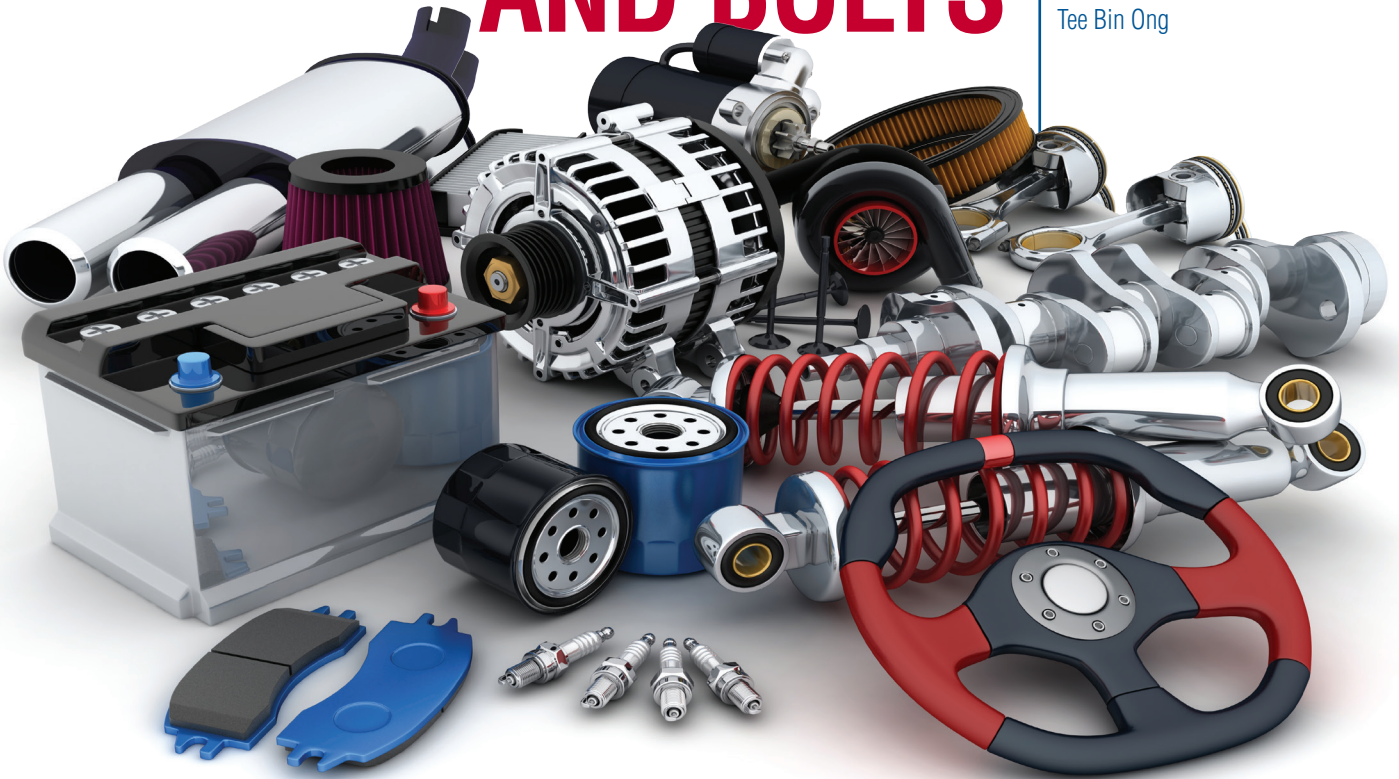


THE CHALLENGING BUSINESS OF NUTS AND BOLTS

Swiss supplier Bossard replaced kanban with an early version of the internet of things

By Bublu Thakur-Weigold, Stephan Wagner and Tee Bin Ong



The business of nuts and bolts and screws and fasteners is full of contradictions. In the eyes of an inexperienced buyer, the category is an ideal opportunity for savings to exploit commodity markets around the world. A screw is a screw is a screw: cheap, plentiful, standard ... trivial.

But are they really insignificant? One only has to imagine what happens when the box, bought for a few dollars, empties: Alarms ring as the production line goes down. The scramble to replenish begins while the company tries to protect its profit. As the picture on the next page makes clear, without fasteners, even the shiniest sports car looks more like a scrap heap.

Back in 1999, Bossard Holding AG was fighting a battle against commoditization. The company's products were considered easily interchangeable and faced fierce price competition from suppliers in China. At the time, it seemed inevitable that all European manufacturing would move to low-cost countries, and e-business was the trend to watch.

However, from the small alpine town of Zug, Switzerland,

Bossard's team saw the significance and opportunity in delivering a lowly screw to the factories of the world. The technology they then developed became the SmartBin, electronic scales that transmit material requirements from the customer in real time back to a proprietary IT system. With it, a traditional fastener company from the German-speaking Mittelstand had entered the business of automatic replenishment and business continuity.

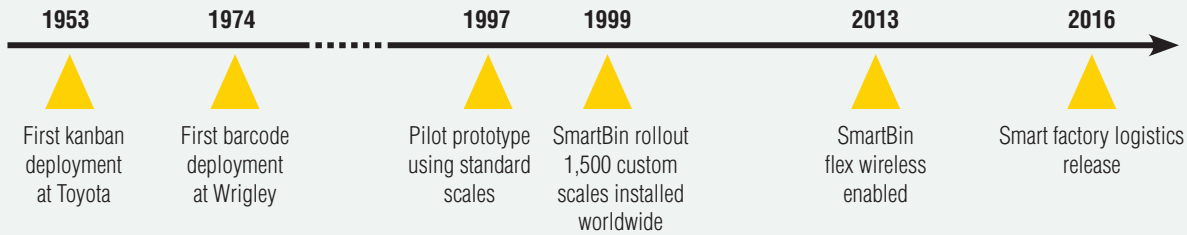
Today, that insight, together with carefully managed process innovation, has paid off in operating margins almost double that of the industry – and this in one of the most expensive business locations in the world. This story is about how the small company, a so-called “hidden champion,” transformed itself from a standard c-parts supplier into a customer logistics service provider. Enabled by SmartBin technology, Bossard's team essentially created an “internet of things” more than a decade before the trendy idea even had a name.

“You have to understand how Bossard is driven,” said Urs Güttinger, a pioneer of Bossard SmartBin. “The screw itself is

FIGURE 1

The SmartBin timeline

Parts replenishment has evolved from kanban cards to wireless systems that go international.



unsexy. We want to help our customer to be successful. And to be successful in what they do, they need screws.”

The industrial fastener as a utility

In developed countries, few homes ever actually place an order for drinking water. It flows freely as soon as we turn on the tap. The same principle applies to electricity and heating.

Utilities like these are basic necessities of life. We assume them to just be there, paid for automatically based on consumption. Because they make up the infrastructure of daily life, that unquestioned supply must never be disrupted. With a leap of the imagination, the Bossard team envisioned that its fasteners – nuts, bolts, screws and fasteners whose weight can run into tons – would become the utility of the industrial shop floor, unglamorous but just as indispensable as electricity or water. It would be Bossard’s job as supplier to make sure that the bins were always full and ready to bolt into whatever car, television, MRI device or suspension bridge the company’s customer was assembling.

At the time, the two-bin kanban system, which was the most common solution between supplier and shop floor, was reaching its limits, proving to be practicable only in small regions like Japan, where it had been invented. Figure 1 details a timeline of the evolution from kanban to the wireless-enabled SmartBin system.

In countries like France, however, Bossard discovered that the company couldn’t replenish in time. Instead of traversing short distances, Bossard’s goods had to move from a warehouse in Alsace thousands of kilometers to the Atlantic coast.

If demand was to spike unexpectedly above the lead-time of delivery, stock-outs inevitably would occur. This would in turn trigger express deliveries and over-ordering by the customer, eroding trust on both sides over time. As service levels become volatile, total cost in the end-to-end system climbs for both customer and supplier.

The original idea for an intelligent weighing shelf did not originate from Bossard’s sales department, which might naturally want to make the reordering process for the installed base easier.

Instead, it was proposed by an IT engineer who realized that companies were using costly labor to count cheap parts or



manually read bar codes. Dramatically reducing those transactional costs would involve replacing the regular storage boxes with scales that gauged stock levels by their weight. An electronic transmission of reduction in weight (i.e., consumption rates) would trigger a replenishment order in time for Bossard to deliver and refill the box.

Handheld scanners could – theoretically – be eliminated entirely.

At second glance, this crazy idea combined the best of lean thinking (eliminating the non-value-added manual work of scanning and order entry) with the logic of supply chain risk management (reducing stock-outs of business-critical parts). It could stabilize inventory management at the customer by eliminating the bullwhip trigger of manual reordering. Replenishment quantities would be computed based on real consumption history and no longer set by the (often irrational) discretion of the clerk or factory manager eager to pre-position stock or keep things extremely “lean.”

The Monday morning crisis meetings about missing screws would become history.

Change is never easy

As any manager will confirm, the most brilliant idea is only as good as its implementation, and innovations tend to be disruptive, especially in organizations that have grown successful with the old way of doing things.

A traditional, family-owned fastener company that had built core competencies around mechanical products was consider-



Customer orientation meant adapting to some shop floor managers who had their own specifications about height, color and location of the bins.

ing the introduction of an automated supply replenishment system based on weight sensors and computers. The birth of SmartBin at a company that was expert at fulfilling orders but not at computing optimal order quantities would not be easy. People would have to learn new skills and tools. Internal processes would have to adapt accordingly. The company would have to invest up front in expensive new technology and in assets whose value was in no way proven.

The company's installed base of customers, who knew Bossard as a c-part supplier, would have to open their shop floor to a screw-maker armed with wired scales, eager to take over reordering for them. The leadership team members who believed in this future scenario – enough to invest money in it – had their work cut out for them.

Piloting – learning – tuning

The original scales, bought ready-made, cost more than 900 Swiss francs (about \$900 in today's money) and turned out to be far too sensitive to work in a stable way. It became clear that the priority was not to create a cheap new technology to weigh metal parts but to perfect a vendor-managed inventory (VMI) process that would allow both sides, customer and supplier, to make a decent margin.

The hardware of the scale would have to fit the software of the replenishment program and then be fine-tuned until it was acceptable to both customer users and Bossard. The key, as Güttinger said, was making sure the process worked.

“I was here as a hardware guy,” Güttinger recalled. “But I soon learned it was only a small part, and it was all about the process.”

A number of issues of varying complexity would have to

be worked out. Early prototypes experimented with financing models, not all of which were profitable. One of the first markets to adopt was Malaysia, which had the sales volume and geographic dispersion to justify a SmartBin approach. The first customer wanted to know how accurate the scale was and worried about internet connectivity, as modems were being used to transmit data.

Some customers deliberately tampered with the system to test the response of their supplier. They removed a bin and waited. When the Bossard technician arrived in person with a box full of screws to the false alarm, the customer explained that it was “just to see” whether the promised service level would be kept.

Scaling up

The patient investments in presence and dialogue began to pay off for customers who began to measure at least 30 percent reductions in transactional costs, combined with lower inventory and fewer stock-outs.

Back in Switzerland, compared to the days when contact was maintained through intermittent orders, the distance from the shop floors of their customers was shrinking because now the company knew much more precisely what was happening at its customers' locations. Non-value-adding activity had been eliminated in the factory, while new job categories were created at headquarters in Switzerland. One example is the customer logistics specialist who masters software, process flow, replenishment logic, customer facing and service. This proved to be a role that more closely resembled consulting than technical support.

Today, there are more than 200,000 scales installed and

operating at more than 800 customer locations worldwide, including the new Tesla factory in the United States. On average, Bossard's trucks serve a two-week route cycle, but high-volume operations like ABB have daily deliveries.

Bossard's customers not only trust their supplier to provide the right fastener to the right location at the right time, ensuring business continuity and protecting profit, they also request analyses of their operations.

The system recognizes consumption patterns and manufacturing performance to the extent that SmartBin's data warehouse sometimes provides more insight than proprietary ERP systems. And if imitation is proof of concept, traditional scale-makers are offering me-too products without the intelligence and process management.

Enabling smart manufacturing

Not content to rest on their laurels and aware that markets will continue to demand more, the Bossard team members are working on the next generation of shop floor logistics.

The Smart Factory Logistics system that the team is prototyping this year builds on the intelligence and supply chain integration expertise the company has accumulated from thousands of SmartBin installations. Because mass customization and reconfiguring of the shop floor is becoming more common in industry, Bossard today offers a shop floor management system that can add or change items in real time using interactive graphic tools.

One of the company's large pharmaceutical clients used to have 8,500 work location bins that were collected annually to check their contents because manual Excel records had become out of date and impossible to handle. In systems of such scale and complexity, it is easy to forget to delete an item once it is moved on the line. Should a worker forget to enter a single digit in an item or send the wrong list, the resulting errors will decrease manufacturing flexibility and changeovers.

The new generation of Bossard logistics systems includes last mile management mobile apps to replace the old-fashioned water spider workflow management, which manually picks items from the shelves, walks around the shop floor and drops them off at refill containers. Instead of having to walk back to the shelf to scan the part number, the worker needs only be in the vicinity of the bin with a Bossard SMARTLABEL.



The nerve center of Smart Factory Logistics is the ARIMS user dashboard, designed to provide users with intelligent analytics and ERP integration-readiness.

Blood and sophistication

Sophisticated software and supply chain solutions are at the center of a move to improve the blood supply in one European nation.

National Health Service Blood & Transplant (NHSBT), a joint England and Wales health authority, is using software from ToolsGroup to forecast blood demand, optimize blood stocks nationally and replenish hospital blood banks automatically, reported Wisdom Digital Media's Broadway World news site. The goal, as with most supply chain solutions, is to minimize costs from overstocking, expiring dates and excessive transport costs.

In addition, eight hospitals are testing a vendor-managed replenishment solution to improve availability and restock blood banks automatically. The solution integrates directly with hospital refrigerators and laboratory systems and will roll out to more hospitals in the next few years, the news site reported.

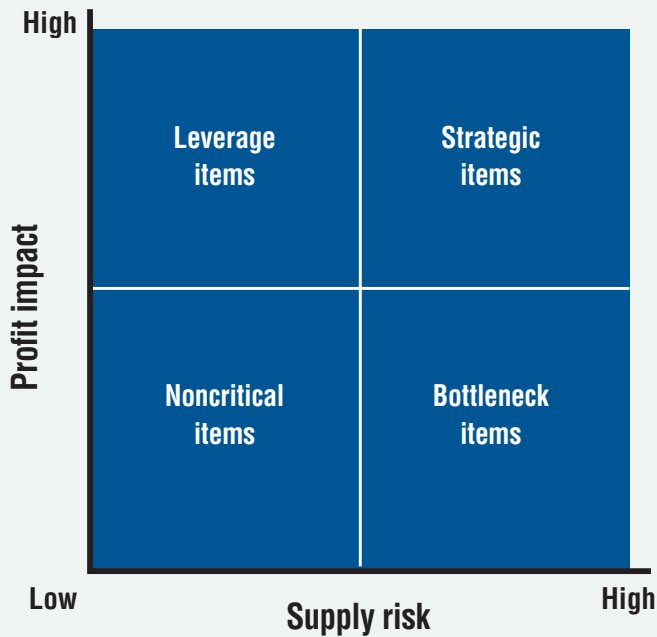
About 6,500 donations of whole blood and platelets are made every day across England. NHSBT's five manufacturing sites and 15 stock holding units process and deliver more than 5,000 units of red blood cells to hospitals daily.



FIGURE 2

Divide and manage

The Kraljic matrix of supply management categorizes parts according to their profit impact and supply risk. Each quadrant is managed differently according to its specificity. New technology and processes are more effective than such traditional commodity management.



The near-field communication (NFC) technology enables real-time updating of the system status without any deliberate (or error-prone) action on her part. She then is guided through the entire transactional flow with intelligent graphics. This shop-floor worker essentially holds a detailed inventory map in the palm of her hand, increasing her agility, precision and, not least, productivity.

Business transformation and brand building

Looking back, the expansion of Bossard's core competency into integrated supply chain management has proven to be a strategy that successfully moved the corporation's position up the value chain. This has had material impact on talent development and, not least, on the financial results of the company.

Imagining the value from their customer's point of view and capitalizing on the insight was only the first step. The challenges that the sales and executive leadership team at Bossard now face involve the nature of customer relationships and, ultimately, defining what the company's brand really stands for.

Will the procurement teams at their customers accept a supplier whose brand is trusted for custom-made, high-tech fasteners as a supply chain partner to whom they delegate the inventory management of their entire shop floor? Will Smart-Bin and its successors have to compete with the goliaths of ERP software? Time will tell.

David Dean, Bossard's CEO, noted that the company invented the internet of things before it became fashionable. At the same time, he regrets how little logistics services like theirs are appreciated by traditional commodity managers who are trained to manage a Kraljic matrix of parts (see Figure 2).

The short-sighted tactical approach is to squeeze suppliers and cash in on one-off spend reductions, often at considerable hidden expense to the end-to-end system. Visionary companies like Tesla, however, can work with suppliers who can provide transparency, analytics, business continuity and, of course, the nuts and bolts of their vehicles. Such systems point to a different scenario for the future of the manufacturing industry. ❖

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