

BOOSTING BUSINESS FOR OCÉ AND ITS CUSTOMER WITH CONDITION BASED MAINTENANCE

How to make it happen?

Océ is a global leader in graphic arts, industrial printing and collaborative business services. Nowadays, more and more Océ machines are in operation with customers that offer extensive condition monitoring facilities (“Sense and Support”). Condition based information can be collected, so that a maintenance plan can be proposed to the customer before a breakdown happens. Condition based maintenance (CBM) can be arranged on less busy days. Its performance is more predictable and much better than corrective maintenance. In this study, we develop models to elaborate the ways how both Océ and its customer can boost business via CBM practices.



MODEL ILLUSTRATION

We used system dynamics as our modeling technique. Taking Figure 1 as an example, system dynamics uses primarily stock (in a rectangle) and flow/rate (above or under a valve) variables to represent the dynamic behavior of complex systems. In essence, a stock variable defines the state of a system over time, while a flow/rate variable directly changes the rate of evolution of a stock variable. The source and sink are represented by a cloud symbol. The source represents systems outside the boundary of the model, while the sink is where flows terminate outside the system. The source has an arrow coming out, while the sink has an arrow going into the cloud. The “||” symbol denotes a delay, which means the cause needs a lead time to generate the effect.

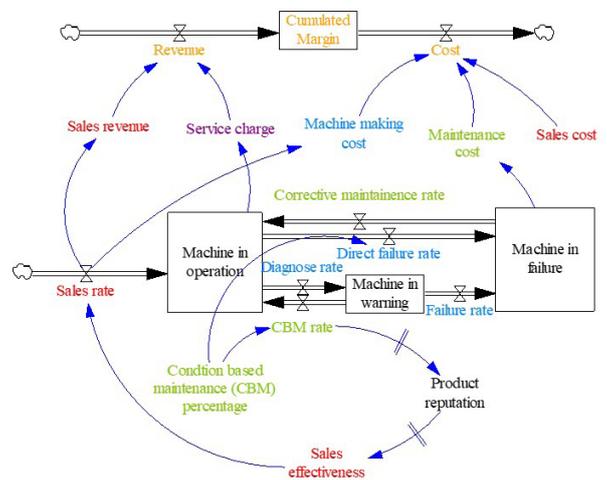
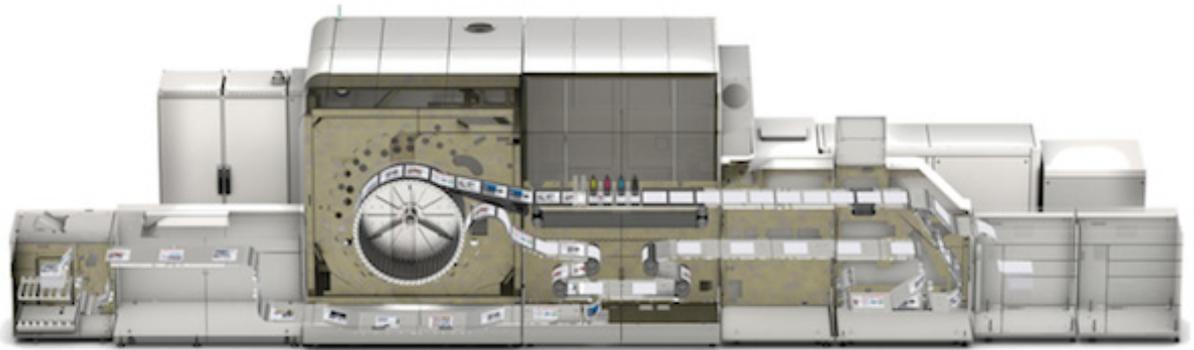


Figure 1. Simplified model (Océ)



Five departments/functions (i.e., sales, R&D, maintenance, service, and finance) are interacted in the model for Océ (Figure 1). "Cumulated Margin" is the accumulation of margin in every week. It is determined by the speed of both "Revenue" increase and "Cost" consumption. Briefly speaking, there are two sources for "Revenue" increase and three sources for "Cost" consumption. "Revenue" is generated by selling machines ("Sales revenue") and service/consumables ("Service charge"). While "Cost" is formed by making/installing machines ("Machine making cost"), maintenance ("Maintenance cost"), and sales staff/training consumption ("Sales cost").

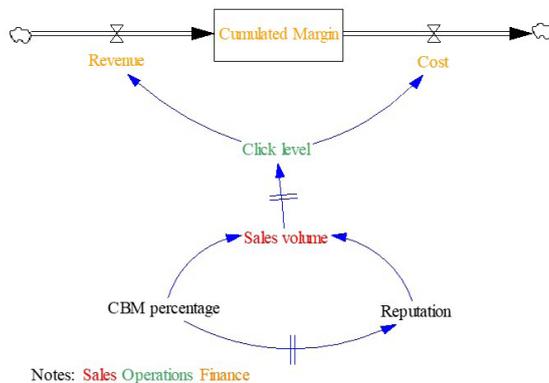


Figure 2. Simplified model (Océ's customer)

Figure 2 illustrates the model for Océ's customer. Here, Océ's customer refers to a publisher that uses Océ's printer to print magazines, posters, and other commercial products. Again, customer's "Cumulated Margin" is the accumulation of margin

in every week, and is determined by the speed of both "Revenue" increase and "Cost" consumption. Both "Revenue" increase and "Cost" consumption are decided by "Click level", which is influenced by "Sales volume" with certain lead time. The increase of "CBM percentage" can directly affect "Sales volume" in a short run. Its impact can also be indirect, through the improvement of "Reputation" with certain lead time.

SIMULATION RESULTS AND POLICY SUGGESTIONS

For Océ, the revenue increase is mainly from the increase on "Ink charge" (i.e. customer's ink consumption per week, a part of "Service charge"), while the cost decrease is mainly from the decrease of both technicians' cost and experts' cost, which are parts of "Maintenance cost". For Océ's customer, the increase on "Revenue" is the reason for the increase on its "Cumulated Margin".

The margin increase for Océ's customer is more significant than that for Océ, which may become a reason for re-negotiation. Our suggestion is that Océ can increase "Weekly charge" (i.e. service fee per week, a part of "Service charge"), so that Océ can gain more "Revenue" and therefore more "Cumulated Margin". While for Océ's customer, such increase will lead to an increase on its "Cost", but if the increase on its "Revenue" is more than that on its "Cost", the increase on its "Cumulated Margin" will remain positive. In this case, Océ's customer will still benefit from CBM practices. A balanced improvement on "Cumulated Margin" will motivate both parties to collaborate for CBM practices.



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