

SOCIAL INNOVATION

Manage your factory by focusing on your human capabilities

**Semiconductor manufacturer e2v
manages its employees with the Theory Of Constraints (TOC),
a way of organizing production**



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Using DBR the production work load is translated into a “human capabilities” work load

A hundred workers work in the factory, but 200 skills go into making the products: not surprising that managing expertise [or capabilities] has become a priority for e2v, a manufacturer of electronic components for the latest high technology applications such as the sensors for the Hubble telescope. “You have to admit that our site in Grenoble has very diversified production,” says Bruno Wirth, the Managing Director of e2v Semiconducteurs, employing 330 persons with 100 million Euros in annual sales. “We make various lines of sensors and hardened microprocessors, which must be assembled, placed in casings and tested according to the specific processes of each of our market sectors (space, military, medical and so on).”

In 2008, the traditional methods for planning had met their limits. “As long as demand was stable, everything was OK, but the slightest changes caused problems” remembers Cédric Stien, manager of the supply chain

and customer service. “Of course, we couldn’t ask the client to wait nine months, which is the amount of time needed to recruit and train someone.” So the company had to find a way to better exploit the expertise of its employees. Production managers in e2v decided to apply the Drum-Buffer-Rope method. This method comes from Dr. Eliyahu Goldratt’s Theory Of Constraints and had already been applied successfully to the factory production the year before. “At that time, our testing machine was the constraint limiting the global capacity of the factory” explains Bruno Wirth. “We had set the workshop rhythm to that of the testing machine (the drum), then we placed inventory before [...] the machine to absorb variations in the upstream flow (buffer), and we would only release new production when the buffers reached a certain limit (rope).” As a result customer due date performance went 75 % to 97%.

A NEW VERY ORIGINAL METHOD

The same principle therefore was applied to planning, with expertise management as the constraint. “This is the first time in the world that the drum-buffer-rope method has been applied to managing expertise” states Jérôme Colin, consultant specialized in the theory of constraints and who has run two projects at e2v. They developed a system called “Capabilities DBR” [Le DBR des compétences], a drum-buffer-rope software applied to expertise management. The software originally managed production load in the Enterprise Resource Planning system (work orders), this was translated into work load per type of expertise. “We start by assigning workers to the area which most our expertise is the rarest, because, if we run into problems at these work stations this would block the production of the whole factory”, commented Cédric Stien. “Then we do successive iterations so that, in the end, we are sure that we have enough people to fulfill our orders.” The subtlety of the system is in assigning the workers with the rarest skills last. Those called the “red hats” would then adjust be used to absorb the variations (the buffer of the drum-buffer-rope). As these workers are given work in non-critical areas, they are free for rapid redeployment.

By better absorbing variations, e2v has cut cycle production time by 30%. Now the company can offer “rush production” services (accelerated production on demand). “Since setting up the “Capabilities DBR” [Le DBR des compétences], there is less stress in production because the managers of the Autonomous Production Units (APUs) are never taken by surprise, says Cédric Stien, satisfied. The APUs now have solid arguments to justify their training and hiring programs.” This project not only benefits managers; the workers use the software too. While supporting their unit, they get to have planning and management experience as well. So to as workers observe the problems involved in managing the various skills in production it allows them to improve their own skill set.



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