Attempting to reform business processes with PDM (Product Data Management), for "visible management" and speedy product development

AV Company, Home Electronics Group, Sanyo Electric Co., Ltd.

Sanyo Electric Co., Ltd., produces a wide range of electric products from solar power generators to digital home appliances and white goods, and is one Japan's leading electronics manufacturers. One of Sanyo Electric's, Home Electronics Group companies, AV Company (referred to as Sanyo Electric AVC below), embarked on a reform of business processes in order to realize "visible management" and speedy product development. Sanyo Electric AVC is a developer and manufacturer of AV products. It commands a large share of the global market in color TVs, and a large share of the domestic market in LCD projectors. Hewlett-Packard, by making use of its own experience and expertise as a manufacturer, supports Product Data Management (PDM) as a base for creating business processes which easily adapt to change. The business strategy of Sanyo Electric AVC, combined with the HP's service and knowledge on the IT, has led to a best practice for enhancing competitiveness in the manufacturing industry.

Challenges for the Customer

The economy and environment coexisting in harmony Doing business with an aim for a sustainable society

A prosperous and civilized life is the wish of mankind. Businesses try to provide goods and services for the range of people's needs, to fulfill this wish. Meanwhile, people's lives and business activities take a toll on the global environment, through the consumption of energy, resources, chemical substances, etc. Faced with this contemporary situation, Sanyo Electric Co., under its corporate slogan "We love people and the Earth," has developed its business globally, with an aim of realizing a sustainable society in which the economy and environment are in harmony.

Sanyo's business covers three major areas: in the area of "Clean Energy (Energy & Ecology)," it develops eco-friendly products by making use of solar power generation techniques, etc.; in the area of "Multimedia (Digital & Devices)," it provides "fun, excitement and sensations" by means of its digital technologies; in the area of "Total Lifestyle Solutions," it seeks to offer a best lifestyle solution by integrating the two areas above. In order to promote these enterprises, Sanyo has adopted a business group system composed of various business units, thereby aiming to enhance its business worth through increased specialization and the reinforcement of all-round abilities. Sanyo Electric AVC is the core business unit in the Home Electronics Group, the specialist group in "Total Lifestyle Solutions"; it develops and manufactures such products as color TVs, which command a large market share overseas, and LCD projectors, whose high-end industrial models in particular hold a large share in the domestic market.

Initiating reforms on business processes Aiming for a "visible management" and speedy product development

Sanyo Electric AVC, whose major products include color TVs, LCD projectors, and plasma display panels, is positioned as a leading company in the market. However, competition in the market has intensified, due to the rise of burgeoning Chinese manufacturers and market participation by domestic companies anticipating an increase in household demand. As a result, the cycle of product development has shortened considerably, and prices have fallen sharply, which makes it more and more difficult to be at an advantage in the market for any great length of time. In response to these market changes and to improve customer satisfaction and maintain profitability, in June 2000, Sanyo Electric AVC launched a project of reforms for business processes, with an aim of realizing a model for "visible management" and speedy product development. A great endeavor to build a manufacturing business model for survival in the 21st century was thus set in motion.

In more specific terms, (1) by cutting by half the lead-time between planning and shipment, and by making weekly schedules for all operations, Sanyo Electric AVC tried to establish a system of business operations close to the customer; (2) by adopting a real-time earnings management cycle and keeping a detailed record of all the costs required for each product from its development through to its final production, the company tried to realize an autonomous management and to reform the earnings management structure.

According to Mr. Toshiyuki Haga, a member of the Group for Structural Reform (Management Strategy Unit, Planning

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and Administration Office, AV Company, Sanyo Electric Co., Ltd.): "Through a series of reforms, by reducing the number of missed sales opportunities, we hoped to increase sales, lower operational costs, and make for a smoother cash flow, thus creating a business model that maximizes profit for the business as a whole. In order to achieve this, we set five processes as themes based on the value chain of our business activities, and started a project for business reforms."

The first target of the project was the process of product design and development. In the product design to sales process, revisions in the upper reaches of the flow have a greater impact on operations further down. For this reason, reforms in the design and development process are of great importance. The second target for reform was the sales/distribution process, which is important for accurate judging the demand for a product. The third target was reforms to the supply chain process, and the fourth, to the service process, including invoicing and after-sales service. The fifth target was to establish a business management that provides revenues and expenses for each of these four processes and which is linked to cost management.

Information sharing and concurrent engineering are indispensable for improving the efficiency of the design and development process, the key to reform. Initiatives for PDM were launched for the purpose of laying down a basis for reforming this process.

HP Solutions

Based on its own experience and expertise as a manufacturer, Proposing reforms from the upper reaches of the product design and development process, the core of the entire operation

In May 2001, Sanyo Electric AVC chose HP as its partner for the promotion of PDM. The following are Mr. Haga's comments on the reasons for choosing HP as the partner: "As a global manufacturer, HP had set out to introduce reforms of its own organization using PDM, and had successfully reformed such business processes as the design and development of computer systems and printers. We valued this achievement highly, and thought that HP would be able to understand our actual situation and our ideals; and, backed up by its own expertise and experience, share with us the burden of filling the gap between the two."

In introducing a new solution into the design and development process, it is of vital importance to understand the background for which the process has become what it is, and demonstrate what it should be against this background. HP, having participated in introducing PDM into various manufacturing firms all over the world, including itself, can offer as an IT service its expertise on PDM based on its own experience.

Of the many PDM projects, we will focus here on the PDMs introduced to reform the design and development process. PDM has two roles. One is its role as a key solution for the introduction of a SCM (Supply Chain Management) system. PDM has often been introduced ahead of other reform projects, for the smooth transition from an existing system to the SCM system, and for the data-cleansing of BOMs (bills of materials) and the master computer system, both of which serve as the basis for production plans and management. PDM's other role is as a platform for the reform of design and development operations. In this role, it functions to unify scattered information on products and parts, and it supports various reforms in the design process.

"In the PDM project, we had a vision of creating an environment in which seamless collaboration among different divisions could be achieved through the unified management of information preserved in electronic form, and we tried to build a model for concurrent product development. There were four goals for the project: shortening the design period, improving the design quality, reducing the design cost, and developing human resources through information sharing. In order to attain these goals, we adopted and systematically organized the following five procedures: management of the master computer system, measures to cope with the new core system (transition to a weekly production schedule), development management, outcomes management, and the management of revisions to the operations." (Mr. Haga)

In this way, disconnected or partly overlapping pieces of information, which had been held separately, would be able to be put together and shared through the implementation of PDM (see the following figure). In the future, since the accumulation and utilization of data would be incorporated into business processes, and correlations be drawn between them, control would become possible. Thus, in the first step of our PDM project, BOMs were to be restructured so that design information might be used more effectively; in the second step, data and business operations were to be integrated with the help of SCM; then, in the third step, knowledge and information were to be shared through documents and collaborative relationships created through PDM.

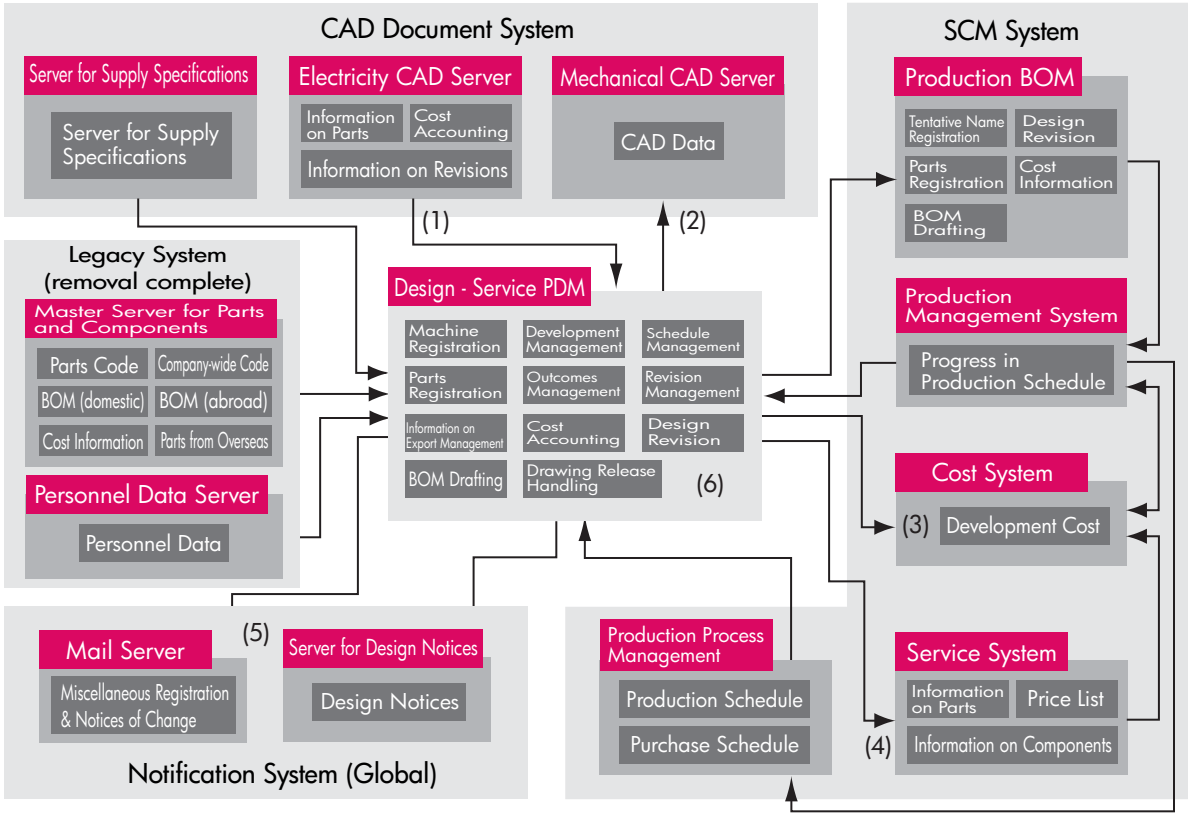
Project support from the 3 perspectives of "reforms of business processes," "reforms of people, the organization and mindsets," and "computerization using IT"

Guided by its experience as a manufacturer, HP began consulting from the upper reaches of the process in order to lead the PDM project to success, and backed up the project by endorsing (1) reforms of business processes; (2) reforms of people, the organization and mindsets: and (3) computerization using IT.

With regard to the reforms of business processes, HP proposed, on the assumption that effective SCM would be implemented in future, a business operation model in which business flow, business rules and data flow are linked. In revision management, which is crucial in the management of the design process, the method of ECR (Enterprise Change Request) in CM II (Configuration Management II) was adopted. CM II represents the best industry practice for the management of documents related to products and processes, and defines the procedures and steps for revising such documents. Following the principle that a balance is to be kept between quality and profits in every revision, product design revisions were evaluated against the product's guaranteed quality, and handled according to certain rules and procedures.

Since reforms of business operations necessitate reforms of people, the organization and mindsets, HP also advised about the inevitable confusion and obstacles involved in transition. Emphasizing the importance of preparation (Management of Change), HP also promoted public relations for the PDM project and edifying activities for the key figures in the project, helped to create a favorable framework for change, and offered support to make the system accessible to users. Since HP is well acquainted with the management of change within its own organization, it has been able to provide measures to ease anxiety

Sharing of design and development information achieved by the introduction of PDM



(1) Design revision by CAD becomes possible, guaranteeing consistency between the BOM and CAD.
(2) Since no inconsistent data is generated within the PDM, confusion no longer arises further down the process.
(3) Development management makes it possible to understand development costs.
(4) Price lists are created automatically.
(5) Weekly outputs, ECR, revisions to development management, etc., are immediately emailed to those concerned.
(6) A range of design information, mostly on BOMs, is preserved, so that it becomes easier to access data for analysis.

and resistance to new arrangements, and assist in the smooth transition to the PDM system.
With regard to computerization using IT, HP pushed the system development project forward by adopting the increment-and-spiral method. The spiral model of system development, which attains the final goal by creating and repeatedly reviewing a certain prototype, combined with a reform through the gradual improvement of job processes which adds new functions one by one, contributes to a steady transition to new arrangements. In conjunction with other reform projects, the method adopted by HP, then, is the one most suited for a system development carried on in the middle of a changing environment. eMatrix was adopted as the PDM product, and arrangements were made so that an approximate overall schedule for the flow of development management could be made on eMatrix.

Business Benefits

Significant effects in costs being reduced from labor savings using PDM and quality, costs and delivery times being improved by information sharing

As a result of these efforts, the first version of the PDM system was complete in July 2002, and in May 2003, it was linked to all of the new systems. Sanyo Electric AVC measured the investment effect of the PDM project in terms of reduced costs (Hard Benefit) and added values (Soft Benefit). Reduced costs are measured by the cost reduction achieved by labor savings, while added values are the estimated improvement in QCD (Quality, Costs and Delivery Time) made possible by information sharing.
"We classified the effects of the PDM implementation into following categories: effects of the revised platform for BOMs (automation, improvement in data precision, data-cleansing), effects of sharing of various outcomes (CAD links, outcomes management), effects of development management (making the project visible), effects of reduced design revisions (revision costs, mold repair costs). Revision of BOMs, by itself, would have had only one third of the total effects. Adaptation to the new business operations will hopefully have greater effects." (Mr. Haga)
Sanyo Electric AVC has succeeded in introducing a PDM system. The major issue for the future is to progress from an administration of design information to that of management information, by promoting concurrent engineering using modularization developed on the PDM platform, and then by effectively utilizing the data obtained from PDM.
"There is no end to the reforms of design and development operations. To carry on lasting reforms, it is of great importance to reform the mindset of the designers, so that they can see things from the viewpoint of the company as a whole, without being hindered by sectionalism." (Mr. Haga)
Sanyo Electric Co., world leading manufacturer with a long tradition, is now working for reforms of design and development operations in order to adapt swiftly to the rapidly changing environment of the 21st century. Sanyo Electric AVC, now equipped with the PDM platform to serve as the base for reforms, is always endeavoring to improve and consolidate its business processes. HP will keep supporting this challenge.

Implemented Hardware

HP 9000 Server rp5400 Series
HP StorageWorks Disc Array XP128

Implemented Software

eMatrix
Oracle

Implemented Services

HP PDM Construction Project

Challenges for Sanyo Electric AVC

- Creation of an environment where seamless collaboration is achieved among divisions, through the unified management of design and development information
- Shortening of the design period and improvement of design quality
- Reduction of design costs and development of human resources achieved through the sharing of information

Solutions Provided by HP

- Support for the construction of a PDM system
  - Support for drawing up the grand design and roadmap
  - Support for drawing up the computerization strategy
  - Support for business reforms through the analysis of design/development and materials procurement
  - Structural design for an information system
  - Construction of a PDM system
  - Construction of a database for BOMs and information on parts
  - Support for the introduction of CM II (Configuration Management II)
  - Support for the introduction of KPI
  - Support for Management of Change

Results Derived by HP for Sanyo Electric AVC's Needs

- Construction of a PDM system which serves as an information sharing platform for the unified management of design and development information
- Supply of master data for newly installed core systems, such as the SCM system
- Cost reductions achieved through labor savings under PDM; and QCD (Quality, Costs, Delivery Time) improved through the sharing of information and the embedding of operation rules

Please direct inquiries to the Customer Information Center at

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