|  |  |  |
| --- | --- | --- |
|  |  | H:\shared\Partners-External\Suppliers\China-Europe International Business School (CEIBS)\Logos and Templates\CEIBS-New logo.jpg |

9B17M149

Bossard AG: Enabling Industry 4.0 logistics, worldwide

Klaus Meyer and Alexandra Han wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

*This publication may not be transmitted, photocopied, digitized, or otherwise reproduced in any form or by any means without the permission of the copyright holder. Reproduction of this material is not covered under authorization by any reproduction rights organization. To order copies or request permission to reproduce materials, contact Ivey Publishing, Ivey Business School, Western University, London, Ontario, Canada, N6G 0N1; (t) 519.661.3208; (e)* [*cases@ivey.ca*](mailto:cases@ivey.ca)*;* [*www.iveycases.com*](http://www.iveycases.com)*.*

Copyright © 2017, Richard Ivey School of Business Foundation Version: 2017-09-29

Bossard AG (Bossard) based in Zug, Switzerland, was a leading supply chain service provider helping manufacturing businesses take advantage of new opportunities arising in the digital economy, a trend popularly known as “Industry 4.0.” Bossard purchased large volumes of basic components—screws, nuts, and bolts—from a variety of suppliers, conducted extensive quality control, branded and repackaged the items for its customers, and delivered them just in time and on short notice to manufacturing sites worldwide. Bossard integrated the delivery of products with logistics solutions, advising customers on product selection, and participating in customers’ product development. Bossard’s blue “SmartBins” had become a common sight in factories across Europe, and increasingly also in North America and in Asia. Bossard enabled manufacturers to enhance the productivity of their operations through real time data collection and analytics.

In Switzerland, the high cost of manual labour had, for several decades, put pressure on manufacturers to reduce the use of low-skilled labour and enhance operational efficiency. Bossard’s logistics solutions were thus in high demand, first in Switzerland and later throughout Europe, North America, and some parts of Asia. However, the business model had to be adjusted to fit local client needs, especially in emerging economies. Specifically, Bossard was looking for more ways to participate in upgrading Chinese manufacturing.

From Family Store to Global Champion

Bossard was founded in 1831 as a hardware store. Since the 1950s, it had grown due to rising industrial demand for high quality screws, nuts, and bolts—also known as “fasteners”—in the manufacturing industry. From the 1970s onward, Bossard spread beyond Switzerland to serve clients across Europe and later in North America and in Asia, often following existing customers that established factories abroad. Turnover reached CHF 695 million in 2016, up from CHF 485 million in 2012, with solid profitability of EBITDA margins between 12 and 14 per cent in recent years.[[1]](#footnote-1) Bossard employed over 2,000 employees around the world (see Exhibits 1 and 2).

Since 1987, Bossard had been listed on the Swiss Stock Exchange, with a market capitalization of CHF 1.09 billion in December 2015. The Bossard family remained in control to the seventh generation through ownership of voting shares (B shares), whereas dividend bearing but non-voting shares (A shares) were traded on the stock exchange. The family holding company owned 56.1 per cent of voting rights and 27.9 per cent of the dividend bearing capital, thereby securing the continued family control of the company. David Dean had been running the company as a professional (non-family member) chief executive officer (CEO) since 2005; he reported to the supervisory board, chaired by Dr. Thomas Schmuckli, a family member whose primary occupation was managing director at Credit Suisse.

Bossard’s traditional core business was trading in screws, nuts, and bolts, which were basic consumable products (“C-parts”) for manufacturing. These C-parts were mostly standardized mass-produced items, but their quality could be critical for quality and reliability of downstream products. As described by Bossard:

Fasteners may not be everything, but almost nothing works without fasteners: electric razors, lawn mowers, tractors, trains, computers, and printers—all of the products that we take for granted in our everyday lives. [The products] work as well as their fasteners allow them to. Fasteners usually work in the background so that one hardly notices them. . . . The most expensive fastener is the one that’s missing. Only a steady flow of high-quality fasteners that never dries up guarantees efficient production and maintenance.

Moreover, the quality of fasteners was often critical for the overall safety and reliability of products. Bossard thus conducted extensive testing of the properties of its C-parts, including precise size, push and pull pressures, corrosion protection, surfaces, and coatings. The quality of the product portfolio along with its integrated logistics solutions were Bossard’s selling points.

Bossard initially grew organically but it made a few major acquisitions in the 2010s to strengthen its global footprint, through, notably, the acquisition of KVT-Fastening in Germany in 2013. By 2015, Bossard had become a leading international player, the biggest of its kind in Europe, operating in 27 countries worldwide. Its central warehouse in Zug stored 50,000 catalogue items with 380,000 stock-keeping units with a total weight of 8,000 tonnes. Bossard was operating 2,500 logistics systems for customers and sourcing from over 500 suppliers worldwide.

Bossard’s customers included the leaders of Swiss manufacturing, many household names from across Europe, and, increasingly, customers from North America and Asia. Key customers included Swiss industrial companies such as Stadler Rail (see Exhibit 3) and global leaders that were manufacturing at multiple sites around the world (see Exhibit 4). When electrical car pioneer Tesla, Inc. established its new production facility in California in 2011, the company was looking not only for the latest technology to put in the cars, but also for the latest technology for building cars. So, it turned to Bossard to optimize Tesla’s C-parts management. Bossard thus began running intra-factory logistics for Tesla, regularly refilling 1,500 bins in 91 locations across the plant. Adapting to its client’s corporate image, bins in the Tesla plant were red, rather than Bossard’s traditional light blue. To bring the pioneering spirit of Tesla to Bossard, a Tesla car with the Bossard logo was parked right by the entrance to Bossard’s warehouse in Zug.

Industrial Services in the Age of Industry 4.0

Manufacturing was facing a fourth industrial revolution—popularly known as Industry 4.0—as manufacturing converged with the digital economy, specifically with emerging big data collection systems and analytics. Similar ideas were discussed in the United States as the “Industrial Internet of Things” (IIoT) and in academic circles as “cyber-physical systems.” It was still primarily a vision for future manufacturing rather than a clearly defined set of techniques, but experts were discussing how to create profitable business models employing big data analytics. One popular idea was to replicate entire factories and production processes in digital space, optimize the system through simulations in cyberspace, and then implement insights from that analysis in the real world. A more hands-on approach was to identify bottlenecks, ask what real time data was needed to overcome this bottleneck, and develop appropriate sensors, wireless connections, and analytics to collect, transfer, and analyze this data. On that basis, real time data visualizations could be provided to decision-makers, or even used to create decision algorithms that would automatically decide what action should be taken.

Bossard aimed to be at the forefront of this impending revolution of manufacturing, not only by optimizing its own logistics, but also by becoming the preferred supplier for manufacturing firms that wanted to upgrade their operations to Industry 4.0. Specifically, Bossard innovated logistics systems by incorporating real time data analytics with algorithms to optimize C-parts flows and order processing. In this way, Bossard was helping industrial customers enhance their productivity, as expressed in Bossard’s corporate slogan, “Proven Productivity.”

Bossard offered three types of services: product solutions, application engineering, and factory logistics.

*Product Solutions*: Bossard evaluated customers’ products and production processes to provide the best fastening products for the situation. Specifically, Bossard could advise which specifications would best deliver the safety and reliability standards required by each customer’s products. In some cases, this advice extended to modifying a product to reduce the number of different C-parts, and thus, to reduce the complexity of the client’s operations. Such changes in operations could enhance clients’ productivity and improve the reliability of their final products. About half of Bossard’s product sales were in customized products.

*Application Engineering*: Bossard participated in some customers’ product innovation to develop solutions for next generation products. By applying Bossard’s expertise in technology and logistics, clients could bring their products to market faster. Customers would, for example, send work pieces to Bossard for tests of product properties with alternative fastening solutions. Being involved in the development stage of new products allowed Bossard to help customers choose an appropriate fastening solution that enhanced product properties and facilitated the logistics and assembly processes.

*Factory Logistics*: Bossard supplied products to customer warehouses, and directly to specific sites within clients’ factories where and when they were needed (see Exhibit 5). Its “Smart Factory Logistics” enabled intelligent interaction between production and supply chains in real time. Embedded sensors and Internet connectivity enabled signals to be sent from the point of use to the point of supply. Real time data enabled clients to reduce inventory and procurement costs along their entire value chain, enhancing predictability and enabling faster throughput. Thereby, Bossard enabled its clients to optimize operations concepts such as lean management, smart manufacturing, agile production, and mass customization.

Customized Solutions

Customers could choose from a range of different logistics systems with varying degrees of data-intensity and service quality (see Exhibit 6). In particular, orders for C-parts could be triggered in alternative ways, depending on the needs of the customer. Bossard’s full service logistics could even use Bossard’s own internal factory logistics to eliminate customers’ needs for their warehouses.

The most traditional service model was known as “Bossard 2Bin.” This system used two or more of Bossard’s light blue bins for each C-part, one bin arranged on a shelf behind the other. When the first bin was empty, the customer used the second bin and moved the emptied bin to an agreed location. Bossard collected empty bins at regular intervals, filled them, and returned each bin to its specific spot on the production line. This traditional model could be enhanced with the “Bossard Code,” a barcode with product information on each bin that could be read by a handheld device or with radio-frequency identification (RFID) smartcards inserted into an RFID reader. When the minimum stock level was reached, the information was sent to Bossard, who would then initiate the replenishment.

Bins could further be equipped with “SmartLabels” connected by wireless networks (Wi-Fi) to the client’s information technology (IT) systems or directly to Bossard. The SmartLabel would give shop-floor workers exact information about the content of the boxes, and provide signals when a new order was required. Staff on the shop floor could initiate a refill by pressing a button on the label. SmartLabels could be applied to any box at any storage site, using the existing infrastructure without the need for a costly conversion. Users could easily order replacements from the site where they were needed, thereby keeping the process under their control. The display showed an image of the product and product information together with the item number, order status, order quantity, and delivery date. The ready availability of this data reduced possibilities of confusion in the supply chain, and enhanced transparency of material flows.

The more sophisticated technology was an integrated logistics solution called “SmartBins.” These blue boxes had built-in scales that would weigh the content at any time and infer the quantity of items still in the box. SmartBins consisted of three major components: integrated weight sensors that met highest standards for precision, long-term stability, and robustness; a Wi-Fi connection with wireless sensor network technology; and a software package, ARIMS, that enabled remote monitoring of all bins. Data from SmartBins along the production line would automatically be shared with a central data centre where the information was aggregated and monitored. If customers wanted full integration of their logistics, an algorithm in the software could automatically trigger new orders based on benchmark values for stock; the predefined order quantity of new C-parts was shipped automatically or delivered by Bossard service staff. The client’s staff did not need to be involved. This eliminated waiting times and enabled smooth movement of C-parts, thus reducing the need for human intervention and enhancing the reliability of supply.

The data collected by Bossard’s devices was processed in its ARIMS software, which showed the information on a customer dashboard or mobile app for decision-makers, and, if customers wanted, used algorithms to trigger product orders. These solutions enabled optimization of interim storage, with full visibility and transparency for the customer generally and also specifically for the machine operators using the C-part. Detailed historical and real time data informed forecasts that, in turn, informed sourcing and inventory optimization. For example, if a customer planned to increase output by 10 per cent, Bossard could predict the need for C-parts through ARIMS, often more accurately than the customer’s own predictions. Customers could integrate data generated by ARIMS with their own enterprise resource planning (ERP) system.

ARIMS was operating with a single server platform that was accessible worldwide from a mobile app. Thus, factory supervisors or top management could, from a mobile phone or tablet, monitor the stock in every bin along with usage data and the refill schedule. In factories that did not allow mobile phones or tablets on the shop floor, wall mounted monitors provided this function while protecting confidential data on the shop floor. ARIMS provided customers with real time data of (1) item description and measurements, (2) refills for the past year for each bin, (3) stock in each bin in real time, enabling quick inventory, and (4) orders in process with projected delivery times.

Security was essential for customers to trust the system. ARIMS thus employed state of the art security features. Special interface software could safely bridge ARIMS with a customer’s own ERP systems. Data was encrypted and converted into the appropriate format—for example, a mirror archive—and then sent to the customer. The customer’s firewall identified the Internet Protocol (IP) address and then scanned documents to import data into the ERP system. Bossard emphasized the security features of its systems:

Unauthorized data access, data abuse, and system failure can seriously disrupt operating processes. To prevent this, we use technical measures such as access authorization, virus scanners, firewalls, and backup systems. Our IT systems are continuously monitored and updated in order to meet the latest requirements. We have an emergency concept that includes daily backups and data mirroring. Detailed internal policies govern how we use hardware and software.

Value for Customer, and Pricing

Bossard’s main sales pitch focused on the concept of total cost of ownership (TCO), which referred to the total cost incurred to secure a specific C-part, such as a screw, at the specified quality and available at the right place at the right time in a manufacturer’s plant. Bossard estimated that 85 per cent of TCO was typically operating costs related to purchasing, order processing, quality control, and internal logistics, while only 15 per cent was the actual cost of the C-part. Bossard proposed that its service solution enabled manufacturers to reduce the 85 per cent, hence achieving savings far greater than the cost of the C-part.

Bossard developed a standard cost calculation and process analysis method. The company conducted a value stream analysis of the customer’s operations and C-part logistics, and identified optimization potential in design and production processes. Using a set of key indicators, Bossard experts could calculate how much money the customer could save by using Bossard’s logistics systems.

Bossard priced different aspects of its services separately, thus providing different service packages to different clients. For example, Bossard rented the bins along with its logistics system and the associated software. Customers opting for a frequent or automated delivery schedule paid a flat fee for the service plus the price of each C-part delivered through the system. Consulting services were available separately, notably to clients aiming to develop logistics systems that did not involve C-parts from Bossard’s product portfolio.

International Growth

Since the 1980s, Bossard had been growing its international operations, and by 2015, was operating worldwide in 26 countries with more than 60 service locations, 35 logistic centres, and 12 application engineering laboratories. In Europe, Bossard was serving clients primarily from its central warehouse in Zug, with additional warehouses in Denmark and France. With border controls removed within the European Economic Area, Bossard trucks could smoothly travel across the continent and secure timely and reliable delivery. Outside Europe, Bossard needed to establish a local distribution infrastructure to be able to deliver the same level of service. Thus, in Asia, Bossard had 14 logistics centres, including four each in China and India. These regional warehouses provided all parts commonly used in their region; orders for less common parts were sent directly from Zug, by air freight if necessary.

Bossard’s global footprint had been growing gradually at similar paces around the world (see Exhibit 2). Europe accounted for 58 per cent of sales in 2015, compared to 59 per cent before the financial crisis in 2008. North America accounted for 25 per cent (28 per cent before 2008) while Asia Pacific accounted for 16 per cent (14 per cent before 2008) (see Exhibit 5). Over the years, there had been some volatility, as all markets had been affected by the financial crisis in 2008, but Asia Pacific had recovered faster than either Europe (2013) or North America (2015). Products were sourced from long-term suppliers around the world including India, Brazil, and other emerging economies. While Bossard’s market share was lower in Asia Pacific than in Europe, the operation in the region was highly profitable.

Bossard’s international growth was accelerated by acquisitions that strengthened its positions in key markets. The largest acquisition was KVT-Fastening, acquired in 2012 from the KVT Koenig Group in Germany for CHF 200 million. KVT-Fastening produced high-quality specialist fastening and sealing applications, had 230 employees, and generated a turnover of about CHF 120 million with businesses mainly in Germany, Switzerland, Austria, and Central Eastern Europe. In 2015, Bossard completed three smaller acquisitions of fastening product providers: (1): Aero-Space Southwest in the United States, (2) the fastening solutions division of Avio Elettronica in Italy, and (3) a 60 per cent equity stake in Torp Fasteners in Norway, a market leader in Scandinavia. The target companies operated in geographies or product segments with minimal overlap, and thus could be smoothly integrated into the Bossard organization. In the post-acquisition integration, Bossard shared its logistics methodology to enhance the competitive position of the target companies.

Bossard’s business model had been developed in Switzerland and neighbouring countries where costs of manual labour were high, so saving time spent by employees on routine tasks translated to substantive cost savings. Selling Bossard’s full service solution was more challenging in contexts where labour costs were lower or where precision and reliability were less important because additional staff could easily perform deliveries and adjustments. Many of Bossard’s customers were themselves internationally operating industrial enterprises, such as ABB Group and Bühler, with global supply chains and global procurement networks. The ability to deliver consistent quality and reliable local service at multiple locations was a key supplier selection criterion for these global customers. Bossard promised to deliver to its customers the same quality of service in each of the 27 countries where it was operating.

In 2015, the sharp appreciation of the Swiss franc, caused by the Swiss National Bank’s decision to abandon the currency peg against the euro, created new challenges and opportunities for Bossard. The value of the Swiss franc increased from €0.83 at the end of December 2014 to €0.96 at the end of January 2015, before settling down a little to €0.92 by the end of 2015 (see Exhibit 1).[[2]](#footnote-2) The consequences of the strong Swiss franc were threefold. First, some key clients moved their production overseas and wanted to take their logistics service provider with them; in many cases, Bossard’s existing overseas subsidiaries or partners could serve these clients. Second, Bossard’s own operations in Switzerland became less price-competitive in segments where it was competing with service providers based in the Eurozone. Third, the profit contribution of overseas operations was lower after conversion to Swiss francs, Bossard’s accounting currency.

Operations in China

Bossard first entered the Chinese market in 1999, establishing Bossard Industrial Fasteners International Trading (Shanghai), and opening offices in Beijing, Tianjin, Suzhou, Nanjing, Xiamen, and Shenzhen. By 2005, China had become the fifth-largest market for Bossard, but profit margins remained low compared to European markets. Over the next years, Bossard continued to invest in its infrastructure in China, including, for example, investments in its internal ERP system in 2007.

The Chinese market was more resilient than Europe’s or North America’s during the fiscal year 2008/09, but in the early 2010s, growth slowed as Chinese export growth slowed. (Many of Bossard’s Chinese customers were producing in China for global markets.) Nevertheless, Bossard continued to build its infrastructure to offer services to customers in China at the same level as provided in Europe. By 2016, Bossard had full logistics hubs with an office, a warehouse, and a laboratory in Beijing, Shanghai, and Shenzhen, plus 10 further regional offices across the country.

China was Bossard’s most important market in Asia Pacific, contributing almost half of the revenues in the Asia Pacific region. Despite these investments, however, the Chinese market continued to be seen as challenging, as summarized in the letter to shareholders in 2015:

Our investment policy is also paying off in the Asian markets. We have again made visible progress, which is reflected in our excellent sales performance. This is particularly the case for India and Korea where we posted double-digit growth rates. By contrast, business in China is proving more challenging, an experience we are sharing with other suppliers of industrial products and services. . . . [A] question mark will remain over the development of the key Chinese market.

Underlying the slower than projected growth were several operational challenges. First, Chinese manufacturing had traditionally been very labour intensive, so modern logistics that reduced labour input were not as appealing to factory owners in China as they were to owners in Europe. Foreign-owned companies often introduced the same logistics systems across their operations worldwide, and thus partnered with Bossard; however, local businesses were growing faster than foreign-owned, and were increasingly aiming for middle and upper market segments where product durability and reliability were more important. At the same time, wages for skilled workers were increasing faster than productivity, especially in manufacturing hubs such as the Shanghai–Suzhou area. These structural changes in Chinese manufacturing created opportunities for Bossard, provided it was able to convince local entrepreneurs of the value that its services added.

Second, Bossard provided C-part management to its clients, and its sales pitch focused on the concept of TCO, but the concepts of C-part management and TCO were not yet well appreciated by many local businesses. They tended to be very price focused, being accustomed to operating with narrow margins and readily available low-skilled labour. Thus, Bossard needed to find an appropriate marketing strategy to convince clients in China to purchase its more expensive fasteners while paying for add-on services. A critical element of the marketing strategy had to be the establishment of trust; only clients that trusted Bossard to deliver exactly what they promised would be willing to share sensitive data and, eventually, place critical elements of their logistics into the hands of an external partner.

Third, Bossard needed to convince potential clients to change their entire logistics system; hence, they needed to negotiate directly with the relevant chief operating officer. Sourcing managers in charge of specific C-parts would rarely be effective intermediaries because they were neither authorized to make such big decisions nor motivated to adopt more automated systems. A fully integrated, data-driven system would not only change the job requirement for in-house sourcing managers but would also make some work in traditional sourcing functions redundant.

Finally, especially when opening new operations, Bossard experienced the challenge of recruiting and retaining appropriate staff and service partners, such as distributors that would deliver the C-parts to clients. It was difficult to find people who shared Bossard’s intrinsic appreciation of quality of products and service; Bossard needed to invest substantial training to develop a service mindset among its employees. Moreover, when recruiting staff, Bossard did not benefit from the same name recognition of well-known multinationals in consumer brands. Fluctuation of staff after initial training was high, though with adaptation of management practices, including participation plans and performance-based pay, this improved.

Outlook

As Bossard was considering its long-term growth strategy, it was clear that China-based manufacturers would play a central role in its future growth. Bossard had a solid foothold in China, along with a local physical infrastructure, a network of partners, and solid client relationships with some of the world’s leading manufacturers, such as those in the machine tool sector. However, sustained and profitable growth would require growing its client network to also include local companies. An action plan was needed.

Exhibit 1: Bossard Group—Key Financials (In CHF ‘000, unless otherwise indicated)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **2012** | **2013** | **2014** | **2015** | **2016** |
| Net sales | 485,224 | 605,716 | 617,764 | 656,314 | 695,015 |
| Gross profit | 151,390 | 188,807 | 197,131 | 202,704 | 219,649 |
| Personnel expenses | 98,885 | 123,388 | 129,401 | 135,903 | 145,668 |
| EBITDA | 58,820 | 82,098 | 85,252 | 81,922 | 91,114 |
| Net income | 43,505 | 56,001 | 57,128 | 54,490 | 62,434 |
| Capital expenditures | 24,983 | 14,901 | 11,536 | 22,128 | 40,021 |
| Operating net working capital | 202,225 | 211,472 | 242,282 | 256,321 | 264,557 |
| Net debt | 202,185 | 101,163 | 97,875 | 147,858 | 158,767 |
| Shareholders' equity | 51,861 | 167,298 | 210,603 | 186,186 | 207,644 |
| Total assets | 376,217 | 386,951 | 434,380 | 462,602 | 495,769 |
| EBITA (% of net sales) | 12.1 | 13.6 | 13.8 | 12.5 | 13.1 |
| Net income (% of net sales) | 9.0 | 9.2 | 9.2 | 8.3 | 9.0 |
| ROE (%) | 33.6 | 51.1 | 30.2 | 27.5 | 31.7 |
| ROCE (%) | 17.2 | 22.8 | 20.7 | 17.6 | 18.5 |
| Earnings per share (A-shares) | 7.29 | 7.40 | 7.49 | 7.01 | 8.04 |
| Price/earnings ratio (on Dec. 31) | 9.20 | 14.00 | 14.60 | 15.60 | 17.80 |
| Average employees (#) | 1,551 | 1,767 | 1,806 | 1,950 | 2,012 |
| Exchange rates at year end: |  |  |  |  |  |
| CHF/USD  CHF/EUR | 1.09  0.83 | 1.12  0.82 | 1.01  0.83 | 1.01  0.92 | 0.98  0.93 |

Note: CHF = Swiss francs; EBITDA = earnings before interest, taxes, depreciation, and amortization; EBITA = earnings before interest, taxes, and amortization; ROE = return on equity; ROCE = return on average capital employed.

Source: Company documents.

Exhibit 2: International Sales Profile (in CHF)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| Europe | 322.4 | 216.4 | 252.3 | 261.2 | 251.7 | 369.3 | 394.7 | 383.4 | 401.6 |
| The Americas | 153.2 | 109.0 | 127.0 | 122.8 | 140.7 | 133.0 | 122.0 | 166.2 | 186.1 |
| Asia Pacific | 73.7 | 58.3 | 85.1 | 78.7 | 78.8 | 87.9 | 101.1 | 106.7 | 107.3 |
| Total | 542.8 | 379.9 | 458.7 | 457.7 | 471.2 | 590.2 | 617.8 | 656.3 | 695.0 |

Note: CHF = Swiss francs.

Sources: Company documents.

Exhibit 3: Customer Experiences—Stadler Rail

Stadler Rail was a manufacturer of regional and urban trains and tram sets. It was operating in 19 locations in 10 countries in Europe and had recently established a plant in the United States. The manufacture of train sets involved many types of production processes, including high volume production of standardized parts; small volume, labour intensive assembly of trains and carriages; and repairs requiring that every task was customized. Stadler’s challenge was to optimize its C-parts order management across this variety of operations.

In its central plant in Bussnang, Switzerland, Stadler had a central warehouse where suppliers delivered their parts, and from where workers ordered and collected C-parts they needed on the production line or to fill their trolleys of parts and tools. Stadler’s purchasing unit managed 2,400 parts, handled 1,600 orders with 7,300 order positions per year, and paid 1,600 invoices from 23 suppliers. Bossard implemented a full service smart factory system with a combination of SmartBins and SmartLabels, providing workers on the production line with full information about their C-parts supplies. With the Bossard system, Stadler no longer had to manage any parts, or handle any orders, and paid only 12 monthly invoices from a single supplier— Bossard.

The blue Bossard boxes were visible in every part of Stadler’s operations. The logistics varied with the nature of the production processes: undercarriages, also known as boogies, were built on highly standardized assembly lines where shelves with SmartBins at the point of use were the ideal solution. The final assembly required more flexible arrangements; each worker had their own mobile trolley stacked with SmartBins containing the relevant parts they needed on the day, which could vary depending on what type of train the worker was assembling. With Bossard’s logistics systems, Stadler was able to make quicker decisions, reduce total cost of ownership (TCO), and increase delivery performance. Its order management cost was reduced by an estimated 40 per cent.

Source: Company documents.

Exhibit 4: Customer Testimonials

The traction converter is at the heart of every train. We produce such converters in the ABB plant in Turgi [Switzerland]. Our customers—train manufacturers—have high expectations of us. To cope . . . , we need lean workflows, flexible processes and, of course, maximum productivity.

Since the implementation of SmartBin, I haven't come across any missing C-parts. This ensures reliability and lies at the heart of process stability and timely handling and delivery of our products. I firmly believe that the close partnership between Bossard and ABB was a crucial factor in the project’s success—a quantifiable success that is evident each and every month. That’s what I call Proven Productivity.

Thomas Siegenthaler, Head of Production Traction Converters, ABB Switzerland Ltd.

Bühler is a world-leading producer of food processing machinery. There are many successful cases of our cooperation with Bossard in joint project teams.

We are working together on our global supply chain. This includes products as well as efficient processes. Bossard shows us product solutions and logistic concepts, like SmartBin, that help us to reduce costs and to improve productivity. I think this is the biggest value Bossard brings to us.

YD Meng, General Manager, Bühler (China) Machinery Manufacturing Co., Ltd.

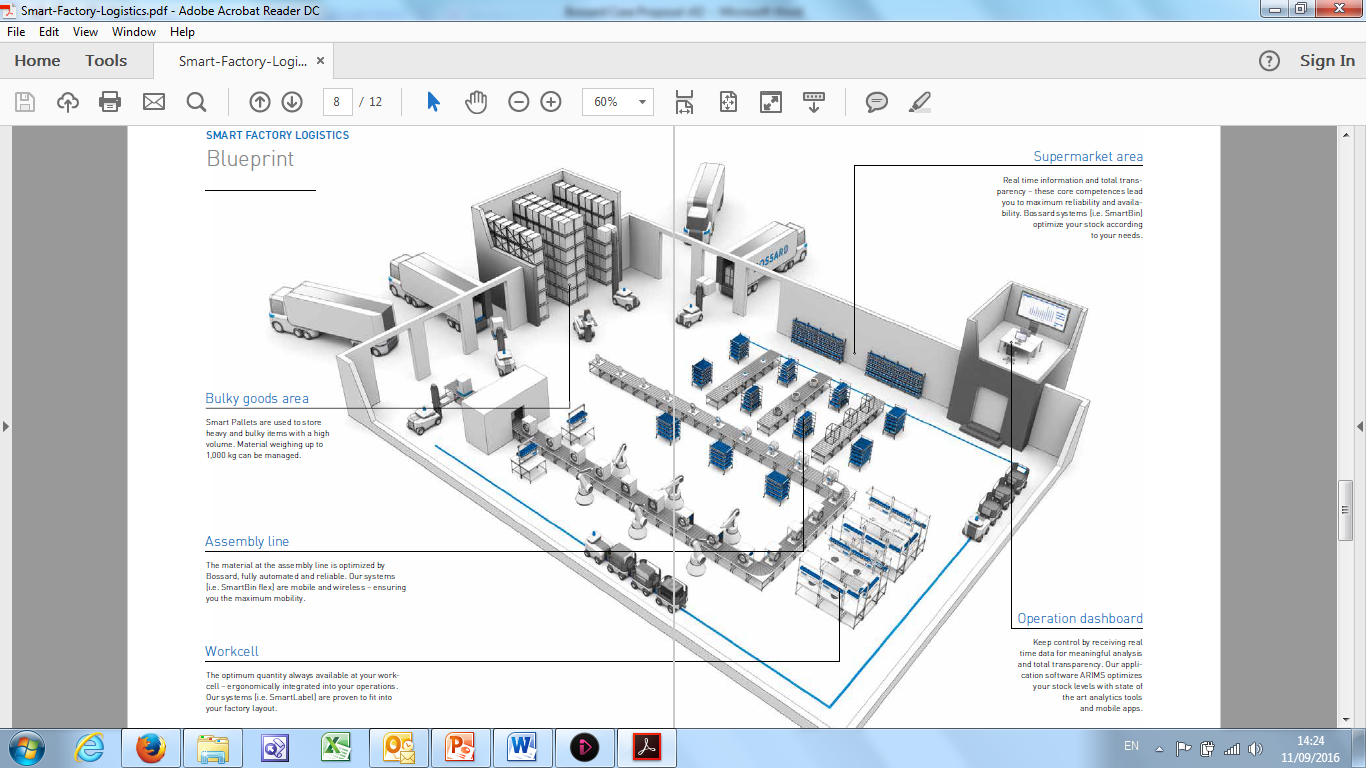
At SDLG’s headquarters in Linyi [China], we produce 20,000 excavators and 50,000 wheel loaders every year. For us, safety is our top priority.

Initially, screws from other suppliers were breaking during the assembly. Now, the fastener solutions from Bossard guarantee the safety of our machines, which helped us to lower process costs and to increase productivity. In addition, by introducing SDLG to SmartBin, we were able to reduce our stock level by 75% without compromising availability. We will for sure strengthen our cooperation with Bossard for improved product solutions and logistics.

Shi Yanyu, General Manager Excavator Division, SDLG Construction Machinery Co., Ltd.

Source: Company documents.

Exhibit 5: Intra-Factory Logistics Using Bossard Systems



Source: Company documents.

Exhibit 6: Customized Service Solutions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Functions** | **Solutions** | | | | |
| **2Bin** | **Code** | **SmartCard** | **SmartLabel** | **SmartBin** |
| Order release | manual | manual | semi-automatic | semi-automatic | automatic |
| Real time order and delivery information | web-based | web-based | web-based | local | web-based |
| Refill recognition | --- | --- | --- | yes | automatic |
| Automated error recognition | --- | --- | partial | yes | yes |
| Flexible placement | partial | yes | yes | yes | yes |
| Point of use | -- | partial | yes | yes | yes |
| Connected to ARIMS online platform | yes | yes | yes | yes | yes |

*Source*: Company documents.

1. CHF = Swiss franc; CHF 1 = USD 1.01 and EUR 0.92 at the end of 2015 (see Exhibit 1). EBITDA = earnings before interest, tax, depreciation, and amortization. [↑](#footnote-ref-1)
2. € = European euro; US$1 = €0.83 on December 31, 2014. [↑](#footnote-ref-2)