

[Executive Summary Document for 2011 SCC Supply Chain Excellence Awards]



* Category : Technology Advancement

* Title : Case Study of Fortune Global 500 consumer electronics and appliances company's single lot production scheduling project led by ZIONEX Inc.

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[Basic Company Information : ZIONEX Inc.]

ZIONEX Inc. was founded by 3 doctoral students from MIT (Massachusetts Institute of Technology) in January 2000.

ZIONEX in Korea and its subsidiary Comnext in Tokyo, Japan, currently have 61 and 8 employees respectively. The company's organization is composed of Management, Sales & Marketing, Consulting, R&D and TST (Technical Support Team) divisions.

ZIONEX' mission is two folds: (1) Add value to our client's supply chain though process innovation and optimization; and (2) Improve APS technology continuously for easy, general use.

ZIONEX is leading the SCM industry in Korea and Japan, and now into China with our accumulated SCM know-how, exceptional group of SCM professionals, and established SCM solutions. Our solutions help our customers to improve responsiveness and competitiveness by reducing order lead times and inventory levels while maintaining optimal service levels within a supply chain network. ZIONEX achieves desired business results by applying the breadths of knowledge accumulated over 10 years by both our intelligent software solutions and our experienced consulting experts.

[Product Information]

ZIONEX develops and deploys the technically super-intelligent advanced planning and scheduling solutions dubbed **T³Series™** (T³ is pronounced 'T Cube').

Our SCM solutions have been successfully implemented in many leading global high-tech companies such as SAMSUNG Electronics and LG Group, as well as Yokogawa Electric and Bridgestone in Japan.

T³Series is capable of covering today's toughest SCM/APS requirements from various industries. T³Series offers the SCM modules specifically tailored for high tech, distribution, and process / asset intensive industries.

T³Series embeds the best practices and delivers "one-stop" SCM solution comprising of the following core solutions.

- Demand Forecasting/Demand Planning
- Supply Chain Planning
- Factory Planning
- Container Loading Planning

The specific functions of each solution are as follows :

T³Demand (Developed by ZIONEX)

- Provide web based integrated consensus based forecast collaboration.
- Enable optimal statistical forecasting algorithm selection.
- Manage product life cycle and promotional events.
- Perform what-if forecast simulations and comparative analytic capabilities.
- Integrate bolt-on order management functionality (OMS) with ERP system.

T³SupplyNet (Developed by ZIONEX)

- Develop long- and mid-range supply plans encompassing manufacturing and distribution centers.
- Generate balanced plant capacity allocation and transportation plans based on optimized manufacturing and delivery costs.
- Compare and pick the best among multiple cost-based supply plan scenarios by varying the degree of supply chain constraints.
- Compute inventory replenishment plans imposed by different inventory policies.

T³Plan & T³Schedule (Developed by ZIONEX)

- Generate detailed production schedules.
 - Provide in-out work order sequencing at machine level.
 - Enable flexible modeling for describing complex manufacturing constraints.
 - Enable rapid what-if simulations to evaluate sudden changes in demand and/or production.
 - Enhance manufacturing efficiency by minimizing job changes.
- Etc.

We release the major versions of our software modules to our customers approximately every 1~1.5 years. Currently we're publishing minor upgrades on a periodic basis. (monthly/quarterly)

[Major Customers]

T³Series' solutions have been successfully installed at over 50 companies of the following sectors :

- * High-tech electronics (LCD, PDP, Mobile Displays, Semiconductors)
 - * Precision machinery
 - * CPG and food distribution
 - * Automotive parts
 - * Steel industries
- Etc.

(※ Name of Customer Company / Business Products of Customer Company)

< High-tech electronics >

SAMSUNG SDI	- PDP Panel, Lithium & Ion Batteries
SAMSUNG Electronics	- Home Appliances
SAMSUNG Techwin	- Aircraft Engine, Semiconductor Parts, Mobile Phone Camera
SAMSUNG Mobile Display	- AM OLED, TFT-LCD Panel
LG Electronics	- Mobile Communication Div., Home Entertainment Div., Home Appliances Div.
LG Display	- TV Monitor, Mobile LCD/OLED Panel
LG Innotek	- LCD Photomask
Telechips	- Semiconductor Chip for mp3, Mobile Phone Camera
Tomato LSI	- System on Chip (SoC) Design
Pantech	- Mobile Phone
Etc.	

< Steel industries >

Dongbu Steel
SeAH Besteel
Dongbu Metal
Etc.

- Steel Products for Manufacturing
- Special Steel
- Ferroalloy

< Automotive parts >

SL Corporation
NSK Korea
Etc.

- Head Lamp
- Precision Bearing

< Chemical >

Toray Advanced Materials Korea
Jaeil Industries
(Subsidiary Company of SAMSUNG)
Etc.

- Advanced Materials like Polyester Film
- Electronic Parts Materials

< CPG and food distribution >

SAMSUNG Everland
Casamia
Hanssem
Nongsim
Hansol (Paper, CSN)
SK C&C
Hanhwa 63 city
Etc.

- Resort, Foods & Beverages
- Furniture
- Furniture
- Foods & Beverages
- Paper, Logistics
- IT Services
- Aquarium, Foods & Beverages

< Precision machinery >

Hyundai Heavy Industry
OSG Korea
Etc.

- Marine Engine Div.
- Cutting Tool

[Introduction of Customer Company : Fortune Global 500 consumer electronics and appliances company]

This company has grown into one of the global leaders in consumer electronics and appliances industry. Through the aggressive investments in research and development in innovative technology and creative products, they are constantly driven to thrive as one of the best recognized companies in the consumer electronics sector while achieving our vision of "World's best at enriching lives through innovation." They are the leader in consumer electronics, mobile communications, and home appliances.

[Project Description : Single Lot Production Scheduling Project]

Back in 2008, the production planners of this company were experiencing the following difficulties at its plant in Korea.

1) Lengthy planning cycle time

: Due to tedious manual planning process required to meet single lot production strategy, this company's planners had experienced tremendous time losses due to heavy load of data processing. The lot creation or lot splits were all done manually by human planners, and thus every newly created lot needed to be entered into the ERP system by manual key-in. The production planning, lot creation, and key-in processes took as much as 14 hours per day.

2) Increased number of lots, due to higher leveled production requirements

: A need for improving the responsiveness of single lot production planning had been recognized. This company required that the single lot production target be increased from Level 3* to Level 4.**

* Level 3 indicates that each production line repeats the same production pattern every 2 hours.

** Level 4 indicates that each production line repeats the same item production pattern every 1 hour.

This means that the actual lot size in each production order needs to be halved from the Level 3, requiring more detailed production planning and increased manufacturing pattern complexity.

3) Non-standardized production planning processes

: Each production planner used to have his own unique planning style and algorithms which didn't conform to a single standard. This caused inefficiency and confusion across multiple production lines managed by different planners, and thus needed to be eliminated entirely.

4) System overload in Global ERP system

: This company shares a global ERP planning system called GERP across all one of their business division's global offices worldwide. The production planning had been carried out using GERP as well, which caused system overload due to the enormous amounts of production planning data shared by all global offices. They had to come up with a way to reduce the data transaction volume in GERP to address this issue.

5) Rolling out to other home appliance divisions

: Back in 2008, the single lot production strategy was implemented within one of their business division only. This company wanted to roll it out to all other home appliance manufacturing lines, and thus had to come up with a system with standardized production planning processes.

In order to resolve these difficulties mentioned above, this company chose to start the single lot production project with the hope of achieving the following results:

- 1) Implementation of methodical system with the leveled production options and constraints considering the each division's characteristics.

- 2) Establishment of standardized procedures for simulation and analysis of the leveled productions planning results
- 3) Securing the system infrastructure for rolling out the leveled production planning strategy to other divisions.
- 4) Reduce system overload occurring in GERP system, by providing a separate planning system infrastructure.

[Achievement through Single Lot Production Scheduling Project]

The project was carried out in 3 separate phases, each with ~4 month duration, and took 13 months in total. The total cost of the project was 1.2 billion Korean Won (or approximately 1 million US Dollars)

Through implementing the single lot production, the project staff is proud to have achieved outstanding, almost revolutionary accomplishments for this company.

As a starter, this company has dramatically reduced the overall lead time from order to delivery by more than 70%, from 41 days to 12 days. In addition, they improved the inventory turnover by 28%, the on-time delivery rate by 33%, and the demand fulfillment rate by 500% as well.

The overall financial contribution of this project to our company's bottom line is estimated to be approximately 150 billion won or 125 million US dollars.

More specifically, it had saved the cash flow by 88 billion Korean Won or 74 million US dollars, 14,215 m² (3.51 acre) of inventory space, and 230 million won or 190,000 dollars of losses associated with the product inspection.