds into a resource pool. Demand sharing means that companies can perform cloud testing to optimize their own resources, so that they can make full use of their own resources and realize their best economic efficiency. This paper analyzes what is cloud design, and explores the core technology construction of cloud design technology under the background of the current network era. The application of cloud technology promotes the innovation and reform of Higher Vocational Art and design education, and cultivates high-quality art and design talents who can apply new technology to innovative design.

Keywords: Cloud design · Key information technology · Construction path · Art design education

1 Introduction

In the new network era, network design is based on the Internet and information technology as the basis and carrier. It is an important and basic characteristic of the development

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of network design technology based on the “cloud” carrier. It also conforms to the needs of the progress and development of the times. A concentrated expression of a new Internet and information technology. At present, “cloud” terminal technology and network technology have been continuously progressing and developing, and its application in our production and life is increasing [1]. Therefore, from the perspective of the development of the Internet, the advancement and development of computer and cloud design technology provide a strong guarantee for promoting the innovation and application of network information technology. According to the training goals of art design professionals in higher vocational colleges and the corresponding job groups, cloud design technology can be used to define students as designers, building materials suppliers, project managers, cloud design platform developers and other different identities, tailored for accuracy nourish [2]. The application of cloud technology in higher vocational art design education is the inherent trend and demand for the sustainable and healthy development of my country’s future design industry.

2 What is Cloud Design

Cloud design is mainly based on cloud computing technology, which integrates the planning technology and planning process in the production and activities of human creations into a resource pool, which can be shared in real time according to the needs of users, that is, users can evaluate the design results through the network [3]. To optimize their own resources, so as to give full play to the best management functions. Common cloud design application platforms and software include: threeWeijia, Design Cloud, Tencent Cloud, etc. In the actual application process of cloud design, it has the following advantages:

- (1) Concentrate high-performance software and hardware resources to improve work efficiency;
- (2) Realize the collaborative work of project members;
- (3) Realize knowledge accumulation and management;
- (4) Unified management of data resources, safe and controllable;
- (5) Make remote office and project meeting presentation reports convenient and quick;
- (6) Reduce software and hardware purchase capital investment and save costs.

3 Key Information Technologies for Cloud Design

Cloud design can be applied to multiple design scenarios and environments, breaking time and space constraints, and transforming design work from pure offline to online and offline integration. The key information technologies of cloud design mainly include cloud technology, cloud computing and three-dimensional digital design, etc. Each technology has different functions and their core technology constructions are also different. It is these technologies with different dimensions and different functions that effectively promote the formation and development of cloud design.

3.1 Cloud Technology

Cloud technology can be regarded as a kind of hosting technology, which realizes the storage, calculation and sharing of data by integrating hardware, software, network and other resources. Its key core technologies are virtualization technology, distributed mass data storage, and mass data. It consists of management technology, cloud computing platform management technology, and programming methods [4].

(1) Virtualization technology

The main meaning of virtualization software technology is that the virtual computers and component devices in the virtual computer system can work normally on other virtual software devices. One of its main goals is that the software can greatly increase the storage capacity of virtual hardware and simplify the virtual software. The re-installation configuration operation process reduces the cost related to the use of other virtual hardware devices in the virtual software device, and can support a wider variety of operating systems at the same time. Through this kind of aggregation technology of underlying virtual hardware, the information isolation between software applications and multiple underlying virtual hardware can be easily realized. In the realization of cloud computing, the basic virtualization concept of computing system is the basic theory of all information services and network application architecture models used to build “cloud”.

(2) Distributed massive data storage

Cloud computing has strong computing and data processing capabilities, and is implemented through a large number of servers. Conventional storage methods can not meet the storage of massive data, so on the cloud computing platform, a special distributed data storage method is adopted. To put it simply, it means distributing design data such as dimensions, drawings, drawings, etc. to multiple servers, using redundant methods to decompose and inherit tasks. This not only ensures the reliability of the design data issued, but also can use low-configuration servers to save storage costs [5].

(3) Mass data management technology

The data processed by cloud computing is massive and distributed, which requires a management platform to process and analyze it. The platform not only has powerful computing capabilities, but also requires massive data management capabilities. This technology has good management capabilities for large-scale data uploaded by large-scale design projects, ensuring the integrity and accuracy of the design data.

(4) Cloud computing platform management technology

Traditional computers cannot process big data stored using distributed technology, which affects the data calculation and storage process of some cloud design projects to a certain extent. In order to solve this problem, cloud computing adopts a new type of computing architecture. Under this structure, the cloud computing platform has a huge number of nodes and servers. They need to coordinate with each other, work in a unified and effective manner, and also ensure the reliability of the entire system. This requires the cloud computing platform to be able to perform intelligent management.

(5) Programming method

The cloud computing programming system architecture uses a unique programming system model-map-reduce model. This new programming system model is actually a parallel-based programming system model, and the programming ideas are concise and clear. And through this programming method, better task scheduling can be carried out. For users, they only need to customize the Map function and Reduce function. The operation is relatively simple and saves a lot of programming time [6].

3.2 Cloud Computing

From a narrow perspective, cloud computing is a kind of distributed computing, which decomposes a huge data calculation into countless small calculations, and then analyzes and processes them with the help of servers and systems and sends the results back to users. From a broad perspective, cloud computing is not only a network technology, but also a network application concept. With the Internet as the core, fast and secure data computing and storage services are established on the network. The types of technologies involved are distributed. Type resource management technology, parallel programming technology.

(1) Distributed resource management technology

In most cases, the simulation system of the information system will be in a concurrent execution environment of multiple nodes for a long time. If you want to effectively ensure the accuracy of the system's operating state, you must effectively ensure the distributed data between the nodes. Consistency of transmission. In order to solve the consistency problem of cloud computing, many enterprises and researchers in the computer field of our country have put forward various agreements. These agreements are some laws that we need to follow. That is to say, before the birth of traditional cloud computing, the solution to the consistency problem of cloud computing still relied on many agreements, but for large-scale or even super-large-scale distributed network systems, it is impossible to be sure that all departments and subsystems can Using the same network protocol, there is no way to determine the distribution consistency of the network. This problem can be effectively solved. The distributed resource management technology in cloud computing applications has satisfactorily solved the problem [7].

(2) Parallel programming technology

The cloud computing model is a computing model based on parallel and programmable. In this parallel data programming system mode, some key details such as design data concurrent processing, fault tolerance, data distribution, load balancing, etc. are directly processed through abstraction and integrated into a system function library, through this unified function With the interface, users can perform size calculation and design task automation, that is, a system task is automatically divided into multiple independent subsystem tasks, and the massive calculation data of more users can be directly processed in parallel and effectively.

3.3 3D Digital Design

Three-dimensional digital design is built on the basis of graphic design and two-dimensional design, and is the basis of intelligent and networked design platforms, making the design goals more three-dimensional and visual. The core ideas and technologies involved in 3D digital design include standard modular ideas and associated design technologies.

(1) Standard modular thinking

Modularity refers to a period of sharp contradictions between the diversification and change of market demand and the sharp contradiction between product development and technological innovation capabilities, and the modular product development strategy of “changing with changes” and “changing with few changes” [8]. In other words, modularization is actually a standardized high-level form. Module usually refers to a mixture of various components or parts, with independent functions, can be constructed as a series of separately produced and manufactured standardized product units, which are formed by combining different types and forms of interfaces with other units. The products are separable, coordinated, and interchangeable. Modularization technology is based on various modules, and combines the advantages of various universal, serialization and combination integration, and is used to solve the standardized technical form of rapid adaptation to various complex systems. After years of research and statistical analysis, the results show that in the development of a new generation of products, about 40% of the time is reused in the past part design, and about 40% of the time is spent on all the designed parts. Modification, and only about 20% of the time is completely replaced with new parts. Through research and adoption of new technologies such as group technology, standardized management technology, and modular design of main parts elements, it is possible to standardize the production of 90% of the internal structural elements of the main parts, and standardize the production of 60%–70% of the main part elements. The main part elements of this part are produced and modularized. This part of the product standardization, standardization and the use of modular mechanical parts design is an important theoretical basis for the mechanical design of the design company’s series of products, and can be widely tailored for mechanical design practitioners to make professional choices. Once these similar parts are re-screened, they include digital production models, drawings, processes, production process codes, tooling, measurement and testing equipment, etc., which are currently achievable, and can directly redesign and manufacture similar parts. The total quantity is basically controlled between 10%–20%, which is very likely to greatly shorten the basic design and manufacturing cycle of similar products and the development cycle of product research institutes, and improve the overall production efficiency of products.

(2) Associated design technology

In a broad sense, data association design technology mainly refers to the construction of a fully digital three-dimensional collaborative system design data information processing platform and design environment system based on technical research and design as the main technical research core, solidifying the design and parallel

lean process based on the application of three-dimensional data collaborative system. The management operation process realizes various data association transfers based on design model-based 3D collaborative system design and lean process management applications, and improves the operation process of data structure design, the operation process of parallel 3D collaborative design data transfer and distribution, and the data running status. Optimize the operation process of monitoring and process control, the planning and design of various collaborative information processing processes and systems. In a development environment designed in a collaborative manner, the various design features (such as design parameters, geometric structure characteristics, etc.) in the upstream collaborative design development file user must be a design function file that the user can directly pass through the collaborative development (publication). To directly realize the mutual sharing of design information for downstream users of collaborative design development files [9]. And when there may be major changes in the system parameters or system characteristics that are released each time, the downstream system designer can also automatically re-implement the real-time update of the released data [10]. For example, when the structural parameters or structural features of a parallel skeleton design model change, the partial design of the parallel skeleton of all models is considered to be able to update the corresponding partial design of its model directly. The difficulty of the specific implementation of the related skeleton design is mainly reflected in the top-level structural planning and design of the product related skeleton design specifications of the structural boundaries and definitions, which mainly include the product skeleton design model and the structural boundary definition of the product interface, and sort out the various design professions. The actual operation management process, the boundary definition of the top-level product structure and professional organization, and the definition of the boundary of the skeleton design model.

3.4 The Key Information Technology Construction Path of Cloud Design

Cloud design is based on the “cloud” form of design work. It is different from traditional single and flat design software and methods, and tends to be more three-dimensional, informatized, intelligent and technical. The key information technology construction path of cloud design are depicted in Fig. 1.

Path 1: Cloud technology integrates network information technology, resource integration technology, platform management technology and other comprehensive applications of cloud computing mode to form a resource pool, and utilizes virtual technology with the help of distributed resource management technology and parallel programming of cloud computing. Calculate, manage and interpret the massive data uploaded and stored in the cloud in the cloud-designed server and system platform.

Path 2: Through the integrated technology and resource pool of cloud technology, reduce the expenditure and complexity of network technology, and realize the construction and listing of cloud design with the help of cloud technology and three-dimensional digital design. In fact, cloud computing and cloud technology are interoperable in terms of data storage, processing and programming. The organic integration of the two provides effective technical support for the development of cloud design.

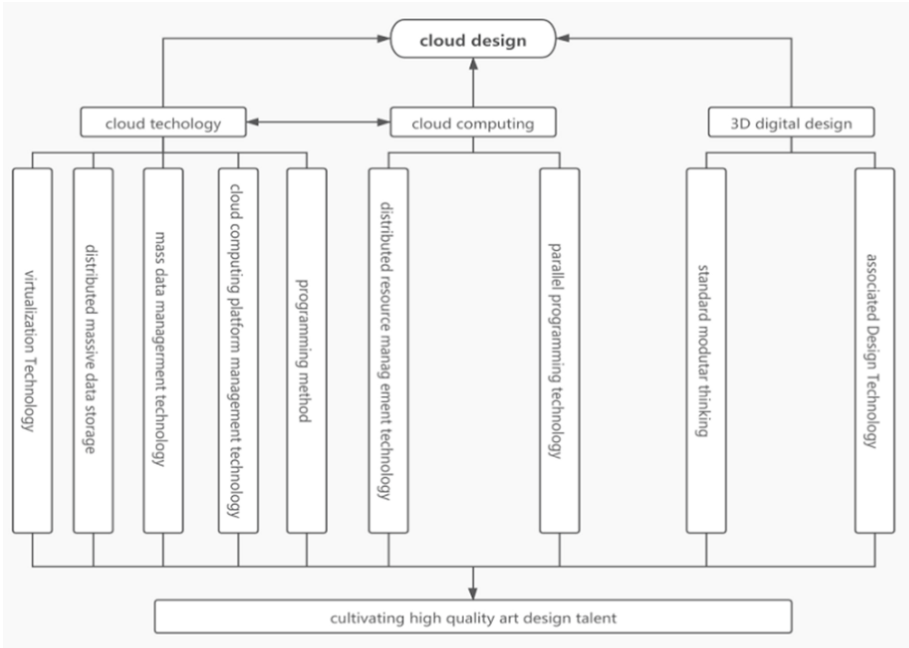


Fig.1. Cloud design key information technology construction roadmap

Path 3: Three-dimensional digital design realizes the three-dimensional design. The product or material to be designed is presented in the form of a combined model. In the whole design process, more attention is paid to the logical relationships such as construction logic and usage logic. And integrate standard modular thinking and associated design concepts into the data processing and storage programming of cloud technology and cloud computing, and promote the concept development and product launch of cloud design from the two perspectives of network technology and design thinking.

4 Higher Vocational Art Design Education Based on the Application of “Cloud Design” Technology

At present, enterprises use cloud design technology to realize information exchange, process control, data intelligent analysis, decision-making assistance and other functions through digital platforms, realize real-time digital collaborative management of supply, production, and sales, and complete digital management, digital manufacturing, digital marketing and digitalization. The all-round upgrade of the supply chain collaboration has established an integrated front-end and back-end system [11]. The formation of a complete data-driven enterprise research and development, design, production, marketing, supply chain management and service system, mainly through the following four links of innovation:

The first is to build a product personalized customization service platform: online confirmation of quotations, production orders and entering the platform's order management system, orders are automatically split and scheduled on the platform, and real-time data interaction with the MES system. After the production is realized, processes such as distribution and installation are automatically arranged. At the same time, establish a customer service bus, import CRM systems, call center 400, etc., to achieve real-time control and precise marketing of each link in the customer service process.

The second is to build a large-scale customization platform database: through the company's full-service information management, create a database of customer information, product design, product technology, and product services in the customization industry to provide support for the company's business analysis and decision-making.

The third is to build a digital workshop that supports large-scale personalized customization: transform and expand cabinets, baking paint, blister workshops and logistics warehouses, integrate MES, APS, SCADA, WMS, SCM systems, and introduce visual management to achieve kitchen Flexible and customized production of cabinet products. Collaborative manufacturing through the network realizes the unified scheduling of remote production capacity and supply chain systems.

The fourth is data asset management: collect business data from various sectors, external data, collect, store, calculate, and unify standards and calibers through the data center to form group data assets, support internal management decision-making, provide external value-added services, and support front-end business Innovation reduces the burden on the back-end system, helps the manufacturing industry drive the continuous improvement of data application capabilities, solves the problems in the use of data in various departments of the enterprise, and drives business innovation and development.

To meet the development and progress of information technology, especially the needs of the development of "cloud design" technology, the education and teaching of art design majors in higher vocational colleges should also be continuously reformed and innovated. Combining the needs of the company's "cloud design" position, "cloud design" should be opened. In accordance with the characteristics of "theoretical learning is not high and the practical ability is strong" in the art and design majors of higher vocational colleges, in the teaching of art design majors in higher vocational colleges, a "integrated course of theory and practice" is offered: theory The course mainly focuses on the cognition of the basic concepts and principles of "cloud design"; the practical course mainly makes full use of the school-enterprise cooperation training practice base, through enterprise practical teaching and the actual position practice of "cloud design", correspondingly to further promote students' The theoretical knowledge of "cloud design" is mastered, so that students' comprehensive ability level can be improved in an all-round way, and high-quality "cloud design" technical skills talents can be cultivated for enterprises.

5 Conclusions

The emergence and establishment of cloud design is conducive to the realization of the informatization of multi-mode design from industrial design and business design to the in-depth development of the Internet, intelligence, and service. It is the only way to

achieve the great development of design culture and the prosperity of the art industry. The road Through the construction of key information technology of cloud technology, promote the innovation and reform of higher vocational art design education, and cultivate high-quality art design talents who can apply new technologies for innovative design. Of course, like any new thing, the survival and development of Cloud Design will encounter certain arduous difficulties and twists, but as long as these environments are available, it will definitely be able to reach its glorious apex.

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