Research on Cooperative Information Platform of Mobile-end Ocean Engineering Based on Sview

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Abstract. With the rapid development of the informationization of ocean engineering, a large number of ERP and CIMS related software have sprung up. These software have excellent performance in the view of 3D digital and CAD conversion, but there is a clear lack of information synergy. The cooperative information platform of mobile-end ocean engineering based on Sview, which relies on the mobile-end is a unified platform of lightweight, cooperative design and manufacturing in different places, 3D model on-site browsing and timely feedback of information. This information platform which realize the upgrading and efficiency of enterprise production is used on the design and production of ocean engineering, increasing space and time utilization.

Introduction

With the rapid development of the ocean engineering, the informationization of the shipping industry has been developing rapidly. In the modern ocean engineering, we need to design drawings and build 3D digital models, and then on-Site construction. If any problems occur during construction, it is required to be modified by the design department which takes a lot of time and people. Existing software like ERP and CIMS, only has a single function. Although 3D digital models can be lightweight, and can convert CAD digital formats of different formats into a unified data format, it is still far from enough to meet the needs of the informationization of ocean engineering. The cooperative information platform of mobile-end ocean engineering based on Sview, which relies on the mobile-end is a unified platform of lightweight, cooperative design and manufacturing in different places, 3D model on-site browsing and timely feedback of information. At the site of the construction, we can use the mobile-end to view the large 3D digital models and on-site guidance, at the same time we can annotate the 3D digital model. This information platform which realize the upgrading and efficiency of enterprise production is used on the design and production of ocean engineering, increasing space and time utilization.

Cooperative Information Platform of Mobile-end Ocean Engineering Based on Sview

Cooperative information platform of mobile-end ocean engineering based on Sview is the loading platform for designing 3D digital model of products. Designers of different units can communicate with each other in designing products, which English abbreviation IAD (Intelligence Aided Design), Intelligence Aided Design. Its effective carrier can be the mobile-end (Smartphone, Tablet, Laptop), and it uses mobile phones, tablets and other mobile-end to assist the design and construction of ocean platforms throughout the life cycle of the ocean platform. This paper is introducing an example of the 400 foot JU2000E type ocean drilling platform built by the Malaysian coastal engineering co., LTD.

Lightweight

Lightweight is used to compress large modulus files by lightweight processing, and through the format conversion to achieve the function of browsing the digital files on mobile device. It expresses by compressing the super large-scale CAD 3D digital models in order to realize 3D visual browsing on the mobile-end. Also the components and assemblies of the products are presented in
SVL data format, to achieve a large number of modules browsing (as shown in Figure 1). Light weight has the characteristics of high security, high compression ratio of 1/10 and G-Class large-scale high-performance browsing.

For example, the 3D CAD model file size of the 400 foot JU2000E self-elevating ocean drilling platform is 10G, which can’t be opened by ordinary computers. It takes hours even if you can barely open it, and it's extremely inconvenient to browse. But, after 3D lightweight processing, a large scale CAD model can be converted into a 1GB digital file. It can even make the compression ratio greater than 50 times, this will reduce the file size to 1/50 of the original file size. In this case, the 3D model of 10G turned into 200 million, realizing browse on the mobile-end easily.

Figure 1. SVL data format.

Synergy

It usually requires several units of collaborative production to design for large ocean platforms such as the 400 feet JU2000E type jack up ocean drilling platform, producing a variety of CAD models. In addition, we also need to solve the problem of production assembly in different places. This software takes lightweight as the premise, supporting convert different types of mainstream 3D CAD models, such as PRO/E and Catia, to uniform SVL format files, keeping design and geometry information according to different scenes, which support for lightweight requirements for models such as ITEM and CAVE (immersive simulation). It makes easily for different unit designers to collaborate on this platform that we can browse on the mobile device (Mobile devices here mainly refer to portable mobile terminals such as smartphones and tablet computers) at the same time.
Live View

We can browse the design model of this platform to view the assembly site of ocean drilling platform by Sview at mobile-end, such as smartphones, tablets or laptops. For example, browsing the 3D design model of this platform, comparing and testing with real object. We can also browse the basic views, sections, moves, comments, etc of the platform, which supports the 500M level digital mode high performance browsing. In the future, we can also initiate meetings on mobile phones, to discuss the design problem of 3D digital module.

Compared with traditional field inspection, we can browse 3D models at mobile-end such as tablets and mobile phones, when the reference is converted into a 3D lightweight model based on a two-dimensional design blueprint or a Pro/E 3D model. This allows for easy browsing, saving time, and improving construction efficiency.
Figure 3. Comparison of product object and design model.

Figure 4. Mobile phone, tablet, computer, three screen interaction.

**Timely Feedback**

In the process of production, technicians are unable to keep track of production progress in real time, so they need to go to the site to make sure the production schedule, in order to make changes and sign confirmation of the AO (Auditor Office). This will consume manpower, material resources and a lot of time. Therefore, each department needs a complete information management system to achieve these effects: PDM graphic information, BOM list and plan information can be allocated in time, production schedule feedback in place and collection of on-site production situation can be delivered timely and in place.
And this collaborative information platform can update data by connecting the off-line mobile-end with computer and download the corresponding record form and 3D model. When the workshop assembly operation is carried out, the inspector calls the table to record the product data to achieve real-time collection of product data at the product data collection point. It can shorten wait times to the shortest that the problems and opinions in the actual production process and the progress of the job can be promptly feedback to the corresponding design and planning department, which the work efficiency and management level of ocean platform construction can be improved. Lightweight browsers can grab the image information of each angle of the digital prototype by taking pictures while browsing, and send the place that needs to be changed to the designer by comment and photo. This can also increase productivity.

![Image](image.png)

**Figure 5. Feedback figure.**

### Summary and Expectation

The cooperative information platform of mobile-end ocean engineering based on Sview is used on the design and production of ocean engineering, increasing space and time utilization. The cooperative information platform conducive to improve production efficiency, improve the efficiency of information transfer feedback and enhance the coordination of each station link from the point of increasing efficiency and reducing cost. From the production process, it can make the information reach the corresponding station in time and produce the required products as needed when necessary, thus reducing inefficient production processes and links. At the same time, The software assist production design and processing manufacturing, to achieve the use of electronic drawings instead of wood fibers made of paper drawings, boosting the paperless process of the construction of ocean platforms, which will also greatly reduce the production of paper in the workshop. On one hand, the cost of production is saved, on the other hand, it meets the requirements of green production. From time and space, the useless labor and time will be eliminated, so we can improve productivity.

The cooperative information platform of mobile-end ocean engineering based on Sview can reduce manpower and material consumption from time and space, which led to a real increase in productivity. Of course, there are still imperfections in this platform, such as further development of a professional custom system is required. Using the platform to unify the design principles of each design institute. Process technical documents are issued to each manufacturer, at the same time, we hope that the manufacturers will provide technical information to the design institute. Beside, broaden the scope of application. Such as, we can extend to the yacht direction and building the 3D model database of yachts, so the customers can find the relevant products of technical maintenance information on the platform.
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Reference


