

Delivering the Perfect Glass of Beer: SABMiller Sets New Standards for the Beer Industry

Ibahi, South Africa — Some call it Liquid Gold or the Nectar of the Gods. Benjamin Franklin said that its mere existence is "proof that God loves us and wants us to be happy."

Beer has been a staple of the human diet for at least 4,000 years. The Egyptians made it from barley while Babylonians made it from wheat and in the Americas the Incas made it from corn. Our oldest records of beer are Sumerian, from near the region of the world's earliest domestication of cereal. Men and women of all classes drank beer. It was so important that in the Code of Hammurabi (18th century B.C.), the oldest written set of laws, owners of beer parlors who overcharged customers were to be put to death by drowning.

Today, the brewing of beer has grown into a global industry worth billions of dollars and the process itself has been refined into a stringent art form with critical standards at every point along the production process.

SABMiller plc is the world's second largest brewing conglomerate and - with the commissioning of its Ibahi brewery near Port Elizabeth, South Africa - is setting new production standards for the entire industry.

Completed in a record 18 months from groundbreaking to full production, the Ibahi brewery makes use of the latest process and production management, and integration solutions from Wonderware to become the defacto industry standard for manufacturing capability, manufacturing systems, organizational design and asset care.

"The three key business benefits that SABMiller is looking for in any solution it tries to roll out across its facilities are: speed, flexibility and interoperability," says Thinus van Schoor, Automation Manager, SABMiller. "It's critical to the business to have the right mix of speed and flexibility for the market it serves. The third important element, interoperability, is a challenge because of the variety of different platforms and systems we use in each brewery. These systems must all have the migration ability to integrate to each other and to the information systems on top in order to enable maximum efficiency out of the facility."

To that end, SABMiller decided on Wonderware software systems, as represented by Futuristix, the Wonderware distributor in South Africa, to help make the process control at Ibahi as state of the art as the brewery itself.

Says van Schoor, "The suite of products we are using in the brewery includes the InBatch product, which provides us with the recipe functionality and enables the brewer to manage his recipes in a more precise way. Also the InTrack product gives us the genealogy across the product to be able to track problems back to the source."

"We chose the Industrial Application Server because it's flexible, scalable, can cope with diverse systems, and will help us implement our standards."

Graeme Welton
SABMiller plc

Rounding out the solution are InTouch software, which provides visualization and operator interface, and the IndustrialSQL Server historian, which is used for trending and analysis of the day-to-day operations of the brewery. These Wonderware products help operators and management alike to visualize, analyze and optimize each step of the brewing process providing managers with the intelligence and control required to be competitive.

These tools are tied together by the Universal Work Station, one of the core strategies in use at the Ibahyi brewery. The Work Station was developed by SABMiller and its integration partners and uses Wonderware technologies, among others, to provide an integrated view of the operations of the business, management, and process control levels.

Because personnel can interact with the total system from various points in the brewery, the output of the brewery itself and each worker consistently earns Ibahyi the position as SABMiller's most efficient and low cost brewing site in the South African division.

SABMiller Pioneers with ArcestrA Technology

The challenges inherent in today's Consumer Goods markets are as varied and strict as those facing the brewer as he plies his art in an attempt to turn out that perfect glass of beer.

Product quality is only the first of these. Once you capture a customer base with a high quality product you have to maintain it, and the only way to do that is to maintain the quality levels you won it with in the first place. Product consistency leads to sustained growth while production efficiency is directly linked to the bottom line and capacity utilization is an integral ROI measure.

SABMiller faces the additional complication of a diverse spread of manufacturing operations and market demands, varying degrees of existing automation and a huge diversity of control system hardware platforms and software environments.

"The chain of events that would enable us to meet these challenges started with the implementation of Ibahyi brewery in 2000," says van Schoor. "Ibahyi would become our blueprint for excellence. In the same year, we started a program for the definition of standards, which was designed to maximize ROI of plant and operational assets. This led to a list of requirements and a search for a solution that matched these requirements. ArcestrA technology from Wonderware was chosen as a

pilot because of its potential to address our needs for standardization, rapid and flexible deployment, change management and application integration. We became a Beta test site for the ArcestrA software architecture and implemented it at our Midrand training institute to investigate if it could live up to our expectations."

With its on-site brewery, computer center and sophisticated laboratory and classes, Midrand has been a center of modern learning for the brewing industry for Africa and abroad since 1987. Product testing has been one of their regular activities and Wonderware and Futuristix are active Institute sponsors - factors which combined to make it an ideal site for a pilot program.

The ArcestrA architecture extends the life of legacy systems while preserving previous investments in hardware, software and intellectual property. Built on an underlying platform of Microsoft's .NET infrastructure, the ArcestrA architecture is designed to optimize the integration of disparate solutions, develop and maintain standards and - in the process - cut engineering costs by 35-50 percent while improving efficiency and performance throughout a plant. The ArcestrA architecture delivers a highly productive, standards-based, multi-language environment for integrating systems with next-generation applications and services. It also extends platforms to meet the stringent requirements of industrial automation environments, while cost-effectively eliminating islands of automation throughout the operation.

To succeed at Midrand, the ArcestrA architecture needed to support operational excellence and market demands through scalability and flexibility. It had to be adaptable and re-configurable while providing ease of maintenance for lean manufacturing purposes. It also had to accommodate the reuse of application engineering in order to minimize duplication and promote the introduction of standards across a variety of projects.

Finally, because SABMiller plants run on a variety of platforms and software, including programmable logic controllers (PLCs), Wonderware plant intelligence software and other software, the ArcestrA architecture had to integrate different vendor offerings in order to provide true interoperability.

According to Andrew Downes, a brewer with the Midrand Training Institute, the pilot was an unqualified success. "Before we started using the Wonderware systems here at the training institute, each plant had its own system and you couldn't go from one brewery into another and just take up the reins. You had to learn their SCADA system, their interface, before you could operate

the plant. With the new Wonderware system you can go from one plant to another and everything looks and feels the same."

The migration from the training institute's existing SCADA implementation to the ArcestrA architecture involved a series of seven steps:

1. Creating object templates using SABMiller's divisional standards (to 'model' each object, including its operational attributes, I/O characteristics, alarm conditions, performance history, PLC addressing requirements and many others. An object can be a device like a pump or valve or can constitute any number of such devices in a connected system).
2. Defining an area model for each section of the 'plant' or microbrewery at the institute following the S88 standard to model the process.
3. Creating object instances (where the defined objects are used) and storing these in the ArcestrA architecture's 'galaxy' repository. The galaxy can constitute a connected network of physical and/or logical servers of any size where data is shared and selected functionality can be 'dragged and dropped' to servers at will to more evenly distribute the computing load.
4. Creating the Deployment Model, which included Platform Objects (participating computers), Application Engines (which host and execute application objects) and OPC client objects, and placing areas on engines.
5. Converting the InTouch SCADA application from its native mode to the ArcestrA environment. This required replacing tag server references with galaxy references, writing scripts and specifying animation links. (An optional step, yet strategic for SABMiller, as it afforded them the opportunity to prove out and capture the issues associated with migration from Tag Servers to the Wonderware Industrial Application Server.)

6. Thin-slice testing, which included "hot" testing and deploying one object from every device type at a time in order to minimize any impact on the microbrewery. Mistakes were corrected at the template level, which meant that the re-deployment of corrected objects was very rapid.

7. Deployment - which occurred live - and final testing.

The pilot really drove home the importance of having an accurate definition of standards, including naming conventions and the definition of object classes, says van Schoor. "Something else that was highlighted was the necessity for up-front planning. These are all requirements that are vital to every project. But, until now, there hasn't been a framework to enforce or capitalize on them, with the result that every project is normally implemented from scratch and duplicated at expense.

"The migration to the ArcestrA architecture proved easier than we thought, and we now have a tool that we have adapted to our specific requirements and that will ensure conformance with standards, while minimizing engineering costs far into the future. The next step is to use it on a full-scale project, and this is currently in progress."

With Ibahyi providing a blueprint for best practices, Invensys' Wonderware software and the ArcestrA architecture are all working seamlessly on the Microsoft .NET platform at the Midrand Training Institute's pilot program, SABMiller is poised to continue setting new global standards for excellence in one of civilization's oldest industries.



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Wonderware • 26561 Rancho Parkway South, Lake Forest, CA 92630 • Tel: (949) 727-3200 • Fax: (949) 727-3270 • www.wonderware.com