



OPTIMISING TANK TERMINAL OPERATIONS: FROM INSIGHT TO DIGITALISATION

These days, it is hard to find an article about industry and technology which doesn't mention Industry 4.0, big data or the Industrial Internet of Things (IIoT). If you believe the hype, everything will be connected, everything will be automated and all operations will run super efficiently. Cars will drive themselves and drones, not field operators, will carry out hazardous inspections.

The purpose of automation has always been to optimise efficiency, quality and safety. The promise of Industry 4.0, big data and IIoT seems to be that even automation itself will be automated through artificial intelligence, machine learning, smart devices and self-healing mesh networks.

In reality however, there has been much less implementation than the hype would have you believe.

The problem is that most people feel overwhelmed by the barrage of new technologies coming at them. They are bombarded with technical and functional specs of an ever-increasing set of options and solutions for every possible challenge imaginable. The result is that people fail to see the actual benefits or added value that these technologies could offer to their organization. They are presented with technological solutions looking for a problem, rather than with solutions to the problems or challenges they actually face in day-to-day operations.

True opportunities for optimisation remain hidden, because they are clouded by questions such as 'where do we get started?', 'which technology should we use?' or 'how can we integrate this with our legacy systems'.

In order to reveal the true potential of these new technological solutions, a thorough understanding of the business and the challenges the organisation faces is needed. This, too, is not an easy task. On the one hand, vendors typically know their own products very well, yet they often lack sufficient understanding of their customers' business and challenges. On the other hand, people within the organisation are often so engrossed in habits and

day-to-day operations that they have become unable to see the opportunities to do things differently.

This is why organisations can benefit greatly from hiring consultants, who are driven by providing expertise and advice, rather than by selling products and solutions.

START WITH UNDERSTANDING

The role of a consultant is to gain insight into the customer's operational challenges and to identify opportunities for optimisation. For this, the consultant brings in-depth expertise in certain fields of knowledge to the table. On the one hand, the consultant captures the customer's procedures, knowledge and experience and on the other, they help the customer think outside the boundaries of the 'normal way of working'. The consultant will challenge the status quo and the established way of doing things. They will identify the discrepancies between the official procedures and the way people actually work.

Consultants will apply their expertise to various layers in the organisation (from corporate management to maintenance technicians) and to different parts of the decision-making process (from long-term strategic master planning to day-to-day field operations).

In sparring with the customer, the consultant identifies those elements that really impact the business, and where opportunities for optimisation can be found. They assist management in identifying appropriate KPIs and provide advice regarding the IT and automation systems needed to monitor and control the KPIs.

OPTIMISING TANK TERMINALS

Looking at the tank terminal industry, everything starts with the primary activities of product transfers and product storage. For this, the terminal needs infrastructure such as tanks, pipelines and pumps, which require significant capital expenditures. It also needs people to operate the terminal and it needs energy to power the pumps, the tracing and so on.

Maintenance activities are needed to keep the terminal safe and operational. It goes without saying that the terminal needs to operate according to environmental, health and safety regulations if it wants to stay in business. Furthermore, it must provide excellent service at competitive prices if it wants to attract and retain its customers.

A consultant focusing on operational excellence will look at which activities add value and which don't (or which even subtract value). One factor, which can greatly affect both revenue and costs, is throughput time, i.e. the time a transport unit spends at the terminal for an order to be fulfilled.

In this industry, where quality of service is often considered the main differentiating factor, a terminal that offers quick turn-around times and safe operations will do better than a cheaper, yet unreliable terminal where demurrage charges abound. Lower throughput times lead to satisfied customers and the ability to do more business with the available assets whereas high throughput times lead to dissatisfied customers, demurrage charges and an opportunity cost for orders that could not be processed because of the unavailability of the asset.

The operational excellence consultant will analyse historical throughput times and their variation by looking at causes for delays but also best practices. In some cases, they will have to conclude that not enough information is available for a proper analysis, and the first order of business is to start monitoring those activities.

An operational excellence analysis may also look at the operational processes, including how an operator or technician perform their tasks. The result may show ways to optimise the process and in some cases the opportunity for optimisation will require a new way of working (i.e. changing the process flow) or an investment in infrastructure or IT equipment.

If, for instance, there is no data on the activities of external surveyors, and these surveyors seem to have an important impact on

the throughput time of orders, the consultant might suggest investing in an identification and time registration system for the surveyors. Data from such a system could then be used to minimise delays caused by the surveyors from demurrage charge calculations and to increase the performance level of said surveyors.

Accordingly, the consultant may suggest implementing a 5S programme to reduce the time spent by operators looking for missing tools and equipment. Other suggestions may include implementing workflow management to avoid operational mistakes or installing HMI displays at loading points to reduce the time spent by operators driving back and forth to the office to pick up the next orders.

A consultant specialised in maintenance and reliability will look for inefficient maintenance procedures and may perform a criticality analysis to optimise spare parts stock management. They may offer training to technicians on how to better perform certain maintenance tasks.

The consultant can help evaluate the benefits of implementing an asset management application, select a fitting asset management application and assist in designing the optimal asset structure in the application. The consultant can help increase asset reliability and availability by adjusting the maintenance focus from corrective maintenance to predictive maintenance.

This is one of the areas for which the latest IIoT developments (such as cheap, wireless condition monitoring of electric motors for example) offer great potential for improvement. By finding the right issues to focus on, and selecting the right tools to monitor and control these issues, the maintenance consultant can provide great value by improving asset availability, which in turn helps improve customer service and client satisfaction.

ENERGY COSTS

A final example is energy. Since energy costs continue to rise, and given the sustainability targets that many organisations are trying to achieve, an energy management consultant may also provide significant value to a tank terminal. Energy management may start with an energy audit, which aims to understand and reduce the energy consumption on-site, but it goes well beyond that.

A specialised energy management consultant can help to determine the proper EnPIs (energy performance indicators) for the organisation as well as the energy monitoring concept and the required monitoring and reporting application. In addition to helping lower overall consumption, the consultant also assists in optimising the energy consumption profile and its impact on the energy contract and invoice.

Depending on the needs of the client, the consultant may even offer advice regarding energy purchasing strategies, implementation of peak shaving or demand response.

The consultant makes the difference by identifying the functional needs of the system and selecting the appropriate solution. While some organisations can get by perfectly with a simple, quarterly spreadsheet-based report, others may benefit from a SCADA-integrated energy monitoring platform with automated peak-shaving or demand response functionality.

CONCLUSION

The tank terminal industry still offers plenty of opportunity for automation and digitalisation, but it is important to remember that they are not goals in themselves, but rather a means to an end. By combining consulting services with the implementation of new technologies, companies can make smart choices to ensure that the end is full of opportunity.

FOR MORE INFORMATION

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