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
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]
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%.

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 (plas molding); speakers; ceramics; watches; semiconductors; lead frames; CD-ROMs; CD-R / DVD / CD-ROM drives; electric w; LCDs; stereos; photo masks; WF cables; sockets; mobile phones; connectors for mobile-phones; IC packages; alumin electrolytic capacitors; photoresist; TFT modules; piston rings; needles; piano wire; printer pins; automotive meters; photoelec board; digital cameras; car navigation systems; refrigerators; light fixtures; sensors; signal controllers; solar-powered batt 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; engine cranes; rubber; aircraft parts; test bodies; brake parts; high-pressure hose; seat fabrics; wire rope; transmissions; camshaft crankshafts; cases; wire harnesses; motorcycles; bicycles ...
| Machinery            | Looms; kitchen appliances; machine tools; agricultural machinery; industrial machinery; optical instruments; light fixtures; conditioners; heating appliances; plastic parts for office equipment; control parts; electronic components; material handling equipment; power transmission equipment; power-driven hand tools; internal combustion engines; in-line instrumentation systems; water visu inspection equipment; centrifuges; sewing machines; heat treatment equipment; tanks; water tanks; turbines; condensers; mod engines; vacuum pumps; wafer precision equipment; food products machinery; electric facilities; gas and water-related too 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 par bladers; connecting rods; nuts; industrial precious metal products; drawing alloys; aluminum for beverage cans; blades for cutti machines; gears; metal springs; timer parts; precision gears; aluminum foil; sheet copper; ship plates; drawn copper produc 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 packing materials; coated abrasives; resin hose; coating materials; dental materials; film sheets; ceramic base for electronic part tiles; firebricks; new ceramics; catalysts; paper clay ...
| Consumer goods       | Fermented soybeans; detergent; flour; plastic bags; plastic food containers; plastic models; office goods; fishing reels; microcowa 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; necklace 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 produc polyvinyl chloride; polyvinyl chloride paste ...
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
As a simulation tool for preparing an annual business plan or for production preparation based on 3-month customer forecast data.

Asprova LS : Long Term Scheduler / Asprova MRP
Execute high-precision long term scheduling. Calculate material requirements at ultra-high speed.

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.

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

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.

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.

Rich-featured, ultra-fast logic
Create short term schedules at ultra-high speed. Asprova's production scheduler provides numerous advanced features including 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 manual work.

Skill map
Enter skills of individual workers as a matrix to perform scheduling considering those skills. This greatly eases input and maintenance of 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.

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

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

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.
As an APS system for coordination of forecast with firm orders through synchronization of mid and short term scheduling,

**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.

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### 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.

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### 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

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### Sample output of period KPI

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate KPI(06/09/25)</td>
<td>Evaluate KPI(06/09/25)</td>
</tr>
<tr>
<td>Earnings</td>
<td>$1,536,000</td>
</tr>
<tr>
<td>Material cost</td>
<td>$774,000</td>
</tr>
<tr>
<td>Outsourcing cost</td>
<td>$116,800</td>
</tr>
<tr>
<td>Labor cost</td>
<td>$191,167</td>
</tr>
<tr>
<td>Total cost</td>
<td>$1,081,967</td>
</tr>
<tr>
<td>Profit</td>
<td>$454,033</td>
</tr>
<tr>
<td>Profit ratio</td>
<td>29.5%</td>
</tr>
<tr>
<td>ROA</td>
<td>541.0%</td>
</tr>
<tr>
<td>Sales order LET achievement</td>
<td>100.0%</td>
</tr>
<tr>
<td>Purchase order LET to MRP</td>
<td></td>
</tr>
<tr>
<td>Finished item inventory</td>
<td>$34,000</td>
</tr>
<tr>
<td>Parts inventory</td>
<td>$2,420</td>
</tr>
<tr>
<td>Purchased item inventory</td>
<td>$47,500</td>
</tr>
<tr>
<td>Total inventory</td>
<td>$83,920</td>
</tr>
<tr>
<td>Finished item inventory qty</td>
<td>300</td>
</tr>
<tr>
<td>Parts inventory qty</td>
<td>2600</td>
</tr>
<tr>
<td>Purchased item inventory qty</td>
<td>75500</td>
</tr>
<tr>
<td>Total inventory qty</td>
<td>78400</td>
</tr>
</tbody>
</table>

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 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**

**Customizability**

**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, A purchase 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**

<table>
<thead>
<tr>
<th>Module</th>
<th>Functionality</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GUI / Results</td>
<td>BOM Input</td>
</tr>
<tr>
<td>APS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td></td>
<td></td>
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<tr>
<td>LS</td>
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<tr>
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<tr>
<td>BOM</td>
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<tr>
<td>MES</td>
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<tr>
<td>KPI</td>
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<tr>
<td>DS</td>
<td></td>
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<tr>
<td>NLS</td>
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<td></td>
</tr>
</tbody>
</table>

You can choose modules freely as needed. MES and KPI are not stand-alone modules.

= standard functionality

= can be added