

# Analysis on Critical Factors for PDM Success Implementation in Chinese Tobacco Industry Enterprise

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**Abstract:** Product data management (PDM) has been widely used to represent an advanced management ideas and methods, to bring significant changes to the enterprise product management. In this paper, describes the core idea of the PDM system and the challenges for the implementation in tobacco industry enterprise. Then in accordance with the implementation of PDM system, analysis and summarizes the critical factors affecting the implementation of the project both in management and technology aspects for tobacco industry enterprise, and to provide help for the enterprises follow-up the implementation of PDM system.

## Introduction

Product data management (PDM) is the management of all product related information and process technology. PDM system through the computer network and database technology, manage the production process in all product-related information and process integration for unified management, to make the product data in its life cycle, the latest consistent and safety for engineering and technical personnel to provide a collaborative working environment. To shorten product development cycles, reduce costs and improve quality to gain competitive advantages for enterprises [1,2]. From the point view of management, PDM system can coordinate and organize the entire product life cycle such as design, approval, change, work process optimization and product release. PDM connect with every stage of the product life cycle, and it is the bridge between to design and manufacture of information flow and production management. Along with the application and popularization of CIMS engineering, concurrent engineering, agile manufacturing, PDM system has been in quite a number of enterprises has been applied [3,4,5,6].

At present, from the point view of PDM system implementation in actual situation, the early stages of the project implementation the effect is very obvious: centrally manage data improve the safety and reliability for product data; enhance the product data information sharing between different departments of the enterprise to avoid the product data in each department or system repeat entry or redesign [7,8]. However, all the circumstance of the enterprise are not all the same, enterprise itself is also evolving, some enterprise in the implementation process of PDM project too eager for quick success and instant benefit, do not pay attention to the important overall planning and some basic problems, therefore, hinder further promote the application of the PDM system or even doubt the practicality of the PDM system.

Product data management is not the general sense of the application of information technology and innovation, but with higher levels of management revolution, the success of PDM system implementation requires fusion PDM technology knowledge and specific enterprise with its specific business knowledge. In recent years, the Chinese tobacco industry enterprises began to implementation of PDM system in enterprise promotion. How to make the successful implementation of the PDM in the tobacco industry enterprise for improving enterprise management, improving the research and design management, enhance the comprehensive competitiveness of enterprise is an important topic in front of the tobacco companies.

According to the PDM system the success of the project implementation in Zhejiang tobacco industry enterprise, this paper summarizes and analyzes the PDM system in the process of implementing the critical factors, in order to be able to subsequent enterprise implement PDM system provides practical reference.

### **The core of PDM**

Product Data Management inherit and develop the core idea of CIM technology, under the guidance of concept in system engineering, describe the concept of the overall optimization of product design data and design process, to standardize product life cycle management and to maintain consistency and traceability of product data. The core idea of PDM is the orderly design data, design process optimization and resource sharing through three balance of people, process, technology, virtual manufacturing process so that further productivity gains. Mainly includes the following four aspects:

(1)Support mass customization requirements

Through PDM system construction, to satisfy the business enterprise mass customization production mode, the product management is no longer limited to the formulation of the product design, drawing and document management, has been expanded to include user customization, product development, design, manufacture and sales, operation and maintenance.

(2)Fusion project management pattern

PDM system has advanced workflow control and project management tools to achieve timely, dynamic project management.

(3)Support concurrent engineering

Product data management system support a Web technology, can take full advantage of Web browser technology provide support enterprise, information, and process control integrated.

(4)Establish scientific knowledge management system

The PDM systems take advantage of knowledge representation and rule engine to achieve unified manage generalized model to solve the problems existing design knowledge dispersed in the personal mind, various tools, environments and systems cannot be unified management and reuse. Innovation-oriented enterprise knowledge systems from the design process by strengthening the coupling between processes and data to achieve knowledge extraction, filter, analysis and reuse.

### **The main challenges of PDM implementation in tobacco industry enterprise**

At present, tobacco industry enterprises through continuous development and construction, and formed a unique mode of management in product development management. However, from the process perspective, a variety of information is not effective to communicate with each other, cannot achieve the collaborative work requirements; from the product data point of view, the lack of data a reliable, the latest, most accurate and most complete source of product information. Therefore, PDM system in the implementation of the tobacco companies face major problems are as follows:

(1) Imperfect product design and management processes;

(2) Lack of effective means of control for product design and change;

(3) Poor traceability of the overall product development process;

(4) Low degree information sharing and knowledge reuse;

(5) High requires about the integration of information in enterprise systems.

### **The critical factors for success PDM implementation**

From past PDM implementation experience can see, the successful implementation of PDM largely more depend on the implementation methodology and process, rather than the technical aspects [9,10,11]. In the implementation process of PDM system in tobacco industry enterprise,

must to take full advantage of the PDM system and consider the management and technical factors in order to safeguard the successful implementation the system.

### **Management factors**

#### (1) Full support of the senior management

PDM system likes the ERP and MES system, is one of the core system belongs to the enterprise information construction, must be get the full support of the senior leadership in the process of building. If senior management cannot be fully understood aware of the purpose of the PDM system implementation as well as the potential risks, and would not have sufficient resources to the implementation of the project. And the implementation process involves many departments, links to a variety of major decisions on the implementation of the project requires senior corporate investment, causes the all employees of the enterprise are aware of PDM system implementation is the beginning of revolution for enterprise research and development management. Don't get senior management of the enterprise absolute support is one of the most important reasons of management information system implementation failure.

#### (2) Scientific planning and implementation methods

PDM system implementation requires the company to determine the strategic objectives of the product management, and the goals, expectations are clearly defined. According to the enterprise business goals, long-term strategic planning and the actual situations to make the overall planning, framework description and blueprint design of system construction, and then, to develop technology strategy and implementation strategies for the enterprise. Above all, in the specific system implementation process must be clear project goals and set reasonable expectations, using the scientific methods to ensure a variety of needs, technology and methods can be achieved in controlled, manageable condition.

#### (3) Sound project management mechanisms

The implementation of PDM system is enterprise management system engineering, with the features of complex, difficult and long life cycle of the application. Therefore, enterprises must proceed from the perspective of system engineering and scientific management in system implementation process; establish a sound project management system and operation mechanism, to ensure the successful implementation of the project.

#### (4) Give full play to the key users

The enterprise business people as key users to participate in the construction of the PDM system, the main role is to help the consultants understanding of the business knowledge, co-design, and feedback test results and take charge in end-user training. In this process, the key users both to play business scene designer, but also as a user to verify the system, plays an important role in the implementation of PDM system. Therefore must give full play to the role of key users, embodied as the hub of the associated parties, to integrate the PDM knowledge and the enterprise specific business practice, to ensure the quality of the system, to promote the transformation of the relevant processes and successfully to the end-user level.

#### (5) Data specifications and accurate

Standardization, consistency and accuracy of the data are the basis of the successful implementation of PDM. The experience shows that success lies in the implementation of the PDM system of data, process and personnel. Thus enterprise to establish standardize business processes from a global perspective, unified data description and interface to establish data standards management system.

#### (6) Adequate and effective communication management

There are two main aspects of effective communication management for the implementation of PDM , one aspect must be mutual understanding and close cooperation between the implementation of party and corporate, Only in this way, the party of implementation in order to in-depth understanding of the business, be able to fully on the corporate management improvement measures recommended and technical support. On the other aspect, the enterprise internal needs sufficient communication. The implementation of PDM system throughout the enterprise product design, production, and other important aspects of the project will involve many departments in the

enterprise; therefore, enterprise internal communication becomes very important. Full comprehensive, good internal communication can greatly improve the decision-making as well as the efficiency of dealing with problems.

#### (7) Continuous system training

Attention and carry out continuous training of employees is an essential link assurance system successfully running. PDM system construction and use will greatly change the existing operational processes and ways of working employees. Use advanced, effective management ideas and methods, not just the use of the system, but also the change means of the management philosophy. Therefore, in the implementation process, continuously relevant staff training, staff applications to solve a comprehensive knowledge and understanding of enterprise product data management issues, in order to better enhance the system suitability.

#### **Techno factors**

PDM system is a software framework, which provides an integrated environment in every aspect of product development, production, sales management, data and process management and controls. PDM system to achieve the integration and control, need to address a number of key technologies, such as network technology, database technology, and application software interface technology, functional expansion and updating of technology. To support PDM meet the current needs of the existing enterprise applications, and adapt to the enterprise management mode changing, expanding and updating applications requirements, so that enterprises in a relatively fixed working environment to handle changing objects and affairs.

##### (1) The scientific process construction

From the view of the PDM system development process, in fact, PDM range used in the product research and development process increasingly broad process. Until now, PDM can from the initial concept design until the final product recovery, able to carry on the management. In this process, in addition to the function of the PDM system, the most important thing is the process. Product design process has goal, inherent, holistic, dynamic, hierarchical and structural characteristics. Therefore, in the tobacco industry enterprise PDM system implementation process, in accordance with the ISO9000 standard construction management, enterprise product development processes standardization and optimization. Using hierarchical way to combine requirements, program flow and design flow, create a standardized design process. Comprehensive management and recycling management method are the introduction of the existing decentralized design process to realize enterprise product design process management system based on the process of engine and design of the support of the library.

##### (2) Product structure management model

The product structure management mainly manages products and the composition of information management product structure related operations, responsible for the creation of the product structure, browse, edit, etc. Detailed records of the process of enterprise products, including new product development, evolution and change of the sample trial, pilot evaluation and production version evolution.

The product structure management is usually the product structure tree reflects the hierarchy between the product composition and affiliation, and its essence is the product of the schedule. Therefore, PDM associated with the product structure tree to express and manage product structure and product configuration information. The product structure tree to express through the product structure semantics of objects and products associated objects. The product structure model created in the system shown in Figure 1. The root node is the cigarette product, and the rest of the node constitutes a sub-object of products. Child objects, including leaf tobacco, cigarette materials, flavor materials and process parameters standards. So product structure model to complete the expression information for each node, create favorable conditions for the product configuration.

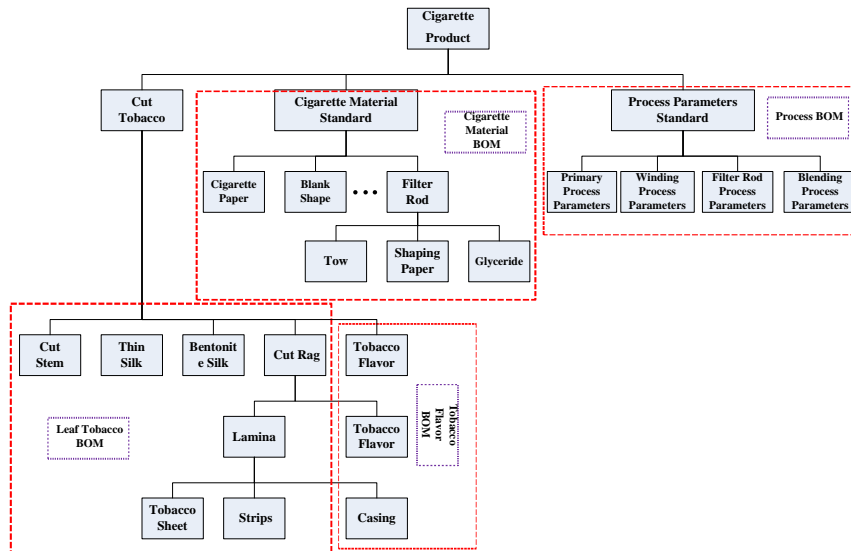


Fig. 1 Product structure model in PDM of tobacco industry enterprise

(3) Enterprise information systems seamless integration

PDM system integration mainly includes the operating environment integration, information integration, functional integration, technology integration, and integration of people and organizations. The information integration is the core of system integration, which the key is the integration of people and organizations; operating environment integration and technology integration determines the technical level, operating efficiency and life cycle of the PDM system. The integration of function will directly influence the management and production quality and efficiency. Therefore, in the tobacco industry enterprise implementation of PDM, SOA architecture and the SAP XI enterprises bus technology to realize PDM system and ERP, MES system effective information integration, and achieve the data sharing, accuracy and real-time [12,13].

**Conclusion**

The implementation of the product data management system is a huge system project involving management and technology, enterprises in order to be successful and not easy. The tobacco industrial enterprises in the implementation of PDM system should be comprehensive consideration of various factors, formulation suitable for the enterprise implementation of programs to ensure the smooth implementation of the project. This article briefly describes the core PDM system management thinking, according to the tobacco industry enterprise actual implementation of PDM system, from both management and technical aspects, focusing on summary analysis the influence of the implementation of the PDM system project successful key factors. We hope to be able to provide some help for those who are ready, or have begun to implement the PDM system technical staff and enterprises.

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