USING A CLOUD-BASED SIMULATION TEMPLATE TO DELIVER LOW-COST SIMULATION FOR CRAFT BREWERS

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ABSTRACT

Craft Brewers are a major SME sector worldwide. These SMEs could benefit from using simulation to improve their production. However, simulation is often far too expensive for these small enterprises. Using a cloud-based version of Simul8 developed on the CloudSME Simulation Platform, this case study describes a new cloud-based simulation template technology that can be used to deliver low-cost simulation to Craft Brewers. The tool enables an effective delivery schedule to be created that considers future orders and forecast as well as testing the robustness of allocations with respect to variations in consumption times and demand forecasts.

1 INTRODUCTION: CRAFT BREWERS

Craft Brewers, or Microbrewers, represent a major SME sector in Europe and North America. One of the key quality objectives shared by Craft Brewers is to ensure that their products are consumed in an optimum time window (typically across a few days). The implication is that beer consumed outside of this window is either too young or too old to be at its very best and therefore does not deliver an ideal customer experience. All beers have unique characteristics. These characteristics encompass numerous factors and the age at which cask conditioned Craft Beer is at its best varies from product to product. When faced with multiple product lines with different optimum time windows and multiple outlets, the scheduling of brewing processes and timely procurement of raw ingredients can be very complex and time consuming.

Large-scale breweries use discrete-event simulation software to support the delivery of efficient production schedules. Indeed, the use of simulation to support similar decision making in Craft Breweries is attractive. A model could be used to support intelligent decision making at the dispatch warehouse that will maximize quality by maximizing the potential for a cask to be opened when the beer that it contains is at its ideal age. However, simulation is expensive and even a fairly straightforward project could be beyond the financial reach of a craft brewer. If Craft Brewers are to benefit from simulation, some approach to delivering low-cost simulation is needed. We present a cloud-based simulation template technology that is being used to delivery low-cost simulation to Craft Brewers.

2 A CLOUD-BASED SIMULATION TEMPLATE TOOL

The CloudSME project (www.cloudsme.eu) has developed the CloudSME Simulation Platform to facilitate the development of cloud-based simulation services across a range of applications and paradigms. The Platform supports workflow, high performance computing and cross-cloud portability (Taylor, et al. 2014). The Simul8 Corporation (www.simul8.com) has used the Platform to develop a cloud-based ver-
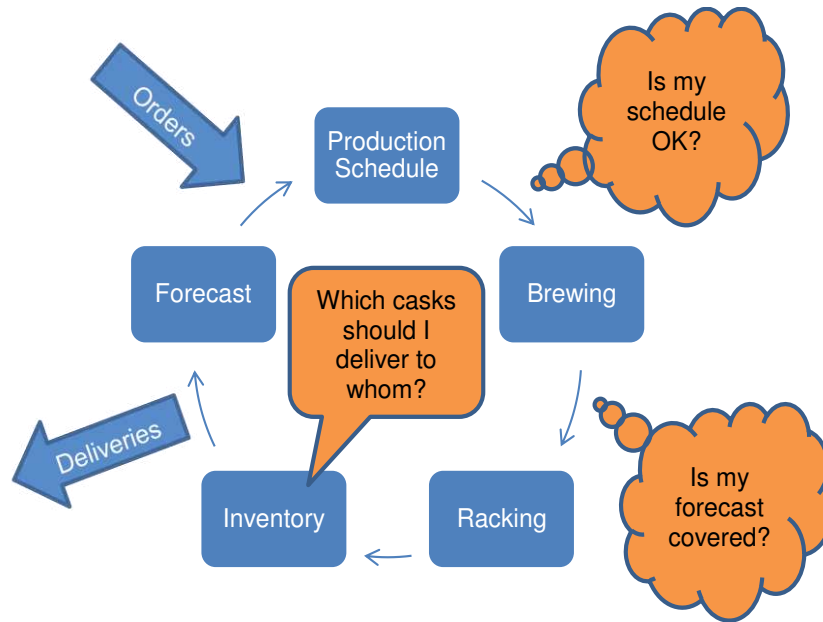
Figure 1: Craft Brewery Conceptualization

sion of their Simul8 software that uses multiple cloud computing resources in parallel to speed up discrete-event simulation experimentation. This Software as a Service (SaaS) implementation also means that the Simul8 software can be used by another application as part of a cloud-based service.

Saker Solutions has created a cloud-based simulation template service that uses this Simul8 SaaS implementation to create simulations. As shown in Figure 1, the craft brewing process is fairly straightforward. On this basis a simple reconfigurable model, or template, has been created that can be configured for the multiple product lines of a Craft Brewer. Using a web-based front-end, data on a craft brewery is uploaded to the template server. The template server then uses the SaaS version of Simul8 to create the simulation of the specific craft brewery. Simul8 then uses the services of the CloudSME Simulation Platform to run the simulation of the craft brewery on a cloud. This enables an effective delivery schedule to be created that considers future orders and forecast as well as testing the robustness of allocations with respect to variations in consumption times and demand forecasts.

3 SUMMARY

This case study has described a low-cost cloud-based simulation template tool for Craft Brewers. The tool has been deployed at Hobsons Brewery, a Craft Brewer based in Shropshire, UK. The results of this work will be presented at WSC 2015.

ACKNOWELDGMENTS

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