Press Release

Madrid, Spain, June 21, 2006. The ABB plant at Zaragoza has been awarded with the ELA Award for its project "Diviner 3.0 – Planning in the field of Chaos". In awarding the accolade, the panel took special note of the project's *"innovative application of Theory of Constraints to production planning."* ABB has shown that a Supply Chain can be planned and controlled letting the bottleneck shift along the different processes that compose it.

Origins

In February 1999, the Asea Brown Boveri, S.A. (ABB) facility at Zaragoza was designated a "Focus Factory" for the manufacture of dry transformers in Europe. As the plant was manufacturing under an Engineering-To-Order environment, the key challenge was to gain a competitive edge based on speed. This would enable the ABB factory to fend off the threat of outsourcing by dint of swift delivery times. Moreover, this speed could not be achieved at the cost of making the plant oversized, because the company had to compete with small workshops in Europe running at lower overheads.

Taking account of those three converging factors (ETO manufacturing, speed and volume comparable to series manufacturing, and the need to attain high efficiency in resource use to minimise costs), ABB Zaragoza set itself the goal to find the way to reduce the necessary protection capacity without hurting the performance and reliability of the whole chain and, in addition, coping with the high degree of independence between process' cycle times through tighter adjustment of capacity across chain links (this could mean the bottleneck may move due to backlog variability!).

ABB Zaragoza, then, devised a powerful tool, with a simulation engine inside, that allowed for proactive management of movable bottlenecks in the Supply Chain.

So the key was to plan and control a supply chain where the bottleneck could be shifted across processes, and protection capacity was lower than that posited by current theory. The aim was to predict the behaviour of the system in response to the deviation brought about by the backlog. Using the simulation, the future performance of the supply chain could be analysed to anticipate events and adjust protection capacity only against natural variability. The theory gave rise to this new tool, developed at the ABB Zaragoza plant, for Supply Chain planning called Diviner 3.0. The application uses simulation to predict the behaviour of the chain, take steps in advance and operate proactively instead of reactively: make the right decisions before events come about.

One of the supporting principles for the physical implementation of the project was the "Visual Factory" concept. This involves a manufacturing layout that lets the manager see at a single glance what the state of progress is, where the bottleneck is located at the given time and whether a given material is available.

For ABB Zaragoza, "optimum planning isn't just about giving each link in the chain a specific deadline: you need to tighten the flow of the chain as a whole and shed stocks to achieve the overriding goal: speed!"

Optimum performance

The key difference from traditional ways of applying the Theory of Constraints to production planning hinges on the bottleneck concept. Diviner keeps an eye on processes that are not bottlenecks today, but may become such in future. Using the simulation, Diviner 3.0 evaluates a range of scenarios to determine optimal resource allocation and get the best possible performance from the chain as a whole. Diviner monitors the entire Supply Chain, not just production.

After a benchmarking of ABB Zaragoza's manufacturing lead-time with its twin plants in Asia and America, it turns out that the Zaragoza facility's lead-time is less than half the second-fastest facility in the Group (in Korea), and less than a third of the lead-time of the US plant. The project leaders say that their lesson from the experience is that *"if there is a belief in an organisation for a need to change something, one must not be afraid to so, in spite of the bad omens of the "oracles" and the typical doubts of the self-assured pseudo-experts."*

With the introduction of the new system, the ABB Zaragoza plant has achieved spectacular results with respect to 1999 with cycle time reductions to one fourth compared to 1999 leading to highly increased sales and exports levels.

ABB (www.abb.com) is a global leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group operates in more than 100 countries and employs around 105,000 people.

In Spain, the ABB Group has various production facilities at Bilbao, Oyarzun, Cordoba, Madrid, Barcelona and Zaragoza which manufacture and sell Distribution and Power Transformers, Low, Medium and High Voltage devices, Industrial Machinery, Robots, and more.

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