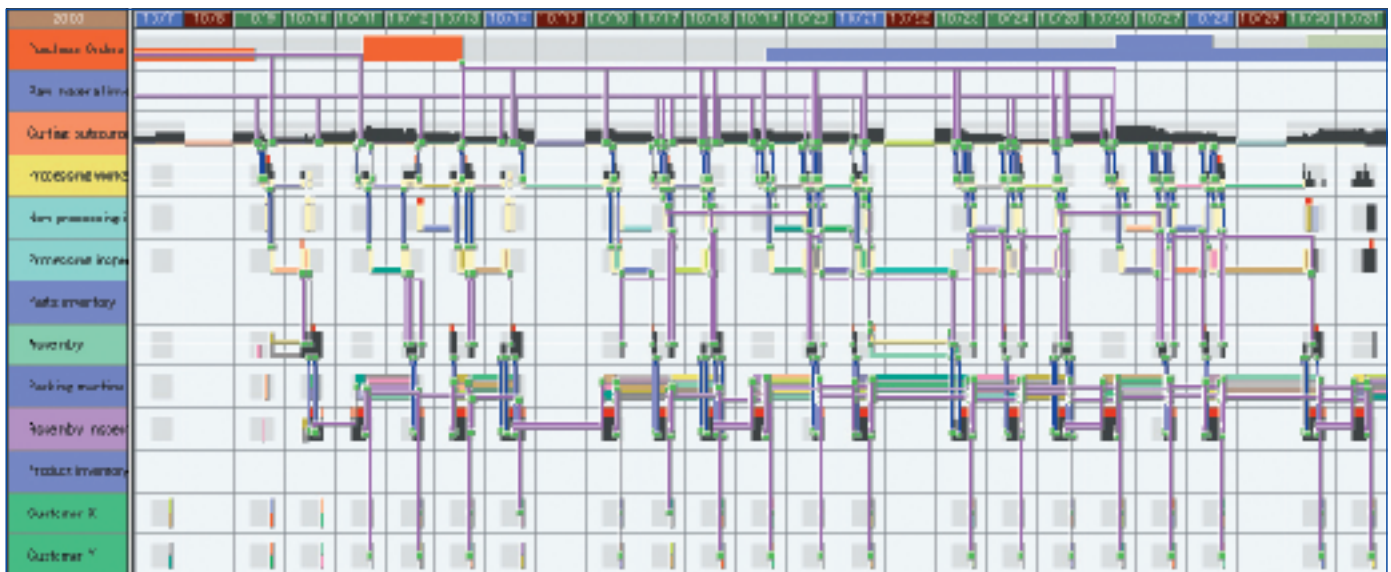# Asprova APS

APS (Advanced Planning and Scheduling) System With Network Support

Comprehensively optimize production and enterprise management with long-term, mid-term, short-term integrated planning

For total support of your production planning ... Asprova APS

The following solutions are available through three level long-term, mid-term, short-term planning

1 Long-term scheduling for ... Annual business plan   Asprova LS, Asprova MRP, Asprova KPI

Input sales forecast, calculate KPI through FCR (or MRP), and output a long term workforce requirements plan, equipment load plan, purchase plan, and sales/profit plan.

2 Mid-term scheduling for ... Production preparation   Asprova LS, Asprova MRP

Input customer forecast, and output through FCR (or MRP) a 3-month sales/profit plan, equipment load plan, workforce plan, production plan, purchase forecast, subcontracting forecast, and long lead time item purchase instructions.

3 Short-term scheduling for ... Work instructions   Asprova MS (production scheduler)

Input manufacturing orders, and output through FCS work instructions for the shop floor, subcontracting instructions, and short lead time item purchase instructions.

4 Integrated mid/short term scheduling for ... Order/forecast coordination   Asprova APS

Carry out production preparation based on a forecast, then input firm sales orders, and generate a schedule coordinating firm orders with the forecast to output work instructions for the shop floor.

5 Manufacturing BOM for ... Production data standardization   Asprova BOM, Asprova MRP

If your basic production data is not yet in order, then your first step is to prepare the manufacturing BOM. Reduce mistakes and improve quality by standardizing production data.

6 Network support for ... Production data sharing   Asprova NLS, Asprova DS

Enable use from any PC on your network to facilitate sharing of global production data.

For overseas expansion... Asprova APS

Our global support system is ready for your international expansion

Asprova is already in use in over 1000 factories worldwide and is supported by a network of more than 30 licensed distributors in Japan, the United States, Canada, South Korea, China, Hong Kong, Taiwan, Indonesia, Malaysia, Singapore, Thailand, Mexico, Spain, Portugal, Turkey, and the United Kingdom. Asprova is available in English, Japanese, Spanish, Portuguese, Korean, and Chinese (Simplified, Traditional).

You can start with the free trial version. For details, see www.asprova.com

By simply registering and becoming a member, you can download the free trial version of Asprova, introductory manual, and profit increase diagnosis sheet from the Asprova web site at no cost

Asprova's History of Awards

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 - New Product Prize
[The Asahi Bank Foundation for Small and Medium Enterprise Promotion /
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]

Terminology
APS : Advanced Planning and Scheuling
BOM : Bill of Material
DS   : Data Server
FCR : Finite Capacity Rough-scheduling
FCS : Finite Capacity Scheduling
GUI : Graphical User Interface
KPI   : Key Performance Indicators
LS   : Long-term Scheduler
MES : Manufacturing Execution Systems
MRP : Material Requirement Planning
MS   : Manufacturing Scheduler
NLS : Network License Server
OP   : Option

Asprova LS : Long Term Scheduler / Asprova MRP

Execute high-precision long term scheduling.   Calculate material requirements at ultra-high speed.

Annual sales plan
Customer forecast

Sales plan → Sales Option → [schedule screen] → Purchase Option → Purchase plan

→ KPI Option → KPI

Manufacturing plan
Subcontracting plan

Asprova LS

Input manufacturing orders based on annual sales forecast or 3-month customer forecast, and perform long-term scheduling using the technique of finite capacity rough scheduling (FCR).

Finite capacity rough scheduling (FCR)

Bucketless finite-capacity MRP that takes into account the load on machines and workers. This enables more precise purchase plans and machine/worker load plans compared to fixed lead-time based calculations.

Long term load check

Check the load on machines and workers, and display the required worker count or the need for overtime or holiday work.

Asprova MRP

More precise results can be obtained by using Asprova LS, but if you prefer to start operation using a more simplified manufacturing BOM and are interested more in calculating material requirement quantities rather than scheduling, Asprova MRP is the solution of choice.

Manufacturing plan, subcontracting plan

Display a forecast of work that is expected to be issued to the shop floor or to subcontractors.

Sales option

Input sales orders, generate manufacturing orders, and peg them.

Sales plan ... parts requirement forecast supporting auto and other parts manufacturing

Input or import sales forecast or customer forecast data and display in the form of a sales plan table

Daily leveling ... achieve leveled production

Split monthly forecast data into daily quantities to smooth production. Assign weights to different time periods, for example to produce more in the first half of the month and less in the second half.

Auto-replenishment of mfg. orders, fixed period lot sizing

Peg sales orders to inventory. Automatically generate manufacturing orders when inventory is insufficient. Determine manufacturing order lot sizes based on user-specified rules, including fixed order quantity and fixed period lot sizing.

Purchasing option

Calculate required quantities and times of purchase items and output purchase orders.

Auto-replenishment of purchase orders, fixed period lot sizing

Peg manufacturing orders to raw material inventory. Automatically generate purchase orders if inventory is insufficient. Determine purchase order lot sizes based on user-specified rules, including fixed order quantity and fixed period lot sizing.

Purchase order scheduling

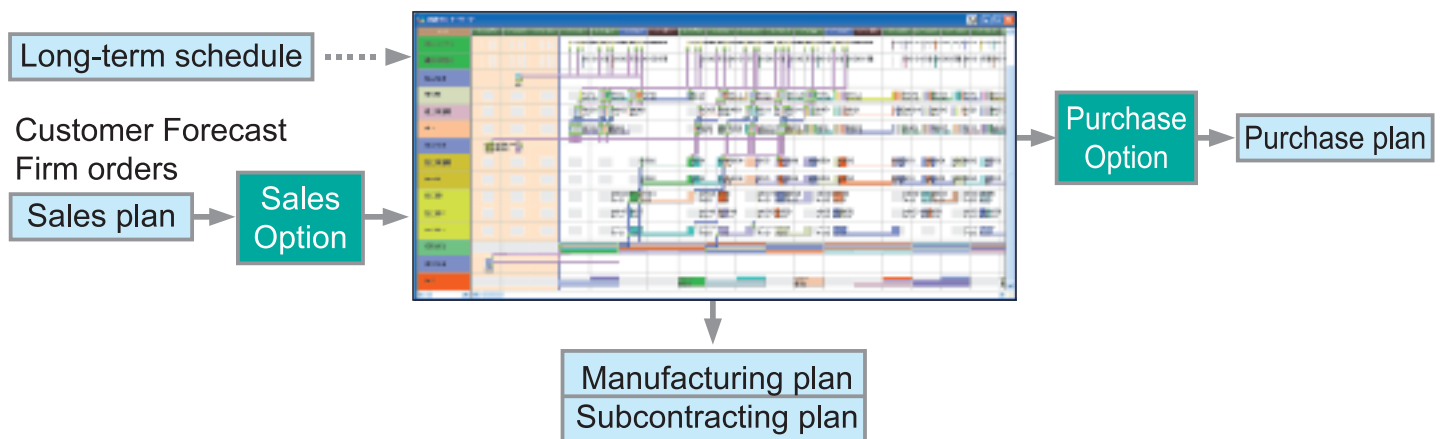Schedule purchase orders based on a purchase lead time.

Purchase plan

Display purchase plans summarizing the auto-generated purchase orders. Long term portion of the purchase plan can be sent to suppliers as a requirements forecast. Short term portion forms the basis of firm orders.

As a tool for creating work instructions through short term scheduling

Asprova MS : Short Term Scheduler
Create detailed schedules using FCS.

Long-term schedule

Customer Forecast
Firm orders

Sales plan → Sales Option →

Purchase Option → Purchase plan

Manufacturing plan
Subcontracting plan

Rich-featured, ultra-fast logic

Create short term schedules at ultra-high speed. Asprova's production scheduler provides numerous advanced features include external setup, time constraints between processes (ESE, EES, ESSEE, SSEEE), pegging method between operations (N-to-N, 1-to-1, inventory+1-to-1), inventory expiration date, pegging conditions.

Also, by synchronizing with mid/long term scheduling, short term schedules can be generated in consideration of long term schedules.

Parametric BOM

Define multiple products with a single manufacturing BOM through use of conditional expressions and calculation formulas. Even for problems that could traditionally only be solved through development of plug-ins or other customization, you can now solve just by entering expressions on the spot. This enables large reductions in the amount of manufacturing BOM data.

Skill map

Enter skills of individual workers as a matrix and perform scheduling considering those skills. This greatly eases input and maintenance and manufacturing BOM data dependent on work skills, and can enable large reductions in the amount of data.

For production data standardization

Asprova BOM : Mfg. BOM Input
Input and edit manufacturing BOM data.

As a manufacturing execution system

Asprova MES : Instructions, Results
Display Gantt charts on the shop floor or other locations, and enter results data.

Excel-like data input

Manage manufacturing BOM data easily in a single table. Reduces the load of inputting manufacturing data, reduces errors, and improves efficiency of daily operations.

Unified master data for long, mid, and short term planning

Quick shoot

Make a trial schedule of the manufacturing BOM you input and display the result in a Gantt chart to get immediate feedback on the accuracy of the input data.

BOM drilldown, reverse BOM drilldown

Parent order drilldown, child order drilldown

Resource Gantt chart

Display schedules (work instructions) for each resource.
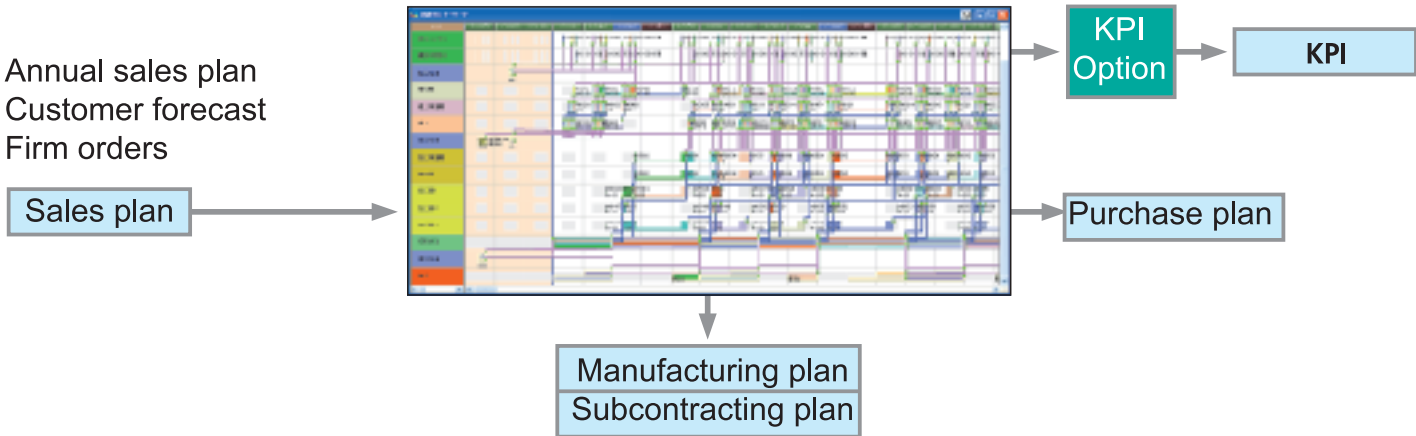
Order Gantt chart

Display schedules (work instructions) for each order.

Results data entry

Enter results data from the resource Gantt chart or order Gantt chart.

Asprova APS = Asprova LS + Asprova MS + Sales Op. + Purchase Op.

Perform long, mid, and short term scheduling across sales, manufacturing and purchasing in a single module.

Annual sales plan
Customer forecast
Firm orders

Sales plan

KPI Option

KPI

Purchase plan

Manufacturing plan
Subcontracting plan

Scheduling from sales through purchasing

Schedule sales through purchasing all at once. Generate schedules fully pegging sales orders to manufacturing orders, and manufacturing orders to purchasing orders to enable true lead-time reduction and to reduce manufactured item and purchased item inventory.

Long/mid/short term mixed scheduling

Perform rough scheduling for the mid to long term and detailed scheduling for the short term, and display both on a single Gantt chart.

Reduction of MRP-related problems

Traditionally production scheduling systems were often used in combination with the MRP module of an enterprise system. However, such a combination produces the following problems:

1. An interface must be developed between the scheduler and MRP system.
2. The MRP system and scheduler require different master data.
3. MRP purchase plans are not synchronized with the work instructions calculated by the scheduler.
4. Returning schedule data to the MRP system to achieve such synchronization is problematic for most MRP systems.

Using Asprova APS alone fully solves these problems.

As a performance evaluation tool

Asprova KPI : Key Performance Indicators

Calculate KPI based on schedules from Asprova LS. By using Asprova as a tool for preparing long term business plans, greater implementation returns can be achieved than is possible with traditional production schedulers.

Period KPI

KPI for a specified period, allowing comparisons of performance over different periods.

Earnings, material cost, outsourcing cost, total cost, profit, profit ratio, ROA, sales order LET achievement, finished item inventory, parts inventory, purchased item inventory, total inventory, finished item inventory qty, parts inventory qty, purchased item inventory qty, total inventory qty

Order KPI

KPI by order. Calculates estimated cost and profit. Use it to check how profitable different items or orders are.

Earnings, profit, profit ratio, cumulative material cost, cumulative outsourcing cost, cumulative labor cost, cumulative total cost

Item KPI

KPI by item.

Consumption qty, consumption value, production qty, production value, daily demand qty, inventory turnover days, earnings, material cost, total inventory, total inventory qty

Resource KPI

KPI by resource.

Setup time, production time, teardown time, working time, load (including setup), load (excluding setup), outsourcing cost, labor cost

Sample output of period KPI

Property	Value
⊟Evaluate KPI(06/09/25	Evaluate KPI(06/
Earnings	$1,536,000
Material cost	$774,000
Outsourcing cost	$116,000
Labor cost	$181,167
Total cost	$1,081,987
Profit	$454,033
Profit ratio	29.6%
ROA	541.0%
Sales order LET achie	100.0%
Purchase order LT a	
Finished item inventor	$34,000
Parts inventory	$2,420
Purchased item invent	$47,500
Total inventory	$83,920
Finished item inventor	300
Parts inventory qty	2600
Purchased item invent	75500
Total inventory qty	78400

Fields (properties) can be added freely and calculated automatically through user-defined expressions. KPI calculations are all defined as expressions so that they can be user-customized.

Asprova NLS : Network License Server / Asprova DS : Data Server

Manage logins from PCs across network   **Integrates data among modules.**

Asprova LS
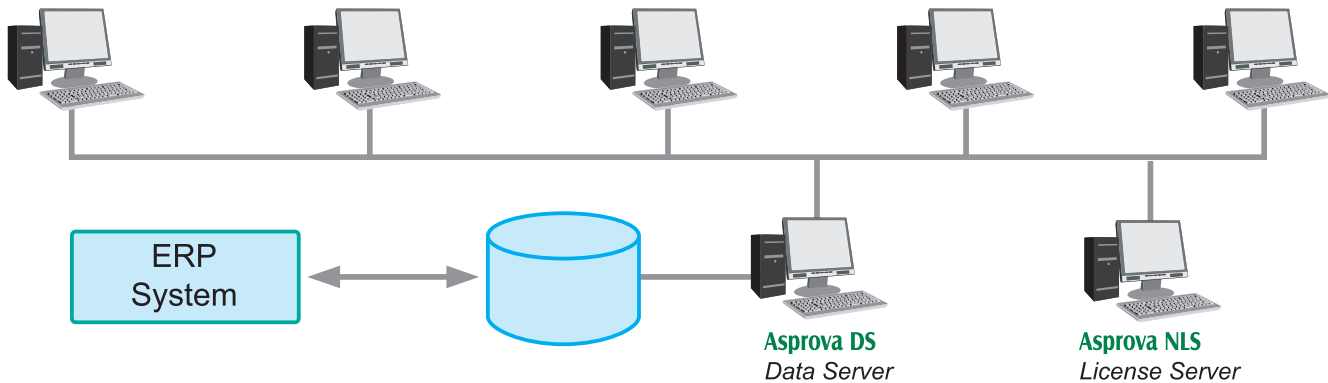*Mid/long term Scheduling*

Asprova KPI
KPI monitoring

Asprova MS
Short term scheduling

Asprova BOM
Mfg. BOM input

Asprova MES
Instructions display
Results entry

ERP System

Asprova DS
Data Server

Asprova NLS
License Server

Asprova NLS

Start up Asprova from any PC on the network. Project data can be shared via network connection, enabling users to view or modify data even from remote locations.

* At least 1 APS, LS, MS, or MRP license is required for each unit of planning (project).

Asprova DS

Each user can work on their own computer while Asprova DS synchronize their modifications. In this way, the person in charge of long term scheduling can use Asprova LS, the person in charge of short term scheduling can use Asprova MS, and the people in charge of managing manufacturing data can use Asprova BOM, while integrating the shared information as a single project.

* Linking to ERP system is possible even without Asprova DS.

Tools for Easy Customizing

Customizablility

Expressions

(mathematical expression; string expression;
logical expression; date expression; time expression)

These expressions, similar to formulas in Microsoft Excel, are used extensively throughout Asprova to enable customizing of a multitude of settings, such as the following:

Scheduling period; assignment period; assignment resource evaluation expression; production factor; user-specified earliest start time; filtering of assigned orders; filtering of assigned operations; pegging maintenance condition; kanban count; command loop condition; order start buffer; order end buffer; resource valid condition; furnace condition, Apurchase lead time; packing / shipping lead time; pegging condition; effective inventory period; order / operation code generation method; required quantity calculation; setup time; production time; teardown time; selection condition of process selector; selection condition of task selector; valid condition of Integrated Master Editor row; skill judgment condition; KPI calculation; data conversion during import / export; filtering of data during import / export; filtering of table / chart display; background color of table cells; text color ...

Field mapping

Graphically set field mappings for interaction with tables of external databases, e.g., RDB, CSV.

Plug-ins

Asprova supports plug-ins developed with Visual Basic, C++, etc. Likewise 'automation clients' can be setup to run repetitive tasks without manual intervention.

User defined property

New fields can be added to any table. User-defined properties are also accessible in expressions, making this a powerful method of creating sophisticated customizations.

Virtual property

User defined properties can be specified as expressions, enabling you to create dynamically calculated values.

Asprova APS Product Structure

Module	Functionality					Options						
	GUI / Results	BOM Input	MRP	FCR	FCS	Sales Order	Purchase Order	KPI	Resource lock	Time constraint MAX	Event	Optimization Logic
APS	●	●	●	●	●	●	●	▲	▲	▲	▲	▲
MS	●	●	●	●	●	▲	▲	▲	▲	▲	▲	▲
LS	●	●	●	●		▲	▲	▲				
MRP	●	●	●			▲	▲	▲				
BOM	●	●										
MES	●											
KPI	●							●				
DS												
NLS												

You can choose modules freely as needed.
MES and KPI are not stand-alone modules.
● = standard functionality
▲ = can be added

Examples of extraordinary achievements following installation of Asprova

An electronic component manufacturer, Tokyo:

Before deploying Asprova, we had the lowest score in the benchmarking criteria of an important customer, but now we are the runaway top.

A paper mill, Tokushima:

We were able to entirely eliminate the more than 40 hours of overtime that the planning team was spending on the next month's production schedule.

A dyeing manufacturer, Nara:

We experienced steep increase in sales after deploying Asprova.

An automotive pipe manufacturer, Ibaraki:

We were able to reduce our inventory by more than 30% in monetary terms.

In the midst of price pressure, we were able to lower our break-even point by nearly 35%.

Details on these Asprova based profit increase projects are described by Zenjiro Imaoka in the above book, "Manufacturing Time into Money" published by The Nikkan Kogyo Shimbun, Ltd.
- based on actual interviews with companies that deployed Asprova.

Your factory can expect similar results too ...

As Asprova has a wealth of experience with more than 1000 users throughout the world, some of these examples may be applicable to your case. Asprova is highly regarded across diverse industries, as shown below:

Electric Electronics	LEDs; connectors; solderless terminals; microprocessors; printed circuit boards; silicon wafers; air conditioner cases (plastic molding); speakers; ceramics; watches; semiconductors; lead frames; CD-ROMs; CD-R / DVD / CD-ROM drives: electric wire; LCDs; stereos; photo masks; WF cables; sockets; mobile phones; connectors for mobile-phones; IC packages; aluminum electrolytic capacitors; photoresist; TFT modules; piston rings; needles; piano wire; printer pins; automotive meters; photoelectric board; digital cameras; car navigation systems; refrigerators;light fixtures; sensors; signal controllers; solar-powered battery modules; vacuum fluorescent displays; batteries; multipolar connectors;power cables; mainframe computers ...
Automotive	Engine parts; doors; chassis; interior (plastic molding); metal molds; shock absorbers; vehicle inspections; pipes; tubes; engines; cranes; rubber; aircraft parts; test bodies; brake parts; high-pressure hose; seat fabrics; wire rope; transmissions; camshafts; crankshafts; cases; wire harnesses; motorcycles; bicycles ...
Machinery	Looms; kitchen appliances; machine tools;agricultural machinery; industrial machinery; optical instruments; light fixtures; air conditioners; heating appliances; plastic parts for office equipment; control computers; material handling equipment; power transmission equipment; power-driven hand tools; internal combustion engines; in-line instrumentation systems; wafer visual inspection equipment; centrifuges; sewing machines; heat treatment equipment; tanks; water tanks; turbines; condensers; model engines; vacuum pumps; wafer precision equipment; food products machinery; electric facilities; gas and water-related tools; water supply-related instruments; electric welders; stage lighting fixtures; sewing machine parts ...
Metal	Drills; screws; cannons; wire; plumbing fixtures; guard rails; pipes; magnet wire; steel; sheet metal parts; fence; metal bridge parts; blades; connecting rods; nuts; industrial precious metal products; drawing alloys; aluminum for beverage cans; blades for cutting machines; gears; metal springs; timer parts; precision gears; aluminum foil; sheet copper; ship plates; drawn copper products; specialty steel products; cutting tool tips; lubricating oil packaging; beverage cans; magnets ...
Non-metal	Corks; packaging; textiles; paper; shipping blocks; camera films; rubber products; ABS resin; UV ink; gravure ink; printing of packing materials; coated abrasives; resin hose; coating materials; dental materials; film sheets; ceramic base for electronic parts; tiles; firebricks; new cetramics; catalysts; paper clay ...
Consumer goods	Fermented soybeans; detergent; flour; plastic bags; plastic food containers; plastic models; office goods; fishing reels; microwave dinners; magnets; wood processing; socks; cans; cosmetics; rubber stamps; ballpoint pens; shampoo; shopping bags; cardboard; home exterior products; drinking water; entranceways; underfloor storage units; fixture components; shoes; toy parts; necklaces; stockings ...
Medical	Medical products; test drugs; medical equipment; laboratory testing reagents; granulated powder; pills ...
Chemical	Adhesives; plastic; asphalt; silicon; motor oil; polyethylene; polypropylene; molding materials; rubber; fluorine chemical products; polyvinyl chloride; polyvinyl chloride paste ...

Message from the President
On the Release of Asprova APS

Asprova Corporation was founded in 1994 as the first company in Japan to specialize in production scheduling software. Since then, we have continued to focus solely on the development and sales of the production scheduling software Asprova. We established overseas subsidiaries in Beijing, China and Seoul, Korea (in 2005 and 2006 respectively) to strengthen our global support system for worldwide manufacturing businesses.

I am pleased to say that Asprova has now been implemented in over 1,000 factories worldwide. Among these are cases where companies buy one license at first, and then go on to deploy Asprova in one factory after another after confirming the benefits of the first implementation. In one case, a single company has deployed over 40 licenses of Asprova. This overwhelming number of users is proof of the value of the benefits of implementing Asprova.

Recently, we renamed Asprova2003 to release the Asprova APS Series. Asprova APS goes beyond the traditional concept of production schedulers by supporting the overall production planning on three levels (i.e., long term, mid term and short term scheduling) to cover sales, production and purchasing. Asprova as a traditional production scheduler provided short term scheduling for production processes as its core feature. With Asprova APS, however, we further expanded this production scheduler feature. Through long term scheduling, Asprova APS develops annual business plans and performs 3-month production preparation, which will be followed by synchronized short term planning to provide an environment similar to actual business operations. Moreover, by enabling scheduling of sales and purchasing in addition to production, Asprova APS produces greater effectiveness in terms of reducing both total lead-time and inventory.

The new architecture APS system Asprova APS is a crystallization of our original technologies that are based on the manufacturing know-how of the more than 1,000 Asprova users around the world. Within the company, we say we are working to be "the three world's bests", namely: "the world's best scheduling logic"; "the world's best graphical user interface"; and "the world's best external interface." These are the goals of the Asprova development team.

However, Asprova APS is not just the results of the pursuit of something technically impressive. Once, I was told with great emotion by one of our users that "deploying Asprova was what saved our company from bankruptcy." Hearing that, I too was deeply moved. What I felt at that time was that "in an industry environment where it is as hard to make a profit as it is now, there can surely be no more rewarding work than if I could contribute to increasing our customer's profits."
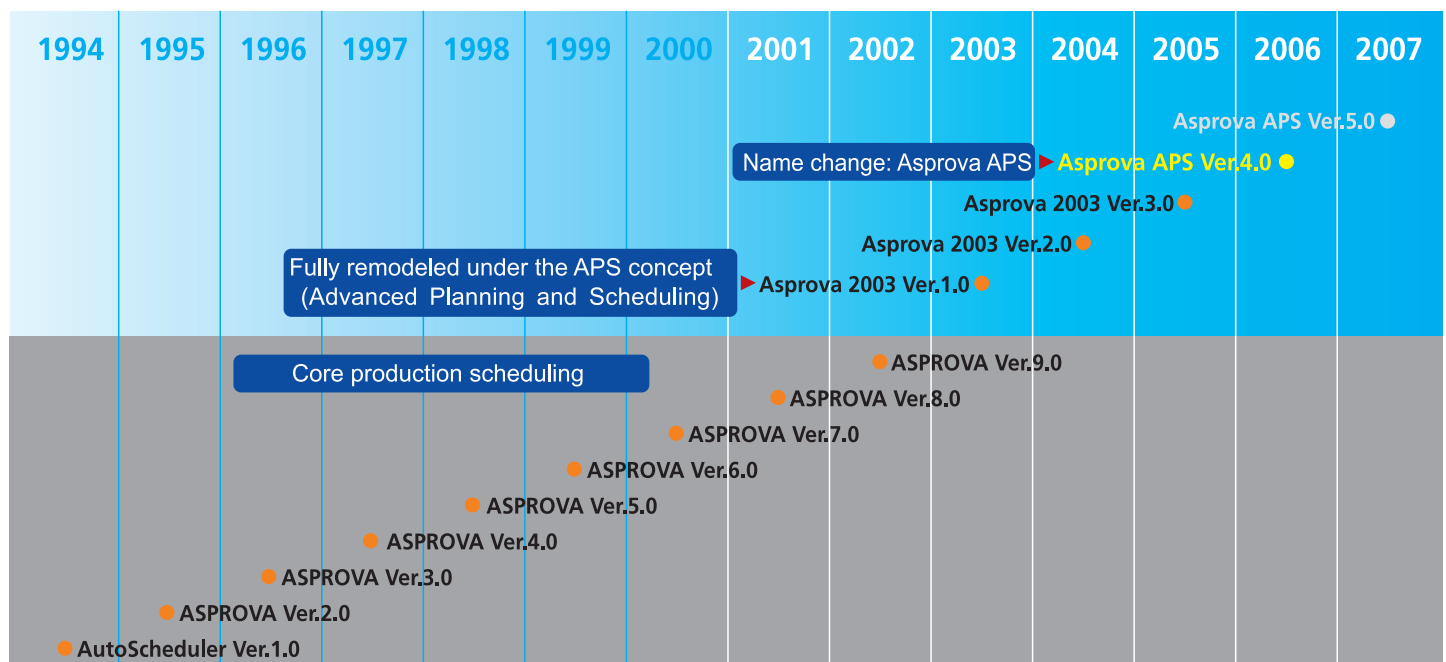
It was that conviction that led me to set our primary goal in designing Asprova APS to "contributing to increasing the profits of our customers." It is not easy to make a significant increase in one's customer's profit with just a piece of software. But in the setting of this goal, we aim for what is really important regardless of the difficulty - it is precisely this challenge which makes for a worthwhile goal to strive towards.

If by using Asprova APS you can achieve visual management in your factory, sustain on-time delivery rate, dramatically shorten lead times, reduce inventory and increase your profits, then we will truly feel that our efforts were worthwhile. I hope that this feeling will be communicated to you through Asprova APS.

Kuniyoshi Takahashi
President and CEO
Asprova Corporation

History of Asprova

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007

Asprova APS Ver.5.0 ●

Name change: Asprova APS ► Asprova APS Ver.4.0 ●

Asprova 2003 Ver.3.0 ●

Asprova 2003 Ver.2.0 ●

Fully remodeled under the APS concept (Advanced Planning and Scheduling)

► Asprova 2003 Ver.1.0 ●

Core production scheduling

● ASPROVA Ver.9.0

● ASPROVA Ver.8.0

● ASPROVA Ver.7.0

● ASPROVA Ver.6.0

● ASPROVA Ver.5.0

● ASPROVA Ver.4.0

● ASPROVA Ver.3.0

● ASPROVA Ver.2.0

● AutoScheduler Ver.1.0

Asprova Corporation, http://www.asprova.com/
Head Office (Tokyo, Japan)
    Gotanda Mikado Building 8F, 2-5-8 Hiratsuka, Shinagawa-ku, Tokyo 142-0051 Japan
    Phone: 81-3-5498-7071 / Fax: 81-3-5498-7072   E-mail: info@asprova.com
China: Asprova(Beijing) Technology Co., LTD. http://www.asprova.cn E-mail: info@asprova.cn
Korea: Asprova Co., Ltd. http://www.asprova.co.kr   E-mail: asprova@asprova.co.kr