The idea for developing Asprova SCM was originally conceived around 14 years ago. In the autumn of 1996, I attended the APICS (American Production and Inventory Control Society) expo held in New Orleans. The purpose of my visit was to see the offerings from our rivals in the production scheduler business. Being successful in America should mean being the best in the world. When I got there I was surprised to find many production schedulers singing the praises of "Global SCM". Before returning home I used my time at the expo to take in the ideas behind the SCM concept. The concept was great - imagine how pleased our customers would be with the realization of such a system! For a few months thereafter, I thought about how SCM software could practically be implemented. I concluded that at the current time, a successful system could not be made. In the first place, production schedulers were still not at a high level of completion. In 2001 we released an updated version of Asprova APS, keeping in mind the long-term goal of SCM. In 2006, I heard that MIT, the worlds top university for SCM study and teaching, was offering a two week intensive course in Supply Chain Management. In November of that year I attended the course and had much discussion with the worlds leading researchers on the topic, and gathered many ideas on the leading edge of SCM ideas. In 2008, the concept of cloud computing became popular and I consumed any reading material I could on the topic. As a result, it became clear that the time for a successful SCM system had arrived - with 64bit multicore CPUs, memory storage now in the tens of gigabytes, fast network connections making large distances mostly irrelevant, and greatly improved stability and security, any company could now use the technologies needed for SCM at a low cost. Development of Asprova SCM was started in October 2008. The aims for the package were: [1] High speed and scalable - fast performance on hardware ranging from low-cost PCs through to large cloud systems [2] Full featured and simple - containing enough functionality as standard so as to make further customization unnecessary, users should be able to implement the system on their own. [3] Low cost and short lead time - reduction of overall costs and time to implement the system. Asprova SCM was released in June 2010. By using cloud computing environments, this approach aims to dramatically reduce the cost of global SCM systems that previously would have required several hundreds of thousands of dollars to implement. Asprova Corporation president, Kuniyoshi Takahashi

Supply Chain Management

Asprova SCM

Supporting global supply chain optimization

● High speed, scalable

● Full featured, simple

● Low cost, short lead time
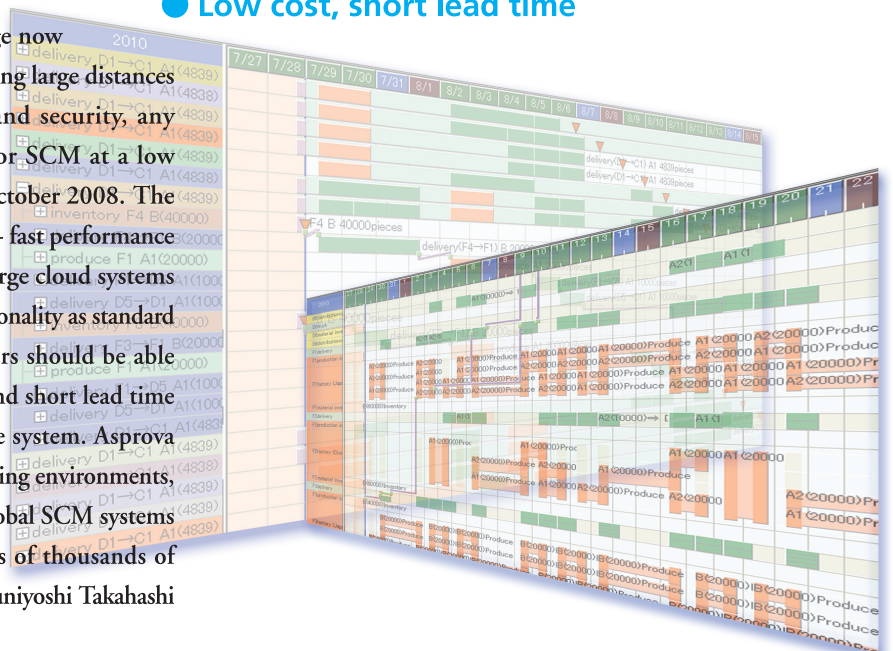
■Asprova SCM supports the visibility and optimization of the overall supply chain

Global expansion of the manufacturing industry requires a tool which can simultaneously manage [1] Global demand [2] Global distribution center networks (DC) [3] Global factory networks [4] Global supply. Asprova SCM creates a schedule for the overall supply chain, assisting in the visibility thereof, and the overall optimization of the supply chain. Scheduling features consist of SCP (Supply Chain Planning) and APS (detailed scheduling). Given demand input, SCP will create a schedule for multiple customers, distribution centers, factories and suppliers. Given the factory schedule from the SCP result, APS will create a detailed schedule for manufacturing at each factory.

■ Modelling the supply chain

An example of the type of supply chain handled by Asprova SCM is shown below. The supply chain consists of sites (suppliers, factories, distribution centers and final customers) linked by delivery resources (truck, ship, air freight etc). Factories and distribution centers can exist in multiple levels and have an inventory point (small red triangle) associated with them. Item C is consumed by factories F3 and F4 to produce item B, which is further consumed by factories F1 and F2 to produced the final item A1 or A2. The final product A1/A2 is then delivered to the customer via the distribution centers. Production constraints, and the constraints of delivery routes are registered in the master data for Asprova SCM.

Asprova SCM: example of supply chain and SCP(supply chain planning)・APS(detailed scheduling)
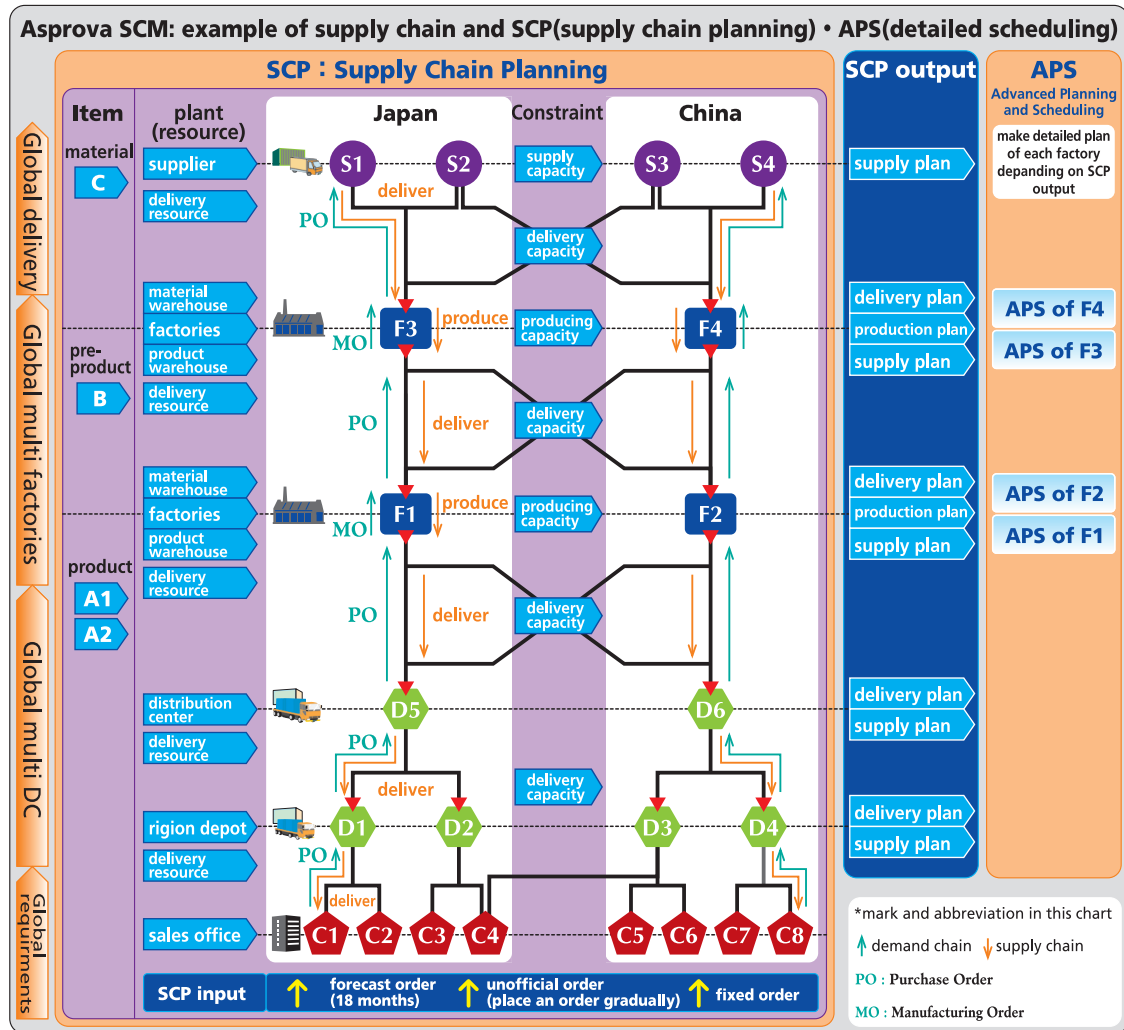
■ Input to Asprova SCP

In the example on the left, demand (orders) is input at the customers at the bottom of the chart. Orders can be forecast orders, tentative orders or confirmed orders. These can be input manually or imported from an external system such as an ERP system.

■ SCP calculation and constraints

With demand input at the final customer, SCP works backwards through the sites along the chain calculating material requirements, linking supply/demand between sites and simultaneously create a rough time schedule. The necessary purchase orders and manufacturing orders are generated automatically, and start/end times are determined for each production and delivery task. SCP considers all involved constraints: supply capacity, production capacity and delivery capacity.

The implement advantage of Asprova SCM

■ Realize the visibility of supply chain

Through delivery plan, supply plan, production plan, demand table, inventory graph, load graph, order Gantt chart, resource Gantt chart that output from SCP, we can find out and solve the problems such as delay delivery date and the bottleneck of supply chain overall, to realize the overall optimization.

■ Shorten the leadtime of supply chain overall

"Purchase order" and "production order" of each sites are in synchronization when SCP creates a schedule. The "total lead time" from material input to product supplied to customer can be reduced. Therefor, significant inventory reduction in supply chain will be achieved, and quick response of demand change also become possible. If puts inventory buffer at an appropriate site, the "delivery lead time" from receiving an order to product arrived to customers will be reduced, the opportunities of receiving orders also will be increased. Because SCP creates a schedule at a high speed, "planning lead time" is reduced so as the demand fluctuations impact can be communicated instantly overall supply chain.

■ Output from Asprova SCP

SCP outputs supply plans (purchase plans), production plans and delivery plans.

SCP output	Order type	Deciding factors
Supply plan	Purchase order	Supplier, customer, item, quantity, due date
Delivery plan		Delivery resource, departure time, arrival time
Production plan	Manufacturing order	Factory, item, quantiry, due date, start time, completion time

■ APS creates production schedules for each factory

From the production plan generated by Asprova SCP, a detailed production plan for each factory can be created by Asprova APS for each individual process involved, and work instructions can be issued directly from this schedule.

■ Easy to make a prototype

When you discuss to implement this system, we can make a prototype on base of your company' case to get a reification system image. Please feel free to contact us about making prototype.

■ Forecast orders

Forecast orders are input on a monthly per customer per item basis. Order data can be imported from an external system such as an ERP or demand forecasting system.

■ Inventory levels

Inventory levels for each item at each site can be specified, or imported from an external system.

■ Supply/demand table (Factory, DC)

Shows the supply, demand and inventory quantities at factory F1 for the finished items A1 and A2, and the input item B.

■ Inventory graph (Factory, DC)

Shows the inventory levels of finished items A1 and A2 at each distribution center D2. Late orders and quantity deficiencies can be seen at a glance. The pink area in the graph below shows insufficient quantity.

■ Supply/demand table (Purchased item)

Shows the supply, demand and inventory quantities at factories F3 and F4 for the raw material item C.

■ Inventory graph (Purchased item)

Shows the inventory levels of raw material item C at factories F3 and F4.

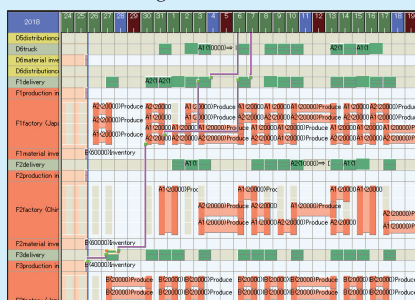## ■ Load graph / bottleneck evaluation

Shows the load of factories F1, F2, F3, F4. Factories F1 and F3 can be seen with higher loads.

■ KPI evaluation

Shows the KPI (Key Performance Index) for the overall supply chain as calculated by SCP. The KPI for multiple scenarios can be compared.
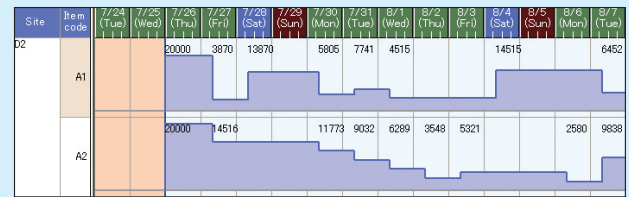
■ Resource gantt chart

This chart has resources (factories, distribution centers, delivery resources) on the vertical axis and time on the horizontal axis, and shows the timing and connection of these for the whole supply chain. The reason for late orders and other problems can be checked here. The chart is interactive so that work times, delivery routes etc can be modified.

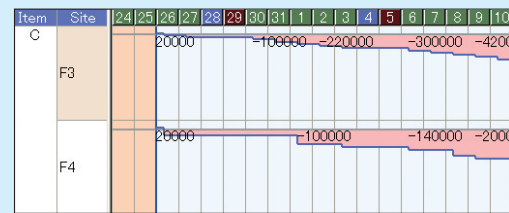## ■ Order gantt chart

This chart has orders (inventory, purchase, manufacturing etc) are on the vertical axis, and shows the relationship between orders in the supply chain. The status of orders and the peggings between them can be checked here.
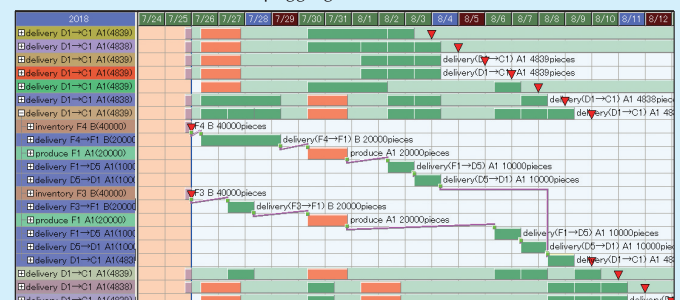
Asprova SCM product structure

user type	function
SCP	Makes a rough schedule for several factories and multi DC supply chain
APS	Makes a detailed schedule for one factory, including sales and purchase
MS	Makes a detailed schedule for one factory
MRP	Calculating the requirements for one factory
VIEW	Be able to view a created schedule and enter data
DH	(Data Host) Provides a facility for connecting the SCP, APS, MS, VIEW and other data (ERP system etc) sources.

Functions will be selected on base of the user types when log in.This document deals mainly with the SCP module. For further information on the APS module, please contact us.

Example cloud environment image
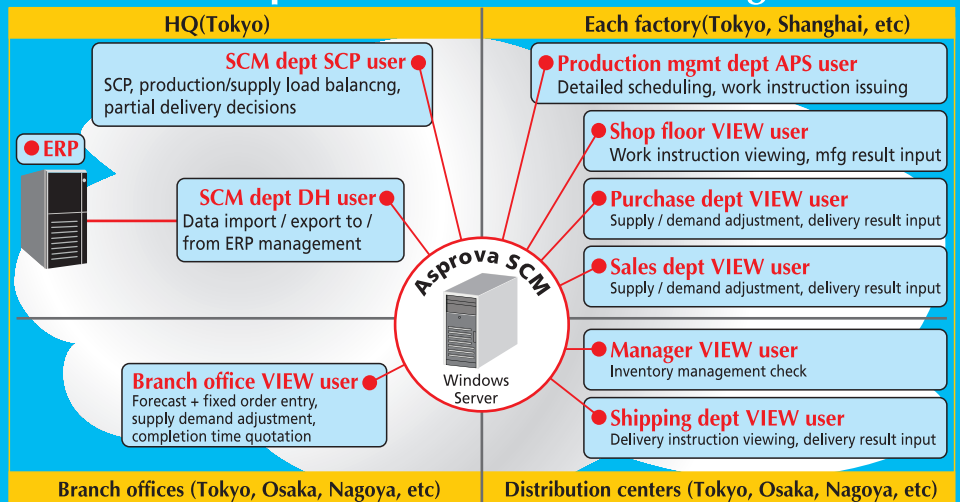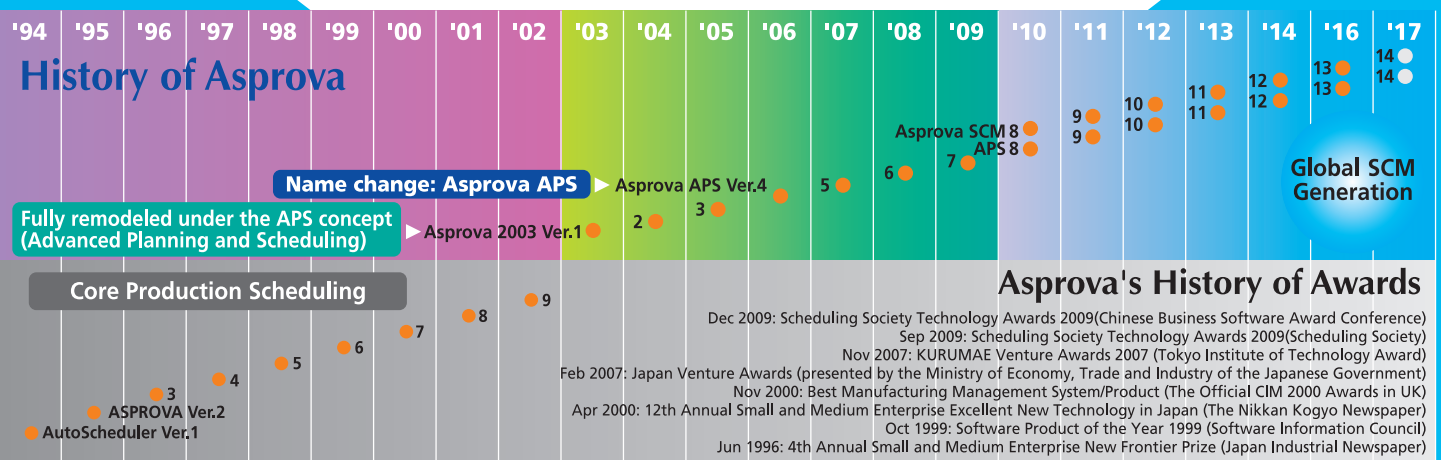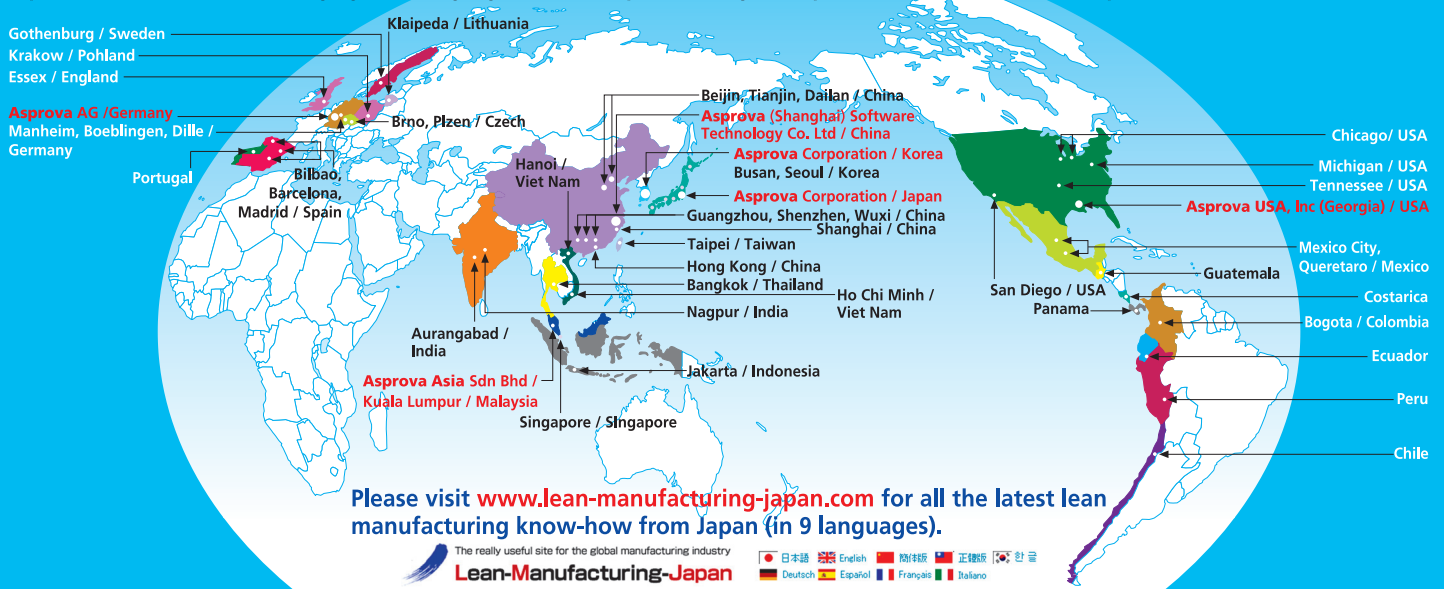
HQ(Tokyo)

SCM dept SCP user
SCP, production/supply load balancng, partial delivery decisions

● ERP

SCM dept DH user
Data import / export to / from ERP management

Branch office VIEW user
Forecast + fixed order entry, supply demand adjustment, completion time quotation

Asprova SCM

Windows Server

Branch offices (Tokyo, Osaka, Nagoya, etc)

Each factory(Tokyo, Shanghai, etc)

Production mgmt dept APS user
Detailed scheduling, work instruction issuing

Shop floor VIEW user
Work instruction viewing, mfg result input

Purchase dept VIEW user
Supply / demand adjustment, delivery result input

Sales dept VIEW user
Supply / demand adjustment, delivery result input

Manager VIEW user
Inventory management check

Shipping dept VIEW user
Delivery instruction viewing, delivery result input

Distribution centers (Tokyo, Osaka, Nagoya, etc)

Asprova SCM functions in the cloud environment or standalone. By using a cloud environment a global SCM / production scheduling solution can be achieved.

Our Global Support Network is ready for you!

Asprova is already in use at over 1,400 sites worldwide and is supported by our international network of licensed partners throughout Asia, Europe and America. Asprova is available in numerous languages including English, German, Spanish, Portuguese, Japanese, Korean, Thai, Chinese (simplified, traditional), Polish and Czech.

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Essex / England
Klaipeda / Lithuania
Asprova AG /Germany
Manheim, Boeblingen, Dille / Germany
Brno, Plzen / Czech
Portugal
Bilbao, Barcelona, Madrid / Spain
Beijing, Tianjin, Dailan / China
Asprova (Shanghai) Software Technology Co. Ltd / China
Asprova Corporation / Korea
Busan, Seoul / Korea
Hanoi / Viet Nam
Asprova Corporation / Japan
Guangzhou, Shenzhen, Wuxi / China
Shanghai / China
Taipei / Taiwan
Hong Kong / China
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Please visit www.lean-manufacturing-japan.com for all the latest lean manufacturing know-how from Japan (in 9 languages).

The really useful site for the global manufacturing industry
Lean-Manufacturing-Japan

日本語 English 简体版 正體版 한글
Deutsch Español Français Italiano

History of Asprova

'94 '95 '96 '97 '98 '99 '00 '01 '02 '03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '16 '17

Global SCM Generation

Asprova SCM 8
APS 8

Name change: Asprova APS
Asprova APS Ver.4

Fully remodeled under the APS concept (Advanced Planning and Scheduling)
Asprova 2003 Ver.1

Core Production Scheduling

ASPROVA Ver.2
AutoScheduler Ver.1

Asprova's History of Awards

Dec 2009: Scheduling Society Technology Awards 2009(Chinese Business Software Award Conference)
Sep 2009: Scheduling Society Technology Awards 2009(Scheduling Society)
Nov 2007: KURUMAE Venture Awards 2007 (Tokyo Institute of Technology Award)
Feb 2007: Japan Venture Awards (presented by the Ministry of Economy, Trade and Industry of the Japanese Government)
Nov 2000: Best Manufacturing Management System/Product (The Official CIM 2000 Awards in UK)
Apr 2000: 12th Annual Small and Medium Enterprise Excellent New Technology in Japan (The Nikkan Kogyo Newspaper)
Oct 1999: Software Product of the Year 1999 (Software Information Council)
Jun 1996: 4th Annual Small and Medium Enterprise New Frontier Prize (Japan Industrial Newspaper)