Process Flow Analysis and Activities Scheduling at Bombardier Painting Workshop

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1 Abstract

Following a request made by Bombardier-Crespin team, concerning the activities scheduling on their painting workshop, we develop this study to answer their questions and contribute to the bridging between university and industry in France. The Bombardier team objective is to implement a lean strategy that helps managing the concerned workshop and respect the impose "Takt-time". Thus our mandate consists in performing a lean manufacturing value flow analysis to improve the painting processes, the planning (scheduling) and thus assure customers' satisfaction.

The workshop is large, the flow is complex and the layout is fixed and imposed! Thus handling the number of contracts to be processed, the scheduling, the throughput, the organization of the drawn flow and the management of the progress is quite complex and difficult to study manually. The aim of this study is to propose a tool, a simulation model, which well represents the functioning of the workshop. This simulation should allow our client to test several scenarios and answer his current questions, namely: Do we have the capacity to meet the demand? What is the throughput of the workshop? Do we respect the "Takt-time"? Is there a better sequence of products to be applied at the shop entrance to better use the resources and meet the demand? What is the utilization rate? What are the bottlenecks?

We start with a "Gemba walk" to understand the problem and get real view of the shop, and then we map the entire process to simulate. This representation should make it possible to carry out a simulation of the dynamic flow of the workshop, check its capacity and find how to improve it.

We used Arena to simulate the painting Workshop. The simulation model helps us to study the process flow and address the client questions. OptQuest solver is also used to answer the scheduling question. We find the impact of the job sequence on the flow and the performance of the shop.