NEC Global Business Process and IT Innovation Project «Stage 2»

Strengthening global competitiveness through global SCM reform based on the standardization of business processes and systems

Challenges

- The separate management of business processes and systems involved in production across the Group's businesses was "shackling" the process of strengthening global competitiveness.
- Due to differing business processes and production management systems in production, production adjustments could not easily be made between different locations.
- The absence of integrated processes that span sales, production and logistics had led to inefficiency and prolonged lead times.

Solution

- A standard system that would be commonly used across the business was developed to support production business processes, based on "IFS Applications", an ERP package with the strength to support production management.
- In order to support a pull-model production system, a system to connect the sales management with the plant seamlessly was established and coordination between the MES and Kanban systems was also developed. This enables efficient production with a short lead time that is synchronized with delivery.
- The "Obbligato III" PLM system was used to develop a Design-Manufacture interface to connect design with production. Engineering changes can now be rapidly and flexibly reflected in the production process.

Results

- A group-wide basis was established for the standardization of production business processes and systems.
- The increase in the transparency of customer and shipment information for the products being produced at manufacturing sites led to each responsible staff member being more conscious of customers and delivery dates.
- NEC will continue to implement ubiquitous manufacturing that ensures optimum production on a global scale and is not restricted by geography. To achieve this, we will continue to promote the standardized processes and systems in the future, to be adopted at both domestic and international production sites.

Introduction

The NEC Group embarked on a Global SCM Reform program. At its core, this program involves the standardization of business processes and production management systems, but it also considers the global spread of "customer-oriented manufacturing". Stage 1 entailed the implementation of a reform of production management systems for the IT platform business with a core focus on NEC Platforms at the head factory for computer production. Together with the further strengthening of a production system to support the customer-oriented pull-model production method, this also led to the establishment of a group-wide foundation for the standardization of production business processes and systems. In future, NEC will continue to expand "ubiquitous manufacturing," enabling production of identical products at any factory around the world.

Challenges

The NEC Group produces and supplies the market with a broad range of products, from mobile phones, PCs, servers and storage, to submarine cables and satellites. Each NEC business division deals with products that have completely different forms of production, from mass-produced products for consumers, to design-to-order system products. Each factory and affiliated company has therefore cultivated its own production business processes and corresponding production management systems and expanded the business.

"The separate management by each business of business processes and systems involved in production across the group had created a considerable "obstacle" that was slowing down our plans to strengthen our competitiveness in the global marketplace further," said Koji Saga from NEC Platforms IT Strategy Headquarters.

Saga also adds, "From the point of view of the BCP, we must implement the concepts of "continuous production" and "it can be made anywhere," even if unforeseen circumstances arise. We also need to be able to flexibly adjust our production sites according to fluctuations in demand for products. However, since our production business processes and production management systems have traditionally varied, we have not been able to achieve this kind of "perfect world scenario," continued Saga.

In addition to these issues from a managerial point of view, issues were also emerging at the actual sites of production. As Katsuo Nara of the

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NEC Platforms Production Division explains,

"Without integrated processes that straddle sales, production and logistics, and with an environment in which business systems are also operated independently, we often find inefficiency in operations with regard to responding to customer demands. In addition, our efforts to reduce lead time from receipt of an order to delivery of a product are not going as planned. In order to stop creating more products than necessary ahead of time and to deliver products produced at factories in every part of Japan to our customers quickly using cross-docking, it was necessary to change the logistical flow and to significantly change our production process."

Solution

From here, NEC embarked on a "Global SCM Reform" plan for group-wide integration in order to standardize business processes and production management systems in the production management area, which previously varied between business divisions and plants. We decided to aim not only for a group-wide visualization of QCD (Quality Cost Delivery) and increased profits through business improvements, but also the implementation of a uniformly high level of manufacturing at factories across the world and, ultimately, the establishment of an optimum production system on a global scale. During the first stage, we embarked on an effort to classify each production activity for our products into one of four types, from I to IV, according to the product's characteristics. Specifically, mass-produced products such as mobile phones were classified as Type I; order assembly production type products (BTO: Built to Order) such as servers, storage devices and financial terminals as Type II; semi-customized products such as mainframe computers and broadcast instruments as Type III; and fully customized, designed to order products for domains including space technology, such as satellites, as Type IV. From there, we devised a standardization for each respective business process and production management system.

After classifying the production activities, we began work on the IT platform business, which corresponded to Type II. Firstly, we carefully considered the "perfect world scenario" for processes that would be appropriate for the standard type, with the aim of standardizing production business processes. Specifically, we had the "pull-model production system" in mind, in which products are manufactured to meet delivery dates requested by customers and not stockpiled. A series of manufacturing processes were defined as 14 distinct block processes, including standard manufacturing Bills of Material (BOM), master management, order receipt, demand plans, etc. We then adopted an approach in which we created scenarios for component procurement and stock management for each block. By combining



From the creation of "Big flow!" In general, the above three fields are made simultaneously

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these block unit processes accordingly, we aimed to absorb a great variety of differences between forms of production, trying to formulate a production business process that would be commonly used across the business to create production scenarios.

A standard system to support the implementation of business processes was created based on "IFS Applications," an ERP package with the strength to support production management. This system involves the following three points:

Firstly, the implementation of a system to seamlessly connect the sales management with the plants in order to support a pull-model production system. Specifically, it enables a delivery date promise to be

generated in real time, based on "production capacity information" that is created on the production management side in response to the order information entered on the sales management side.

The delivery date promise is adhered to without exception. Sales, production and logistics are all executed in a way to ensure fulfillment of the delivery date. In contrast with the traditional "Make-to-Stock" production model, in which surplus stock is plentiful, production lines and programs must be changed in order to meet delivery dates and deadlines are impossibly tight leading to waste, the new models ensures that such waste can be avoided.

Secondly, Manufacturing Execution System (MES) and Kanban systems are linked. At NEC, these two types of systems complement one another to support production management: the Kanban system controls production in units of one day and the MES does so more precisely in units of hours and minutes.



E-BOM : Engineering BOM M-BOM : Manufacturing BOM

Moreover, on the MES side which controls on-site production, manufacturing instructions are issued for BTO products based on material delivery confirmation. The instructions are aimed at delivering the end product, known as the "traveler". The traveler contains clearly specified information about the customer-facing product, such as quantity, day, time and which distribution service it will be shipped on, and the products are manufactured at the production site in accordance with this information. The minimum required stock for components to be used in manufacturing is automatically maintained using the Kanban system. At the same time, the production management side receives information from the MES, such as manufacturing instructions and work performance. This process enables efficient production with a short lead time which synchronizes with the distribution service.



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Finally, the construction of a Design-Manufacture interface. Traditionally at NEC, the Manufacturing BOM that correlates with engineering parts information and sales item information varies between each site, and this has created production flow issues. Therefore, a master BOM was created based on a company-wide standard data structure. The information required for manufacturing at each site was added to this master BOM and deployed as the manufacturing BOM for each site. A system to link this to the production management system was then built on a PLM solution, "Obbligato III". As a result, engineering changes can be rapidly and flexibly reflected in the production process.

Results

Thanks to efforts to reform production management at NEC Platforms, a production system that supports a customer-oriented pull-model production method was created. As a result, a delivery date promise was generated 100% on time and 100% adherence to the delivery date has been achieved. In addition, engineering changes can now be rapidly reflected in the production process and rapid production responsive to customer needs is now possible.

This has helped establish a foundation for group-wide standardization. In future, this system will be rolled out to each site, where IT system architecture costs can be significantly reduced.

While this standardized process and system will be expanded nationally, we also plan to deploy to sites overseas that use the same

form of production. If this is implemented, it will mean the establishment of an environment in which optimum ubiquitous manfacturing is possible on a global scale. "We will actively promote the standardized process and system to be applied in any form of business field," stated Masayuki Sawae of the NEC Platforms IT Strategy Headquarters.

In addition, the expertise gained from these efforts at NEC can be modeled to apply to diverse forms of production and business and we are driving efforts to provide such a system as a template to our customers. We would like to provide support on the software and hardware sides to help our customers reform their production management and construct a global SCM for their business," added Saga.

About

Using the power of ICT, we are focused on our role to create "Solutions for Society" and to support social values of "Safety", "Security", "Equality" and "Efficiency" with the aim of helping people live in abundance. We aim to be an "information society that is friendly to humans and the earth". As well as being a company that is loved by people around the world, we want to continue to operate in diverse regions by adapting to the cultures, and to provide products and services that will be loved by our customers. We will continue to contribute to the creation of these social values in every country and region around the world.