

System 800xA Structured data logger – the key to growth for Danish Crown



With a share of close to 90% of the market for pig slaughtering in Denmark, Danish Crown looks to new technologies to further improve its bottom line. The cooperatively owned slaughterhouse recently inaugurated new facilities where plans are to slaughter around 86,000 pigs every week of the year, making it one of the largest slaughterhouses in Europe.

Apart from sheer size and automation of the production, tracking production and ability to trace products is the single most important feature to secure a dominant place in the increasingly competitive world market for the Danish slaughterhouse.

Production planning, follow-up, quality assurance, documentation and traceability all form an integral part of the so-called factory database, developed and implemented by a project team with representatives from ABB Denmark and Danish Crown, based on ABB's System 800xA platform.

The customer's viewpoint

Factory Manager Per Laursen: Among several competitors we chose to go with ABB because they were the only ones to offer us a system, which was 100% configurable to meet the demands and requirements of our project.

We were looking for a system which could help us handle the enormous amount of data generated in the slaughterhouse and which could help us improve traceability, flexibility, raw materials usage, and other key competitive and financial factors.

What ABB did was to offer us a solution based on a standard traceability system, where the controlling functionalities have been adapted to meet our requirements.

In our opinion ABB had a very professional approach. Throughout the development process of this very complex project they have worked with us in a competent manner, solving problems as they arose and changing the project direction to suit the changing needs as the project progressed.

When one of Europe's largest suppliers of pork decides to build an entirely new slaughterhouse in order to consolidate and expand its position on the world market it is not only a question of making key decisions with impact on the future of the company. It is also an opportunity to explore new ways and implement solutions that may affect the sector as a whole.

– Apart from being a highly competitive sector, where customers, including the largest super- and hypermarket chains in Europe constantly demand improved quality and lower prices, the players on the international pork market are also under great pressure from both national and EU authorities to implement systems that improve the traceability of their production, explains Factory Manager Per Laursen.



All photos and illustrations from Danish Crown.

The slaughterhouse Danish Crown in Horsens is one of the largest slaughterhouses in Europe. Danish Crown in Horsens has 1,450 employees and do 86,000 slaughtering a week.

The opportunity to create a standard

“One of the first things we had to decide on was the IT structure”, explains Project Manager Arne Boye-Møller. “Our primary focus was to find a solution that would suit the needs of the new slaughterhouse with its novel structure and work processes, which are completely different from what we were used to. At the same time we had to maintain a broader focus to ensure that we did not create an ‘island’ within our company. In other words, the platform had to fit our new installations, but at the same time be applicable elsewhere in the organisation. It had to be able to communicate seamlessly across the entire company. Finally it was a firm requirement that our IT system should be open so that we would not become dependent on one or a few suppliers.”

Traceability a requirement and an opportunity

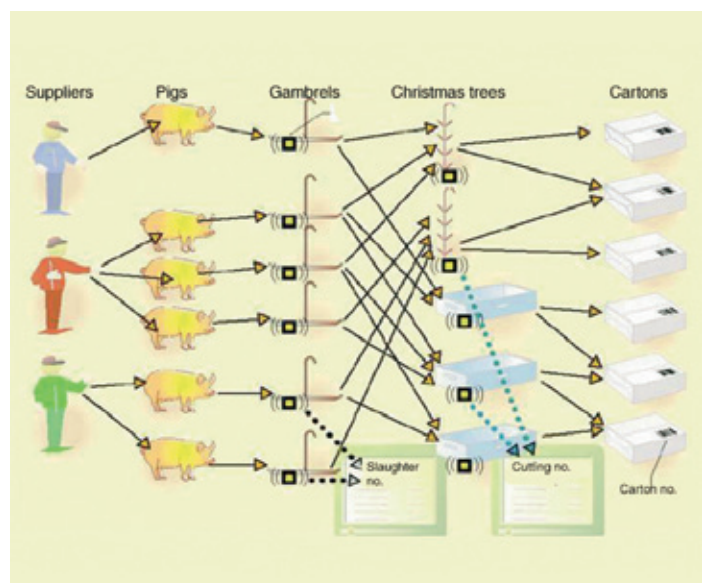
An important issue for Danish Crown was the ability to live up to the demands for traceability in their production – a requirement on all food producers including slaughterhouses from EU authorities.

“The traceability issue, however, is not only a question of requirements. It is clearly an opportunity and a competitive parameter as well. We can use it to distinguish ourselves as a preferred supplier from others who cannot deliver the same level of traceability. At the same time it is a great way to differentiate our production so that we can single out the products of exceptionally high quality, which we can then sell at a premium price to the benefit of both Danish Crown and the breeder who in turn will get a higher price for the higher quality”, explains Project Manager Arne Boye-Møller.

“However, due to the characteristics of our production, the implementation of traceability from each individual cut and up the chain to the breeder who supplied the pig, is quite complicated and requires the generation of an enormous amount of data. Add to this the practical issue of marking all the meat cuttings in order to allow a unique identification of the product all the way from breeder to supermarket.

The system generates more than 1 million data records every single working day. The amount of data together with the complexity of the processes currently makes it virtually impossible to secure traceability all the way to each individual pig. Therefore Danish Crown has opted for a solution which traces in batches of 20 pigs from the same breeder, and as such lives up to the requirements from the authorities, but without sacrificing the possibility in the future to increase the degree of detail if at some point this becomes a requirement and/or whenever it becomes economically feasible.”

“The circumstance that we are working with processes of separation and not of assembling, as the majority means that we generate an enormous amount of data. The challenge is to manage this to ensure that we fulfill the demands of traceability to be able to track the goods forwards and backwards in the production and if necessary back to the pig grower”, Arne Boje-Møller says.



Database designed by ABB

Based on the ABB System 800xA platform, ABB designed and implemented the so-called Factory Data Base (FDB) in collaboration with Danish Crown. In the database the slaughterhouse collects and saves all the data which give them the traceability. The database is the only place, where they can establish a unique relationship between the production planning and what is actually being produced.

It was a prerequisite that the factory database should be able to communicate and link to all the existing administrative systems, not least SAP which Danish Crown uses as their global planning and financial management system.

Technology Manager Per Larsen from ABB's Process Automation Division in Denmark explains: "We have based our solution on our System 800xA which with the Structured Data Logger" makes it easy to establish a link between all the different processing equipment and the global management systems. All information is stored in and distributed by the FDB. It is also possible to perform detailed production planning directly in the factory database without the need to communicate with any of the global systems. This is important not only regarding flexibility, but more importantly allowing the slaughterhouse to continue its production according to plans and schedules even when communication links to the administrative systems may be broken."

MES system

As such the factory database is a standard MES system with the only difference that the database does not have any rights to automatically initiate or execute production.

"At a production plant like ours", says Arne Boye-Møller, "we have so many different specialized processes that it would be impossible for one supplier or one system to manage them all. Therefore, it was important for us that

the privileges to initiate and execute production be vested in the process layer and not in the administrative systems. In other words, the FDB does not make a knife or a saw move anywhere in the plant, but it distributes the basis on which to produce and it reports on the actual production. In this way all decisions that affect the production are taken by those closest to the production itself, but always based on information from the database regarding available raw materials combined with the orders coming in from the planning department."

Exploring new roads in partnership with ABB

Admittedly it was somewhat risky on the part of Danish Crown to embark on a project implying the application of a design and an architecture never before implemented, and moreover, doing so in what was to become the most advanced and one of the biggest slaughterhouse in Europe.

"However, the whole process from the initial contact to ABB till the final implementation has been very satisfactory", says Factory Manager Per Laursen. "We have experienced an incredible willingness on the part of the ABB-team to participate and provide sparring whenever things got complicated or when we came up with new ideas and requirements that would impact the complete setup – something which happened quite frequently during the complicated development process."

"ABB has shown a very professional attitude, always willing to listen to us and to discuss any issues that arose. Furthermore, they have handled the whole process, including the dialogue with other suppliers, in a very competent manner to ensure that every stone was turned in the search for the optimal solution. Also their way of managing quality assurance, documentation, project phases and the timely delivery is worth praising, since this is a crucial prerequisite in a complicated project like this one, but something that cannot always be taken for granted."

The slaughterhouse is all over equipped with the most modern technology, here the vision system controlled meatsaw (left). All data related to traceability can be searched for and viewed at any terminal (right).



System 800xA

System 800xA is the backbone of ABB's Production Management Solutions. System 800x acts as a centralized handling of all data, and controls the dispatching of all information between the connected individual systems. With its flexible architecture based on industry standard interfaces it extends the normal interpretation of an automation system.

Factory Database

More than 560,000 messages dispatched between connected individual systems, representing more than 1 mill. records per day in the database, makes the data engine in the solution of Danish Crown. The amount of data distributed and stored every day is equivalent to 27 hours of music.

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Structured Data Logger

Structured Data Logger makes it easy to collect data from any part of the production process. By allowing the user to define data sets and triggers for the transaction based storage directly in the controller code, the user has the powerful means to collect data for a Factory Data Base. Each data set is tagged with information like Process equipment and lot numbers.

The Structured Data Logger is an optional feature available in the 800xA system.

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