OMPARTNERS

Case Study: Michelin

Keeping the supply chain rolling







Michelin: the company and its activities

Core activity

Michelin is a world leading tire manufacturer, with a market share of 13.7%.

Product lines include: Passenger Car & Light Truck tires, Truck tires, Earthmover tires, Agricultural tires, Aircraft tires, Two-Wheeler tires, Components (rubber and elastomers, reinforcement materials, etc.), Suspension Systems (wheels, antivibration equipment and assemblies), and Tourism Services.

Daily production amounts to 761,000 tires, 42,000 inner tubes, 81,000 wheels and 74,000 maps and guides.

Organization

Headquarters in Clermont-Ferrand, France.
68 production sites in 17 different countries.

Revenue

Consolidated sales of 19.5 billion euros in 2015.

Number of employees

112,300

Context: the typical problems of the tire industry

Making a tire is done in three stages: Casing, Capping and Curing.

- The casing is built up on a drum.
- To obtain a capping, the casing is mounted on another drum. The capping is added and the tire is then inflated to bind the different components together and bring the tire close to its final shape.
- Finally, the tire is cured in a mold. The mold imposes the final shape on the tire and gives it the tread pattern. The curing time, temperature and pressure depend on the size of the tire.

Earthmover tires pose particular problems because of their large dimensions, which make it more difficult to switch from one product to another. Therefore, production has to be arranged in campaigns, with similar products using the same type of material throughout the production chain.

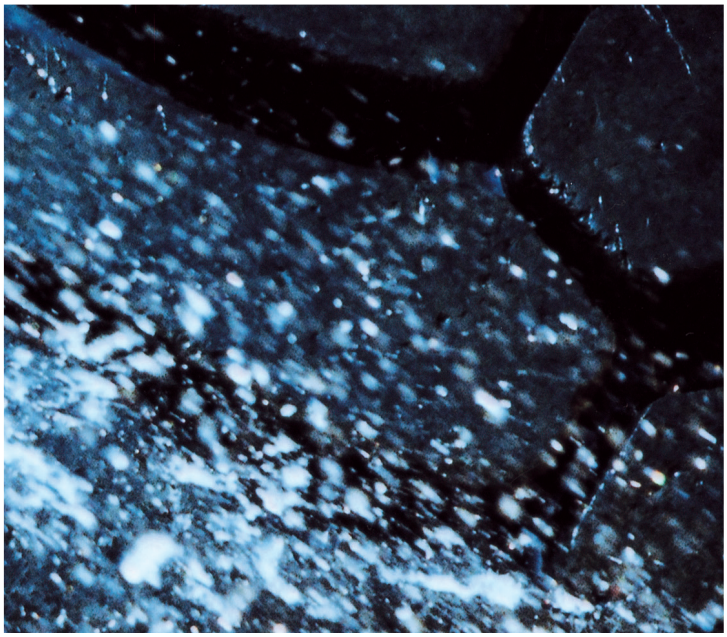
Objectives

The Earthmover product line wanted a planning system that could be shared by the Central Planning department in Clermond-Ferrand and the plant planners in Le Puy and Monceau-Les-Mines (France), Vitoria (Spain) and Lexington (USA).

- The primary objective was to draw up a master production plan with a horizon of four months and a variable level of detail, namely daily for the first month and weekly for the next three months, so as to meet the commitments made to customers for the product line.
- The secondary objectives were to obtain more efficient management of the stock resulting from the campaigns, and to aid with plant planning of the primary machines and resources (casing machine, capping machine and molds).
- Finally, the planning solution had to make the production plan for the different plants visible to all participants in the planning and distribution process.

"The installation of OMP Plus allowed a fundamental increase in supply chain visibility. Thanks to the central database, both central logistics and the individual plants now have immediate access to accurate data at all times."
Arlette Barcelona, Head of Industrial Planning & Supply Chain Quality Assurance





The choice of OM Partners

The solution had to be capable of making optimum use of the available machine capacity, with high occupation and utilization rate. Changing a machine from one product type to another takes several hours and so changeovers should be minimized. The combination of casing and capping machines and presses used for a given production has a great influence on the utilization rates of these machines (e.g. two casing and two capping machines will occupy three presses for 100%, whereas one casing and one capping machine will occupy two presses for only 80% of the available time). The package had to be accessible to several concurrent users with each user having a different view of the same process. There had to be a single, centralized database that was easy to update, with the ability to manage multiple users. Finally, the simulation time had to be short enough to examine various scenarios for the same problem.

The solution provider had to show a track record of innovation and research in software development. The standard solutions had to offer a high degree of personalization, and there had to be a high level of support for development and implementation of the solution. Finally, the company, the product and the service all had to show a good record for stability and reliability. OM Partners emerged as the partner of choice on the basis of all these criteria.

Description of the solution

Planning is carried out at two different levels, respectively by the Central Planning department and the plants:

- Central Planning allocates production to meet demand according to the different types of order (firm orders, netted forecasts in the short term and non-netted forecasts in the longer term), the relative profitability of the products and the capacity of the plants at an aggregated level. The total demand is usually much greater than the available capacity, hence the importance of ensuring that the commitments made are actually met. Sourcing (i.e. which order will be met by which plant) is also decided at this level.
- The plants at the four different sites (Le Puy and Monceau in France, Lexington in the USA and Vitoria in Spain) start on the basis of the choices made by Central Planning, refining the plan down to the level of individual machines on a day-to-day level, taking into account the schedules of the workshops, machines and tools (molds and drums). Any discrepancies between the plant level plan and the central plan are resolved in coordination between these departments.

Planning Solution in OMP Plus – central level

At the headquarters in Clermont-Ferrand, the Planning Solution in OMP Plus and its built-in solver plan the quantities to be produced per period and per plant. The Planning Solution breaks down the commercial requirements according to the type of demand (firm orders and net forecasts) and according to the stock policy (safety stock and target stock), and allocates priorities to each type of requirement. Weighting parameters are then assigned to each type of product, making it possible for different factors to be taken into account simultaneously. These include the costs of “non-delivery” (defined in business terms), margins, product volumes and the relative importance or hierarchy of customers. By summarizing the technical constraints imposed by the plants, using predefined machine configurations and placing limits on the changes that can be made, the solver comes up with a “business-oriented” solution that also complies with the industrial parameters on an aggregated level.

Planning Solution in OMP Plus – plant level

The master plan is refined at plant level by the plants themselves. Each plant receives a sourcing plan expressed in terms of net requirements, and the Planning Solution in OMP Plus in the plant decides on the choice of machines and resources. An “industry-oriented” solver is used to take account of all the constraints specific to the particular plant, as regards the machines, molds, drums, resources, calendar, maintenance etc.

Scheduling Solution in OMP Plus – plant level

On the basis of the plans drawn up by the Planning Solution in OMP Plus, within a horizon of 4 months divided into “week buckets” (week-in-month), the Scheduling Solution proposes detailed schedules within a rolling horizon of 6 to 8 weeks. The built-in solver plans the machine set-ups, taking into account the availability of manpower and the times required for changing from one product to another. It also respects the priorities for the various products involved, based on the sales margins. The production quantities are calculated, and this information is fed back to the higher levels.





Implementation

"The Central Planning department at Clermont-Ferrand is equipped with OMP Plus in multi-user configuration," Arlette Barcelona explains. At plant level, OM Partners had to provide implementations at four different sites. The Le Puy and Vitoria sites each have their own Planning Solution in OMP Plus, while at workshop level the Scheduling Solution in OMP Plus is used. The product changes in the three Vitoria workshops are managed by two different teams of programmers, each using a different OMP Plus. The Planning Solution at the Clermont-Ferrand Central Planning department was implemented as first phase, while the Planning and Scheduling Solution were implemented at plant level six months later." For the Earthmover product line, the Planning and Scheduling Solution are implemented in the Monceau and Lexington plants the following year.

"One of the key factors for the successful collaboration with OM Partners was their personalized approach. We were able to deal with a focused team who had full knowledge of the application and of the philosophy. Moreover, OM Partners proved very flexible in their approach, and very rapidly came up with solutions whenever difficulties arose in the development and deployment of the system."

Benefits

"We now have a robust planning tool for improving the supply chain, with fast analysis for e.g. calculating the impact of commercial decisions. Changes can be displayed immediately, showing e.g. the impact on the supply chain of decisions taken by the plants. There is transparent communication between the central planning level and the plants, with explicit information on constraints and resources, and efficient management of contracts. Finally, we have assured feasibility at all levels, and training time for new planners is reduced", says Arlette Barcelona.

Other implementations for Michelin

Michelin has chosen OM Partners to solve planning problems for other product lines, namely Agricultural (for the world market) and Trucks and Truck Recapping. The installation of the S&OP Solution in OMP Plus in the Agricultural product line led to a follow-up implementation for the Earthmover line. The Planning Solution was installed to deal with sourcing/DRP problems in the Truck Recapping product line. In the latter case, the Planning Solution allocates the sourcing between five different plants in Spain, France (two sites), Poland and the UK, together with ten or so sales organizations in Germany, Austria, the Benelux, Spain, France (four general warehouses), Italy, the Nordic countries, the UK and Switzerland.

Conclusion

Arlette Barcelona sums up the advantages: "Before the OM Partners software package was introduced, the various players within the supply chain did not use the same planning tools. Now, with OMP Plus the plants and the Central Planning department share the same planning platform and the information is available to everybody."

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