TWX-21 Business System Cloud for Global Corporations

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OVERVIEW: In today's global enterprise activity, interest in information system asset ownership is changing from "building in-house systems" to "deploying outside services." TWX-21 (B2B Business Media Services) is the brand name for SaaS styled services for business tasks available via a cloud platform, which has approximately 43,500 customer companies globally in over 20 countries and regions (outside Japan) and implements various customer business tasks by offering secure and high-quality services. In addition, TWX-21 is one of the major services in Hitachi Cloud Computing Solutions, the umbrella brand name for Hitachi's cloud solutions and services. Notably, many Japanese manufacturers are expanding their business in China and are facing various business issues in their global production activities. To solve these issues, Hitachi established the "China-SCM Project." This project evaluates and verifies Hitachi's contribution to the launch by enterprise software vendors of services on the TWX-21 cloud platform and to improvements in the usability of the service. TWX-21 helps these vendors to launch their service businesses by offering the SaaS Business Support Service, which was developed by streamlining and systematizing Hitachi's accumulated experience in operations management.

INTRODUCTION

DUE to the harsh economic conditions of recent years, Japanese companies are accelerating the movement of production and sales sites to outside Japan in order to respond to the sharp rise of the yen, cut production costs, and undertake local production and distribution in emerging countries as a market-oriented approach.

To align with changes in the business environment quickly and at low cost, companies' interest in ownership of IT (information technology) assets for enterprise activities is changing from "building in-house systems" to "deploying outside services." Demand for the deployment of cloud services for global business tasks and operations has been increasing.

Hitachi provides TWX-21 as its Business System Cloud, which enables business task operations to be made available via a cloud platform and supports EDI (electronic data interchange) between companies.

In 2003, TWX-21 introduced the Web-EDI Service to support global procurement. Since then, new services have been launched on TWX-21, such as the Global Supply Chain Management Service, Reverse Auction Service, and Environment Information Exchange Service. These offerings respond to increasing customer needs and the expansion of business tasks within customers' operations.

Today, TWX-21 is used by approximately 43,500 companies, of which about 2,400 are located outside Japan in over 20 different countries or regions (see Fig. 1).
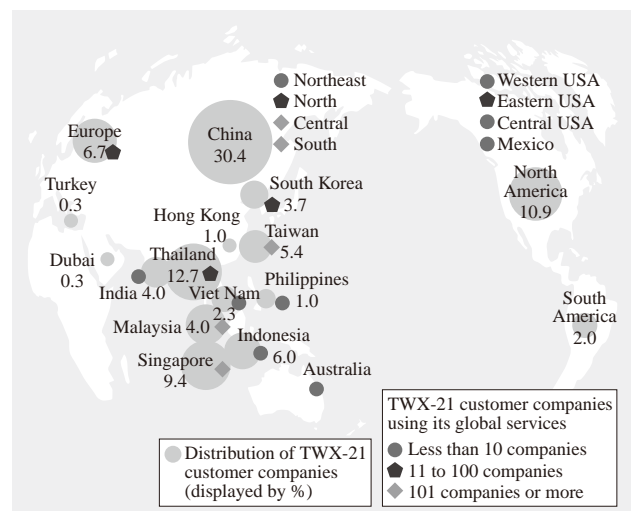

Fig. 1—Distribution Map of TWX-21 Customer Companies in Global Market.
TWX-21 has been launching global services since 2003. To date, TWX-21 has approximately 43,500 customer companies of which about 2,400 companies are located outside Japan in over 20 countries and regions.

This article covers three main topics. It starts by summarizing the business issues associated with production in China where many Japanese manufacturers are expanding their operations. Next it looks at the challenges that TWX-21 must overcome to manage production activities either jointly in Japan and China or from China alone. Thirdly, the article introduces the China-SCM (supply chain management) Project. The project evaluates and verifies Hitachi's contribution to the rapid launch by enterprise software vendors of services on the TWX-21 cloud platform and to improvements in the usability of the services.

BUSINESS ISSUES ASSOCIATED WITH GLOBAL PRODUCTION

Japanese manufacturers are expanding in China and Southeast Asia by establishing sites for mass production at lower cost.

In recent years, they have adopted a market-oriented approach and accelerated local production, distribution, and procurement.

They have also started handling design locally to introduce more market-oriented products. However, many business issues still remain that relate to global production activities (see Fig. 2).

(1) Issues related to SCM

In many cases, production management in China still depends on manual procedures using paper documents or spreadsheets.

This makes it difficult to determine the current status of work-in-process inventory and finished goods inventory and causes delays in responding to inquiries.

Although local procurement has been promoted, using paper purchase orders is a source of errors due to the issuing or receiving of mistaken information, including incorrect orders and shipping or rework resulting from incorrect change instructions.

Decision authority for local procurement is gradually being shifted to local production sites in China. However, some issues remain including a lack of knowledge transfer, unclear price decision-making processes, or dependence on the skills of individuals for negotiation.

(2) Issues related to engineering chain

For design, the tendency has been to divide responsibilities in such a way that overall design coordination as well as the design of core component or units is handled in Japan, while the local operation designs products to suit local requirements.

This requires the sharing of specifications, parts lists, schedules, and other information. However, in many cases, information transfer between the design site in Japan, production site in China, and design or production subcontractors is done by email or post and this takes time for confirmation.

This approach also makes real-time information sharing difficult. Information gaps and schedule delays can arise.

HITACHI'S CHALLENGES

These issues are still commonly faced by Japanese manufacturers including Hitachi.

In response, Hitachi's Industrial Manufacturing & Services Systems Division studied the issues related to business tasks and information systems, especially those between production sites in China and their local suppliers, and between production sites in Japan and China. Following the study, Hitachi established the China-SCM Project in partnership with enterprise software vendors. The project offers services for trial use via the TWX-21 cloud platform, and evaluates and verifies the offered services in terms of business task operations and information systems (see Fig. 3).

Use of information systems is indispensable for solving the issues facing global production. However, investment in IT may be reduced when starting up

Order management
- Manual procedures result in incorrect orders or shipping.
- Errors in the sending or receiving of information due to incorrect change instructions result in higher person-hours.

Design information management (using BOM)
- Recognition gaps between Japan and China regarding design information causes defective production.
- Information leaks to unauthorized people

Local supplier — Supply chain — Production site in China — Engineering chain — Head office in Japan

Production management
- Difficulties in finding the current status of inventory in the warehouse causes delays in responding to inquiries.
- Difficulties to obtain actual production status instantly

Project and documents sharing
- Sharing status information among participants is an urgent issue.
- Difficulties for design or procurement department to access correct design version

Information system
- Aging information systems, shortages of maintenance staff, and the building of new production sites create an urgent need for the development of new information systems. However, IT investment is sometimes reduced.
- Shortages of staff for system design and administration.

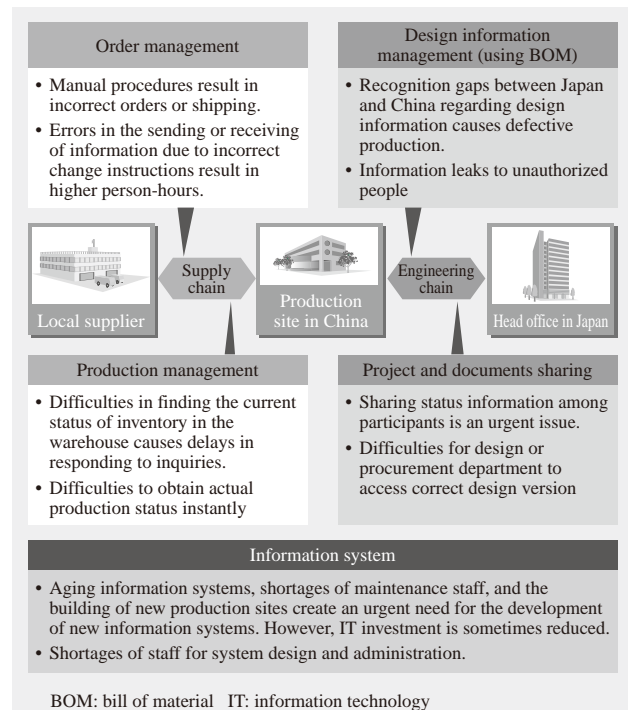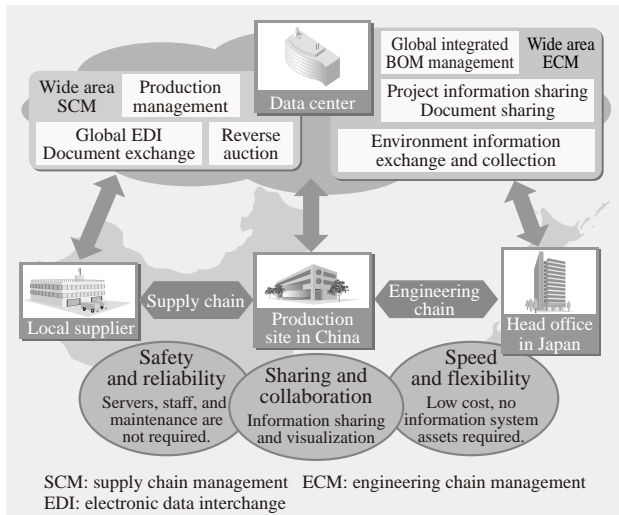BOM: bill of material   IT: information technology

Fig. 2—Business Issues for Global Production Activity. Issues include mistakes in the delivery and receipt of information between the production site in China and its local suppliers, and between the design site in Japan and production site in China.

Fig. 3—Overview of TWX-21 China-SCM Project.
Various services that support the supply chain or engineering
chain are provided on a trial basis by servers located in a robust
and high-security data center. Users can evaluate and verify
these trial services.

a local production site as getting operations up and running has top priority.

Furthermore, even after starting operations, recruiting and retaining IT staff can be difficult and this can lead to a lack of resources for tasks such as planning, design, development, operation, maintenance, and responding to user inquiries.

In this case, Japanese manufacturers with expanding businesses in China are placing high hopes on the use of cloud computing, because it can perform business task operations quickly and at low cost, with minimal local staff, and without requiring the ownership of IT assets.

In 2003, TWX-21 introduced the Web-EDI Service to support global procurement. Since then, it has been launching new services, such as the Web-EDI Service, Document Exchange Service, Global Supply Chain Management Service, Reverse Auction Service, and Environment Information Exchange Service.

Moreover, TWX-21 has streamlined and systematized Hitachi's accumulated experience in operations management on the TWX-21 cloud platform. Offering this experience and platform as the SaaS (software as a service) Business Support Service allows enterprise software vendors to develop services on the platform. The service was offered to customers for trial use through the China-SCM Project. This allows users and vendors to gain the following benefits.
(1) Users are able to evaluate and verify the services and adopt those that suit their business tasks and style.

(2) Enterprise software vendors are able to provide their existing SaaS via the cloud platform efficiently and quickly.
(3) Service usability is improved by developing a portal site with integrated gateways for all services (existing TWX-21 services and services offered by vendors) on the TWX-21 cloud platform, and by using single sign-on for user authentication.

The following section describes the global services of TWX-21 and the services offered for trial use through the China-SCM Project.

TWX-21 SERVICES

TWX-21 provides SaaS styled services for global business task operations on a cloud platform, and has been improving its global product range in various ways. For instance, all services and help desks are offered in multiple languages (English, Chinese, and Japanese) and are available 24 hours a day. TWX-21 uses a high-speed Internet network to ensure comfortable operation without being affected by communication limitations.

Web-EDI Service and Document Exchange Service

Global electronic commerce requires the exchange and sharing of real-time information among all the sites involved with SCM, which may be located in different countries or belong to different companies.

These services are available for use from any site, and user IDs (identifiers) are used to restrict access based on the user's role, examples of which include production, procurement, design, subcontractor, and logistics company.

These services support all participants and provide status visualization, accuracy improvement, quick business task operations, and lead time reduction by allowing the exchange and sharing of order, design, and delivery information.

Reverse Auction Service

One of the important tasks for a purchasing department is cost reduction. This service provides a reverse auction function to achieve efficient bargaining among suppliers.

User companies can adopt global procurement from suppliers in Japan, China, and Southeast Asia. The service also offers a transparent and real-time competitive environment on the web. It provides transparency in pricing, encourages fair prices, and shortens the time taken for bargaining.

Environment Information Exchange Service

Global chemical substance management regulations, including REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals), impose an obligation to transfer chemical substance information from parts suppliers to manufacturers and throughout the supply chain. This service offers functions for transferring chemical substance information, aggregated information about assembled products, and managing chemical substance information per unit of assembled product or part.

By these offerings, the service supports total business tasks for chemical substance information management, such as collecting, aggregating, and managing information, and supplying information to customers.

SaaS Business Support Service

TWX-21 draws on years of experience in SaaS businesses including planning, development, operation, monitoring, maintenance, version upgrades, promotion, and user support.

The service contributes to enterprise software vendors by allowing them to trial their services, and provides a seamless Business System Cloud that takes account of the results of user evaluation and verification.

Specifically, it offers a platform, data center operations, monitoring and other operational support, system infrastructure, service operation including help desks, frameworks for developments, and sales promotion support.

The process for the SaaS business was developed by streamlining and systematizing experience from business task processes and deliverables management.

By utilizing the service, vendors can quickly and efficiently take action and verify functions, operations, monitoring, and support of their services in technical areas. This means that services can be launched more quickly and with fewer person-hours. It is also important for a service business to offer the Business System Cloud with an ecosystem that recognizes user needs as a top priority. While using the service, vendors can gain knowledge of business operations management, such as user surveys, promotions, and enhancements (see Fig. 4).

OFFER OF TRIAL USE THROUGH CHINA SCM PROJECT

As described earlier, the China-SCM Project offers six business systems in cloud format for trial use. Users can evaluate and verify the service before deciding whether to adopt it. The following sections describe the introduction of three services based on the TWX-21 SaaS Business Support Service for the China-SCM Project together with the requirements for enterprise packages when applied to the Business System Cloud by the SaaS Business Support Service.

Production Management Service

Hitachi's production management package is offered on the Business System Cloud for trial use. It unifies various information for production site management,
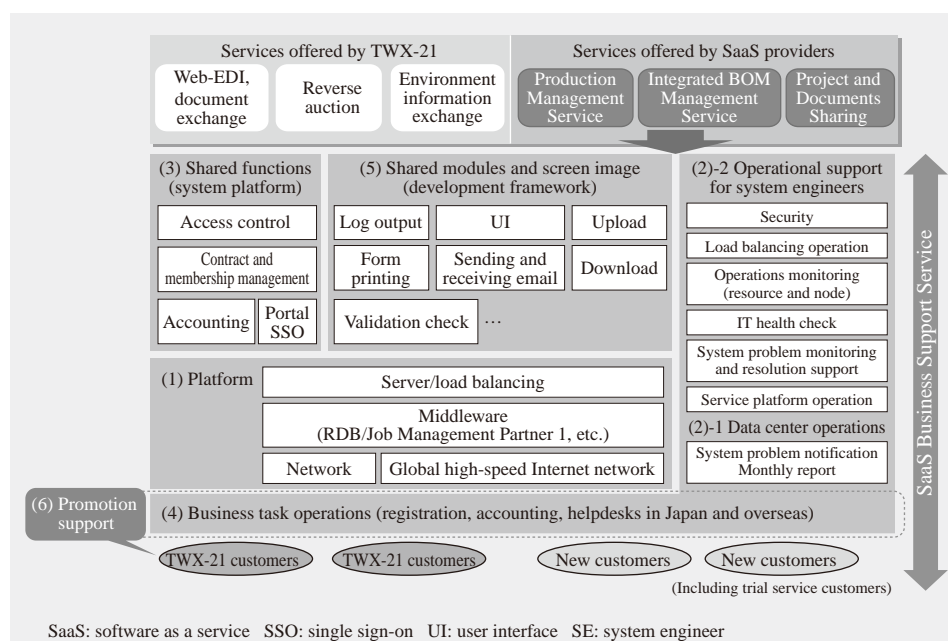

Fig. 4—Structure of SaaS Business Support Service. The SaaS Business Support Service streamlines and systematizes Hitachi's experience in operations management of TWX-21. Enterprise software vendors (SaaS providers) can launch their services quickly and at low cost.

including production, warehouse inventory, orders, and operation records. To acquire and share the latest information, it supports the management of inquiries by business partners and the judging of business issues. It also manages various kinds of inventory information such as physical stock, available stock excluding stock reserved by the production plan, and safety stock. This inventory information is available for viewing and analysis from various viewpoints including item, serial number, production site, and process.

Integrated BOM Management Service

The management package for Hitachi's integrated BOMs (bill of materials) is provided via the Business System Cloud for trial use. It manages several BOMs (including design BOMs and the production BOM) in a database and reduces the recognition gap among related sites. Use of the configuration comparison function makes it easier to compare design BOMs before and after design changes and to extract all items needed for the production BOM.

Furthermore, it enables the scope of authority for browsing or editing to be set for each user ID to prevent unnecessary information access and disclosure, and to administer what is needed by the participants.

Project and Documents Sharing Service

Hitachi East Japan Solutions, Ltd. offers its software package for sharing project information and documents via the Business System Cloud for trial use. It supports project information sharing among participants within and outside the company. Its Gantt chart schedule and progress management function prevent participants from seeing different versions of a schedule and progress report, which is a common problem when these are sent and received as email attachments. It also has a document management function for version management with a history that includes all previous files, and allows sharing of large amounts of data that would be difficult to send as an email attachment. These effective functions reduce the viewing of incorrect documents and cut the person-hours required for searching information.

Requirements when Offering Software on Cloud Platform

There are some prerequisites for providing enterprise software on a cloud platform. The first is to check the information system requirements and to upgrade the software. The second is to consider the information system in terms of Internet security, user authentication, operation monitoring, and global online quality assurance. The third is to consider sales promotion plans, contract programs, accounting, and billing methods. These requirements are systematized by the TWX-21 SaaS Business Support Service. Therefore, service vendors can proceed with their business plan by implementing it initially on a cloud platform so that they can collect and verify user needs while offering the service for trial use.

CONCLUSIONS

This article has described the business issues associated with global production, the TWX-21 Business System Cloud, and the challenges faced by Hitachi's China-SCM Project.

The Project and Documents Sharing Service was launched on the Business System Cloud in July 2011. The other services, meanwhile, have been trialed by over 20 companies. Hitachi plans to improve those services by utilizing their feedback.

Hitachi will continue to develop the SaaS Business Service in order to contribute to TWX-21 user companies and enterprise package vendors who are starting businesses on the cloud platform. Moreover, Hitachi will develop TWX-21 for SaaS partners so that it becomes a beneficial service platform for offering marketing support and other services.

REFERENCE

(1) T. Yoshida et al., "Base Technology and Know-how for B to B SaaS 'TWX-21' Contributing to Business Management," Hitachi Hyoron **92**, pp. 658–663 (Sep. 2010) in Japanese.

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