

Food and Beverage

DT Analyst software, Production Events Module, Wonderware Enterprise Integration Application, Wonderware System Platform **Arla Foods**

Automated traceability at Arla Brabrand

by Wonderware Scandinavia

“At Arla Brabrand Wonderware solutions have resulted in an increase of line efficiency of 5% on the machines on which they are implemented. We have been able to reduce overtime work, i.e. we pay for less working hours and the staff no longer has to work overtime. Now we can handle production within normal working hours.”

Rita Hornsleth, Production Manager, Arla Brabrand



Company Overview

Arla Foods – Brabrand, Denmark

The Arla dairy in Brabrand near Århus is the largest in Denmark producing sour milk products. It has 160 employees. The products are sold in Denmark and abroad. The dairy makes a total of 29 different basic products in various types of cups and cartons with up to 97 different types of fruit. Since January 1997, the dairy is also producing sour desserts such as Yoggi Yangster, Postman Pat and Scooby-Doo. Most of these products are exported to England. Arla Foods is a certified supplier to NASA. Here, Arla Foods Brabrand delivers yoghurt with blueberries, raspberries and vanilla flavour.

At Arla Brabrand the use of Wonderware solutions goes back a few years. All the dairies were invited to participate in a workshop on production IT organised by Arne Svendsen, Arla Foods, Corporate Production IT Manager, where various automation products were demonstrated. Both large and small products were included. Wonderware’s product was in between and very easy to work with. You get the functionality required and not a lot of things that you have no use for. The product lived up to Arla’s expectations. The price of the product was also at an investment level that the individual dairies could afford. A line was found where both small and large dairies could participate.

Today, Arla Brabrand uses Wonderware Historian (formerly known as IndustrialSQL or InSQL), Wonderware Application Server, DT Analyst software, Production Events Module (now part of Wonderware Equipment Performance Module) and Wonderware Enterprise Integration Application.

Integration to SattLine

Arla Brabrand implemented SattLine as their DCS system (Distributed Control System) in 1994 at a time when they hardly knew what S88 was. As it became more and more known they started wondering whether it could be implemented, as the dairy had not been designed for it. With the ArchestrA technology in Wonderware Application Server, Wonderware’s Production Events Module, and after some necessary changes in the SattLine program, the logged data was similar to data from an S88 production. Technically, an interaction with SattLine is used to connect Wonderware Application Server to the production. It has involved a lot of work to validate that the right data is used.

The amount of data being transferred at Arla is not gigantic. Every time they start and stop a batch, data is retrieved and maintained in production until production ends, and the data is then transferred in a group to the Wonderware Application Server where it is split up.

“The actual integration was simple in terms of making the systems communicate”, says Lars Østrup from the ÅF Group. “The challenge was to describe what needed to be collected. We have implemented modules in SattLine and Wonderware Application Server that communicates. SattLine collects data and buffers it to a certain extent, if required. The data is sent to the Wonderware Application Server when each batch is finished. Then, the data is used for reports and tracing.”



Filling line for Yoggi Yoghurt

Arla Brabrand registers and analyses data from the moment the milk transport unit delivers the milk. At arrival Arla Brabrand already knows the name of the driver, tour number, route number and type of milk. The elaborate registration continues at the filling machine and in the production process where you look at product types, quantities as well as fat and protein percentages. You can see which SAP product numbers are being produced and which fruits are included, i.e. everything involved in the interaction between the milk transport unit and the filling system.

Cooperation makes stronger

ÅF (formerly Benima) have designed the systems and applications at Arla Brabrand. When the ÅF came to Arla, they started looking at data collection and database reporting.

“Already at that time, ÅF was way ahead. They were visionary and not afraid to use new technology which was a great inspiration to us,” says Ali Ergün, SATT Controller at Arla Brabrand.

He continues: *“That and their comprehensive knowledge and willingness to get involved in something new were the main reasons why we took them on. I think that it is characteristic of all the people I have worked with in the ÅF Group. They do their homework and have respect for the product they deliver. They don’t just turn up and implement something. It needs to fit in with the dairy leaving no loose ends. The trust between us is the reason why they remain. We have tried others, but when they had delivered the package and the contract was fulfilled to the letter, there were still loose ends. That is not the case with ÅF. Six years ago - before ÅF - we only took the safe road. We almost developed our own production server. Then ÅF presented new proposals and ideas.”*

An example of the innovation that ÅF has contributed with is the integration with SattLine that Arla Brabrand

uses as HMI. When ÅF started, Arla used SattLine and they still do. It is a closed system and at the time (1995-96) nobody had considered that you needed to collect data from the system and that it should be integrated with a MES-system and perhaps with an ERP-system at a later stage. ÅF introduced OPC to Arla and retrieved data from the system. In 2001-2002, it was an interesting line of thought which has now been realised at Arla Brabrand.

Lars Østrup, Area Manager at ÅF, says: *“We have worked together for six years. We started as a small company and now we have grown. We have developed considerably together with Arla Brabrand. We have learnt a lot about dairy operations, we have exchanged ideas and experiences and it has been very interesting for us. When new ideas turn up, we (Arla and ÅF) both consider the benefits as everything we do should ultimately result in a financial benefit for the dairy. We should not implement technology just because it is exciting. Since then our cooperation has evolved considerably as Arla IT has chosen ArchestrA and the Wonderware Application Server as its platform. We need to be at the forefront and follow the development. Things are moving very fast.”*

ÅF is now a Wonderware ArchestrA-certified systems integrator, the highest degree of certification. *“Our cooperation with Arla has moved us in that direction, but we have also seen that Wonderware has become a strong player”,* says Lars Østrup. *“When we were introduced to Wonderware, we understood that we had to learn this and, therefore, we attended courses. But a lot is down to the customer and not us as systems integrators, and in the cooperation with Arla Brabrand it drives us to continuously learn something new.”*

Tough requirements

For Arla the aim of the project has been improved traceability. Wonderware’s software has helped Arla comply with the regulatory requirements that apply to a food producer. Arla Brabrand works according to the ISO9002-standard. When the project started, the objective was only to document that the organic milk was treated correctly. Arla went from screen prints to a



Separator for the production of curd

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Skimming room at Arla Brabrand

system that could document proper behaviour. That was the start of the request for traceability at the dairy gathered in one database. Now, the database is also running on the newly installed Wonderware Application Server.

The decision to use Wonderware was based on the good reports produced by the Wonderware systems.

There is an EU requirement regarding traceability. Arla Brabrand could have been able to solve this without a production server, but customer requirements are increasing and with the Wonderware Application Server Brabrand now has quick access to production information.

Ali Ergün explains: *“Customers who see the way we register the arrival of the raw material and how we follow it all the way to the carton, can relate to the process and they are very impressed. When it comes right down to it, it is a good selling point.”*

He continues: *“As we are about to receive our BRC-certificate (British Retail Consortium), Bureau Veritas came to look at our traceability and documentation of the production process. One of the auditors did not understand why we had not invited more Arla people so that they could see the degree of traceability. They were very impressed with the quick and easy process.”*

BRC-certification means that Brabrand complies with the demands that a number of large and international supermarket chains place on Arla as supplier. A BRC-certificate is also the consumers' guarantee that the products that they buy fulfil the food safety requirements.

Since the project started, new elements have emerged. At the beginning, Arla did not use SAP. When SAP was implemented at the dairy, they started discussing whether the Wonderware solution could be integrated with SAP as many hours were spent on manual entry of data.

This problem has been addressed in a project called ENIGMA where SAP sends orders to the filling machine including information on labelling, bar codes, cups and packaging. The ENIGMA project is managed by Arne Svendsen, Arla Foods, Corporate IT Manager. When an order is chosen at the filling machine from SAP, it is retrieved from the system through the production server and transferred to the filling machine which has the equipment to verify that it is the correct bar code and that the printer is set up correctly. This requirement

emerged concurrently with the design of the production server. The requirements originate from the end users, primarily in England, and involve possible penalties.

Data collection at Arla Brabrand is based on the need to be able to document the production process. You have to be able to go back and look at bad batches or really good batches – the so-called *‘golden batches’*. You learn from the historic data if it is analysed correctly. There are 150 units in the production – e.g. a vat). Documentation is made for each unit where milk or anything else passes through and data is passed on to the next unit. Every time milk or yoghurt is tapped, data regarding consumption and production is logged.

The finance department produces a number of reports to check inventory status. They can make a random check of how much milk is in the various vats and enter the data in SAP so that the right inventory figures are always available. Production is the most frequent user of the collected data. They can check the acidification time for a specific period.

Arla Brabrand also conducts waste water measurements, i.e. COD (Chemical Oxygen Demand). If COD is suddenly very high, they immediately check the production server to see whether they can trace the fault there. Most often it is a machine fault so that it can be reported to the office that a valve may be leaking or a filling machine is malfunctioning. Waste is acceptable as long as you can explain the reason for the problem and how to solve it. Now the process is automatically registered which implies that this is a very strong tool.

Improved efficiency

Arla Brabrand has worked with OEE (Overall Equipment Effectiveness) for 1½ to 2 years and experienced a 5% increase in line activity since they started looking at the process.

They concentrate on each filling machine as it is not only a question of making them start and stop.



Production line at Arla Brabrand

There are many other parameters indicating why a machine is not running. Now, they do not just get the OEE-figure indicating how well or how badly the equipment is functioning, but also the reason for the problem. Then they can correct any faults and note progress already the following week. The system creates a lot of focus on the workshop.

Once a week the entire management group looks at the pattern of the machines and any faults that may have occurred, and an employee from the workshop explains what actions have been taken. When people need information, they can now find it quickly.

At Arla they compare KPIs (key performance indicators) at central level which have been collected at all the dairies. Some elements are compared across the dairies, but many of the dairies have different types of production and can only be compared with those running the same products. A Nordic OEE-group compares the line efficiency of the machines across country borders. Here, benchmarking can be made if the machines are the same. When a customer makes an inquiry, they check where it is most cost-effective to produce what the customer wants. Consequently, the dairies have to prove their profitability to get the orders.

Wonderware Enterprise Integration

Wonderware Enterprise Integration is in the starting phase at Brabrand and constitutes a unit which can transfer data to and from SAP. The solution is meant for the packing machine. Its most important quality right now is to give the customers a good impression of Arla Brabrand as a dairy that makes no mistakes on date stamping or bar codes. A correct bar code is of crucial importance in the retail trade – and Arla Brabrand is now able to make sure that it is always correct.

Wonderware's solutions save money

At Arla Brabrand the Wonderware solutions have resulted in a 5% improvement of line efficiency on the machines on which they are implemented. They have been able to reduce overtime work, i.e. they pay for less working hours. Now they can handle production within normal working hours.



The advantages of Wonderware solutions

“Sparring with Wonderware has taught us a lot”, says Lars Østrup. “We have for example improved our know-how regarding ERP-integration. ÅF has learnt a lot because Arla chose Wonderware centrally. The choice of product is very end user-oriented. And the more we know about the product the more chance we have of implementing these solutions at other customers who choose Wonderware.

We focus a lot on companies such as Wonderware that go to the end-user to profile the product. We seldom get that opportunity ourselves. We also consider Wonderware’s willingness to cooperate and show commitment as very positive”, he continues.

At Arla Brabrand Ali Ergü’s comments: *“The money we spend belong to the members so the total solution that a pharmaceutical company might choose is not the one we need. We should choose the solution required to run a profitable enterprise. We do not need a solution that is too comprehensive including a lot of things that we have no use for. Wonderware suits us fine because we get the opportunity to participate in deciding what the solution should include. In this way we get the very best product.”*

He continues: *“The largest future challenges will be the SAP-integration as we have only made 5% of the integration to the filling machine and the rest of the dairy is still pending. This challenge will remain for the next couple of years. For the actual dairy it is more important than ever to run a profitable business as the Eastern countries have a workforce that is much cheaper than ours. We have to think in terms of the man hours we use and become as efficient as possible to be able to compete”, concludes Ali Ergün.*

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