TKI DINALOG
Dutch Institute for Advanced Logistics

IMPROVING PRODUCTIVITY AND PREDICTABILITY

ROAD TO FULL SERVICE PREMIUM

Factsheet of ProSeLoNext Project in ASML

Full Service is a set of practices of risk management. It provides the guarantee that ASML will take care of almost everything of customer service, including scheduled and unscheduled downs. Depending on the service level, it starts with Full Service Mature that defines target uptime, then Full Service Baseline that secures guaranteed uptime, and finally Full Service Premium that achieves enhanced uptime. Our case focuses on Full Service Premium (FSP), which targets at both productivity (higher per-system availability to enable higher output) and predictability (less variations among systems), so that it can guarantee system performance. Through system dynamics modeling, we identify different roads to achieve FSP, and present corresponding policy suggestions.

RESEARCH STEPS

Individual interviews were first applied to managers in Customer Supply Chain Management, Customer Support, Business Line DUV Marketing and System Engineering, to collect information, data and assumptions on FSP practices. Several group modeling sessions were then organized to invite these managers to sit together to make clear research questions, identify scenarios and improve and validate the model.

MODEL ILLUSTRATION

The structure of our model is shown in Figure 1. There are three building blocks in the model. The first one (i.e. the largest square in Figure 1) illustrates the mechanisms of scheduled and unscheduled downs. For a scheduled down, the machine will experience two phases, namely Repair and Recovery, to turn back to work. While for an unscheduled down, the machine will experience Diagnostics, Down Time Waiting for Parts/Tools (DTWP/T), Repair and Recovery, in total four phases, to turn back to work. When executing Repair or Recovery, the machine has certain chance to fail again, so that a new round starting from Diagnostics will apply. The second building block (i.e. the square at the upper left corner of Figure 1) calculates the uptime percentage, which reflects productivity. The third building block (i.e. the square at the lower left corner of Figure 1) presents the benefits calculation, which represents predictability.

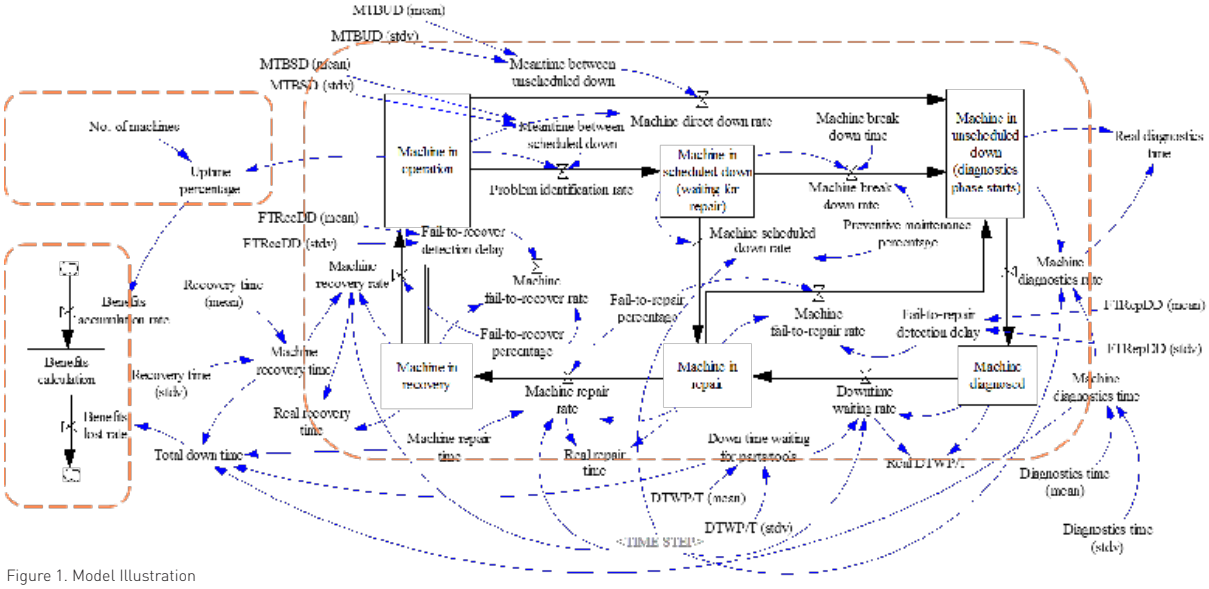

Figure 1. Model Illustration

2 is to improve Diagnostics phase. Scenario 3 is to improve Recovery phase. Scenario 4 is to improve DTWP/T phase. Scenario 5 is to consider the interactions between Scenario 2 and Scenario 4. And Scenario 6 is to improve Mean Time Between Interrupts (MTBI). To achieve better results, different scenarios are then combined for a further analysis.

FINDINGS

For individual scenarios, Scenario 1 and Scenario 3 have achieved significant results on both productivity and predictability improvements. Scenario 2 has a significant improvement on predictability, while Scenario 6 have a significant improvement on productivity.
For different combinations, we find that the best way is to combine Scenario 1, Scenario 3, and Scenario 6. According to the amounts of improvements, the sequence should be first Scenario 1, then Scenario 3, and last Scenario 6. While considering the investments on the improvements of different scenarios, the most achievable way is to combine Scenario 3, Scenario 5, and Scenario 6. According to the amounts of improvements, the sequence should be first Scenario 3, then Scenario 6, and last Scenario 5.

POLICY SUGGESTIONS

To gain the most improvements on both productivity and predictability, ASML needs to combine the best practices of Scenario 1 (turn unscheduled down to scheduled down), Scenario 3 (save 50% of current recovery time), and Scenario 6 (increase 50% of current MTBI). According to the amounts of improvements, the sequence should be first Scenario 1, then Scenario 3, and last Scenario 6.

While to balance the improvements and the investments for such improvements (which are mostly unknown for this research), the most achievable case is to combine the most achievable practices of Scenario 3 (save 25% of current recovery time), Scenario 5 (save 25% of current diagnostics time while considering the overlap between diagnostics time and DTWP/T), and Scenario 6 (increase 25% of current MTBI). According to the amounts of improvements, the sequence should be first Scenario 3, then Scenario 6, and last Scenario 5.

Topsector Logistiek

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