

CRAFTBREW: EXPERIENCES OF DEVELOPING A LOW-COST BREWERY MANAGEMENT SYSTEM WITH CLOUD-BASED SIMULATION

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ABSTRACT

This paper describes on-going work that aims to support decision making in the Craft Brewing, or Microbrewing, industry, a major SME sector in Europe and North America. The aim is to assist Craft Brewers to ensure that their products are consumed in an optimum time window. We previously demonstrated how cloud-based simulation could provide low cost access to simulation using a template approach based on the CloudSME Simulation Platform. In this paper we give an overview of CraftBrew, the whole brewery management system that we are building around the cloud-based simulation approach to support other aspects of the brewing process.

1 INTRODUCTION

Kite, et al (2015) introduced the concept of using cloud-based simulation to support decision making for Craft Brewers, or Microbrewers, a major SME sector in Europe and North America. The motivation is to help Craft Brewers to ensure that their products are consumed in an optimum time window. Large-scale breweries use discrete-event simulation software to support the delivery of efficient production schedules. In the 2015 case study, we demonstrated how cloud-based simulation could provide low cost access to simulation using a template approach based on the CloudSME Simulation Platform (Taylor, et al 2014). In this paper we give an overview of CraftBrew, the whole brewery management system that we are building around the cloud-based simulation approach to support other aspects of the brewing process.

2 TOWARDS CLOUD-BASED BREWERY MANAGEMENT

Figure 1 shows the conceptualization of the CraftBrew Whole Brewery Management System. This consists of a web-based frontend, a Business Intelligence Module (BIM), a Process Control Module (PCM), a Data Acquisition Module (DAM) and a Data Warehouse. The BIM performs the supplier/customer relationship management function and develops profiles for each in order to understand supply/demand profiles across beer product to raw materials. The BIM may use on-demand simulation to build production schedules for the PCM that account for variances in consumer and supplier behaviour across the supply chain and actual production status. It also has a mobile app that facilitates data capture with consumers. This dynamic forecasting technique can deliver a far more robust production schedule than what is currently available (i.e. current systems do not account for stochastic demand/production behaviour – the assumption is that brewing takes a standard amount of time per product line and clients will take a fixed quantity of beer and consume it over a fixed timeframe). Beer has a best consumption window and, factoring this into the production schedule, can be used to drive production and waste optimization across

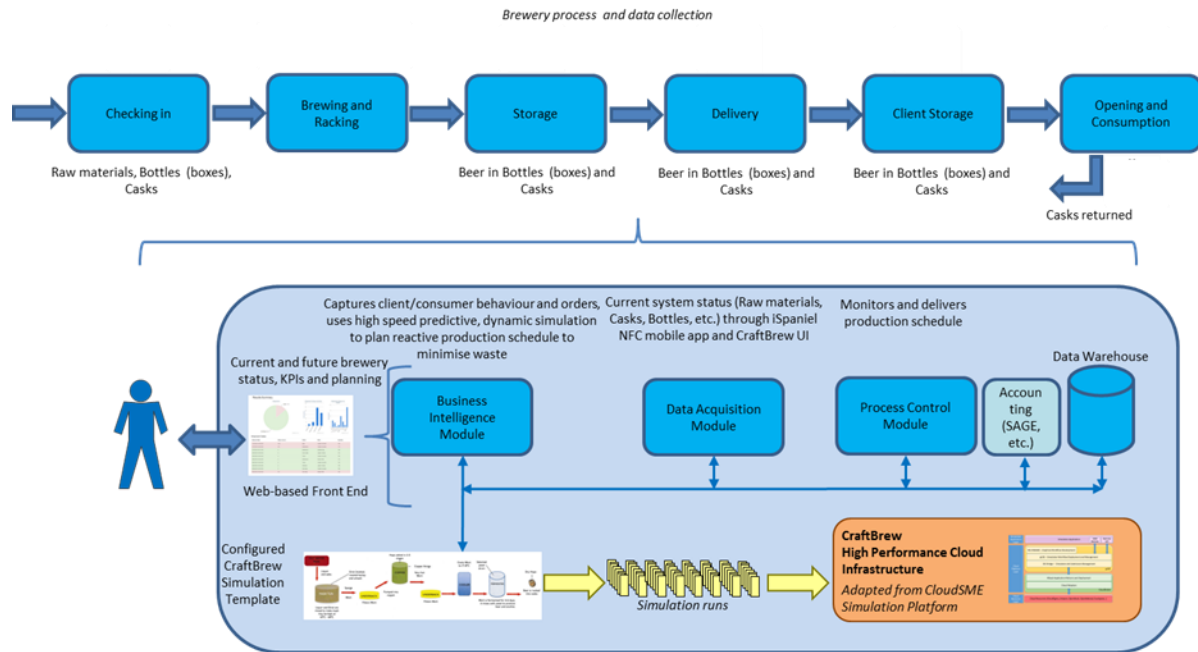


Figure 1: CraftBrew Conceptualization

multiple product lines. The PCM will monitor actual production (by form-based data entry) and will have a quality control function that will monitor, track and alert quality issues. It will also have the capability to plan the daily delivery schedule. The PCM will therefore feed into the BIM to update actual production behaviour. This will interface with the DAM (incorporating a mobile application) to give tightly coupled data on the current status of the supply chain and will feed into the BIM and PCM. All data will be stored in a cloud-based data warehouse and the overall system will interface with commonly used accounting systems in use in the sector (e.g. SAGE).

3 SUMMARY

This case study has described the CraftBrew Whole Brewery Management System. The system is being tested at Hobsons Brewery, a Craft Brewer based in Shropshire, UK. The results of this work will be presented at WSC 2017.

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