

Quality Information Management System Under Collaborative Environment

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Abstract. Under collaborative environment based on PDM, the coupling of information between PDM and QIMS makes the development of QIMS complicated. During constructing cooperative circumstance, the development of QIMS can be simplified through fusing rules of quality control into the processes managed by PDM. On the other hand, since the joint model of processes managed by PDM is equivalent to the virtual product model in the collaborative environment, QIMS can also reach quality objectives of enterprise by controlling the quality view of joint model. On the basis of the quality view, an integration model between QIMS and PDM is designed to achieve the combination between quality management and process management by information integration and interface.

Keywords: collaborative environment, PDM, system integration, quality information management, distributed system.

1 Introduction

A Quality Information Management System (QIMS) cooperating in harmony with collaborative design environment, which supports share of information and task collaboration between different software tools used within enterprise, can ensure that quality objectives are able to be reached better. Contrasted with other general quality information management systems, which are major in studying the professional field of quality management and do not pay enough attention to the collaborative environment in enterprise, its development is more complicated because it is not a disintegrated system but the part of collaborative environment.

This paper focuses on the development of QIMS under the collaborative circumstance based on PDM (Product Data Management). First, a appropriate plan of developing QIMS is presented by analyzing the characteristics of PDM and QIMS, Second, a integration model is designed under the plan guidance, Finally, according to the plan and integration model, a Web-based distribute QIMS is developed in a ship enterprise.

2 Development of QIMS Under PDM Environment

In general, PDM is used for the fundamental platform of collaborative design environment in enterprise. Because PDM has the powerful capabilities of data

management and process management, many simulation and design tools are integrated into it to describe all details on processes and technology of product design in enterprise, which is called virtual product model. It seems that it is possible to control quality of product through managing quality of virtual product model in enterprise, as also is the motivation of developing QIMS. In other word, the key to developing QIMS under cooperative circumstance is that how to extract the quality view from the virtual product model and then to control it.

As the two features of PDM, data management is the basic function, and process management is the core function. Especially, the virtual product model is described relying mainly on the process management. Besides, it is more important that the powerful ability of process management is very fit for one of primary principles of modern quality control—Process Method, which emphasizes that any kind of activities in the course of quality control including the management of quality information should be accomplished in some processes.

Today, actually, the combination of quality management and process management is not only a possibility but also a tendency. To accomplish this combination, a common way is to fuse rules of quality control into these processes managed by PDM. But since the implementation of this way demands coordination and cooperation of all departments and various professional groups in enterprise, it is often performed during constructing the collaborative environment through separating from the development of QIMS to minimize interferences between PDM and QIMS and.

On the other hand, PDM manages these processes by controlling their joints generally; therefore joint model of processes management can be seen as the equivalent of the virtual product model. Accordingly, the quality objective of virtual product model can be reached by controlling the quality view of joint model on processes. Thus, according to the characteristic of quality management of enterprise, the quality view extracted from the joint model becomes the foundation of the information model on the development of QIMS and the interface model on the integration between QIMS and PDM, and then on the basis of these models, an appropriate integration model can be designed by adopting some effective methods.

3 Integration Model of QIMS and PDM

The integration between PDM and QIMS is able to be achieved in two ways including application encapsulation and interface, which are adopted in different situations. When users operate other application systems under collaborative environment, they only want to query and browse some quality information sometimes. In such case, encapsulating the application of QIMS in PDM platform is very convenient because the QIMS can be activated directly according to user's request; but, for the second case, they have to submit some problems on quality to loop them sometimes, and then it is inevitable to communications between PDM and QIMS which include two courses, one is that information is transferred to the database of QIMS from the database of PDM, and another is inversed. In this condition, the interface is very effectual because it can be performed automatically in the background. In fact, the integration also can be accomplished by the addition way—compact integration, but which is not fit here