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The Business Case for Automation

Many electronics manufacturing companies are now looking at key strategies ahead of the next peak production season, to avoid issues experienced last year, to increase operational performance and flexibility to meet expected growth, and to streamline operations to reduce costs and increase competitiveness. In 2016, this examination has become all about how to increase automation.

In recent years, automation has become more cost effective and more processes are able to be automated. On the face of it, the business case for automation is compelling because labor is a fixed cost. Automated processes for assembly run faster than manual processes. Automation isn't distracted on the job; it executes a consistent programmed operation so that performance variation is minimized. The calculation of ROI is often simply based on the investment cost of the automation divided by the rate of products produced per hour, which is compared to the manual process that it replaces.

ROI Challenges

This simple ROI model does not tell the whole story. Take a well-known example of existing automated processes, SMT placement machines. After many years of refinement, SMT machines are now fast, effective, productive, and reliable. In the past, with high-volume production dominant, the efficiency of the SMT program was critical because it would run for hours, days, or weeks, and every last

percentage point of performance improvement represented a great deal of money. Today, with an increasing mix of products to be made on each production line, frequent changeovers occur. The raw performance of the machine program is no longer as significant because the machine is stopped longer as the changeovers are done, involving many hundreds of materials needing setup and verification.

This is a key issue that applies to all automation. Dedication of automation to a single task executed in a simple way is relatively easy to achieve. Making automation that is more flexible, that can also achieve utilization and efficiency targets, is a little harder. The challenge is how to manage the variation required of the automation to achieve the ROI that was expected, even with an increased product-mix environment.

SMT Example

The productivity of SMT machines is inversely proportional to the number of product changeovers. The degree to which this affects productivity is often hidden and so can easily be underestimated. The history of how the changeover issue has been dealt with in SMT production illustrates the issue in more detail. Losses are incurred by having to

change all of the feeders on the production line between products. In high-mix production scenarios, SMT machine lines can be doing changeovers for more time than they are actually producing. A solution was the creation of common feeder setups so that a group of products would share a feeder setup, based on the commonality of products. This significantly reduced the number of feeders that needed to be changed between products in the group, but with a significant hidden side effect.

The machine programs for each of the products in the group were substantially less efficient than the ones made specifically for each individual product because the efficiency of the machine programs depends on the positioning of the feeders. Program efficiency reduction of around 35% is not unusual. Because the production plan was based on the program time, this loss often went unseen. Another solution to the changeover problem was to use removable feeder trolleys so that feeders could be changed more quickly, with less feeder commonality required.

Again, this came with an often unseen significant side effect, the cost of which quickly became the huge amount of material stock and additional feeders required, as

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well as space required on the production floor. Over time, after trying various methods and techniques, many factory operations running higher mix production are left in the situation where their SMT operations are inefficient, with only 40% absolute productivity. However, reported productivity levels continue to be shown as 80%, hiding the losses. The introduction of additional automation into factories in an increasing mix of production will mean that the calculated throughput of the automation used to justify the ROI may be only half what was originally expected.

Smart Factory 1.0 and Industry 4.0

For an existing factory to perform in a more flexible way without making huge changes or investment, and without significant loss of productivity, has been a challenge for many years. This has led to the innovations of smart factories and Industry 4.0, which, in themselves, are not easy strategies to adopt. As reported in a recent announcement from Mercedes Benz, in one of its factories producing the latest range of luxury cars automation has actually been removed from the final assembly line and replaced with manual operations because the automation could not keep pace with the volatile demand variation of customer orders. We have a choice to go forward toward automation or perhaps to step backward, with human beings providing the ultimate flexibility.

Many companies in the industry, to one extent or another, have climbed aboard the Industry 4.0 or Smart Factory bandwagon. The computerization solutions identified as Industry 4.0 and the solutions for smart factories in China have a lot in common. They both focus on reducing labor and consider increased automation a solution. With any investment in new hardware, ROI is a key consideration, but not only absolute investment. Automation can also increase the capacity of the factory, which can be measured as the number of products produced per square meter. Increasing this key metric will increase the capacity of the business without the need for investment in new building, relocation of production, etc. The solutions associated with Industry 4.0 also are applicable to smart factories, reducing the shop-floor space needed for materials and the number of operators, while increasing

visibility, flexibility, and productivity within existing equipment.

The Internet of Manufacturing

Without an established standard for communication, manufacturing equipment vendors have developed and implemented whatever communication methodology they like. SMT machine communication was originally based on the need for development and fine-tuning of machine performance. Because machines from different vendors can have fundamentally different operational mechanisms, the parameters, format, and protocols for communication all started out with different paths. As customers wanted to replace their manual methods of production data collection with automated methods, they requested information in various ways from machine vendors. For key customers, especially where working with third-party software vendors, machine vendors have allowed access to certain protocols and formats that in some way met the customers' needs. The largest machine vendors, such as ASM and Fuji, created their own proprietary formats that would work with their latest machines in order to reduce the number of individual requests they had to support. This approach initially reduced their costs, and then went on to create for them an additional revenue stream.

Other SMT vendors, and vendors of related equipment such as inspection, printing, reflow, and test, had less resource and opportunity to do this, and so became excluded. Looking beyond the automated processes at the manual operations in the lines, the interfaces become user interfaces, part of some form of software solution at the process level itself. The many varied potential uses of data in smart solutions creates a significant barrier, as somehow all of these different processes need to be supported. Using a common communication platform would reduce the barrier significantly.

For adopting computerized control over existing automated processes and to enable more intelligent and flexible automated processes in the future, the new Internet of Manufacturing communication standard must represent all events of significance on the shop floor, not only those from machines. As a solution, the new Open Manufacturing Language (OML) was created to specifically address all of these communication issues. The OML specification defines the way in

which information can be exchanged between automated and manual processes and systems, both data format and content.

The age of the Internet of Manufacturing and OML brings with it a completely new chapter of value creation from data from all kinds of machines and processes, where individual vendors are able to share information and to create value in their own products through the use of OML data from others. But how to apply any new standards to machines and processes currently in use on the shop floor? Machine vendors will understandably resist the expense of having to apply standards for machines currently in use in the market to machines that are up to 20 years old, designed way before the Internet of Manufacturing was conceived.

The answer comes in the form of Mentor Graphics' Valor IoT Manufacturing hardware solution. This is a device that converts existing machine data into OML data and provides a network infrastructure. Embedded within the Valor IoT Manufacturing hardware is support for connection of every existing machine process on the shop floor, with the conversion of acquired data into OML standard format. Connecting the Valor IoT Manufacturing device accelerates the adoption of OML and allows it to be deployed universally. This allows Industry 4.0 and Smart Factory computerizations to be effective across the entire factory operation. Valor IoT Manufacturing provides data connections for automated and manual processes, and for operational activities such as material verification and logistics, and it provides a robust, secure infrastructure for OML data flow.

For complex SMT equipment, the Valor IoT Manufacturing option can fast-track integration of existing equipment, meaning that Industry 4.0 tools can become a reality without the need to invest in needless asset replacement, and without the need to wait. Existing MES and ERP systems can also now access shop-floor information easily, bringing a new level of effectiveness. Finally, new Industry 4.0 computerization functions can be implemented, as in-house-developed solutions, machine vendor-supplied solutions, or third-party solutions such as Valor MSS from **Mentor Graphics**.

Editor's Note: We thank Michael Ford, Senior Market Development Manager at Mentor Graphics, for preparing this article.

Poor Start for US-Traded Group

Combined first-quarter revenue for the six largest US-traded EMS providers declined 0.3% year over year, a poor start on which to build a growth year. In Q1, the six providers generated sales totaling \$14.3 billion, down from \$16.2 billion in the year-earlier period. The prime reason behind this decline was the poor performance of Benchmark Electronics, which decreased its sales by 11.5% year over year. Next was Plexus, which posted a 5% decline. Despite the group's decline of 0.3% from a year earlier, sales performance varied widely, ranging from Sanmina's with 5.5% growth to Benchmark's double-digit decline (Table 1A, below).

On a sequential basis, the group's revenue fell by 12% in Q1, a quarter in which segments such as consumer electronics and computing are prone to seasonality. Sales declines at four providers prevailed, with Jabil, Flex, Benchmark Electronics, and Celestica registering double-digit drops. Two companies (Sanmina and Plexus) out of the six were able to grow their sales from the prior quarter.

Five out of six providers follow

GAAP accounting rules, while the sixth, Celestica, adheres to IFRS reporting standards. For the five GAAP companies, GAAP gross margin in Q1 was a combined 9.7%, down 50 basis points sequentially, with flat growth year over year. Flex, Sanmina, Plexus, and Benchmark succeeded in raising their gross margins from Q4 2015, while all but Plexus improved their margins from the year-earlier period.

Together, the five companies in Q1 produced a GAAP operating margin of 2.9%, down 30 basis points sequentially and down 20 basis points year over year. Two providers—Sanmina and Plexus—turned in increased GAAP operating margins, led by Plexus with a 0.4% result, while all but Flextronics and Plexus had their margins decline from the year-earlier period. As for the lone IFRS reporting company, Celestica's IFRS operating margin increased from the previous quarter and the year-ago period (Table 1A).

On a sequential basis, combined GAAP net income for the five companies in Q1 fell far faster than sales did. Aggregate net income of \$198.1 million dropped 45.2% in contrast with a sales decline of 12.2%. Net income was down from the prior quarter at three out of five companies,

Plexus being the exception. In the year-over-year comparison, total GAAP net income for the five companies sank 17.6%, with sales decline of 0.8%. Flex posted the biggest decline, whereas Sanmina reported highest growth at 105%. Q1 net margin for the GAAP reporting companies was 1.53%, down 92 basis points sequentially and 31 basis points year over year.

Tepid First Half Projected

Combined revenue growth of the six largest US-traded EMS providers in the first half will be underwhelming, if MMI's estimates hold true. MMI is projecting that the group's first-half sales will total \$28.57 billion, up 0.1% year over year. Given this small projected increase, hopes for a growth year now rest on the group's second-half performance.

According to MMI's estimates, first-half sales will grow from a year earlier at two out of six providers, with single-digit gains projected for Sanmina and Celestica, whereas Benchmark Electronics is expected to report a double-digit decline. Sales increases at those two providers cannot outweigh revenue declines at the

Table 1A: Q1 2016 Results for the Six Largest US-Traded EMS Providers (M US\$ or %)

Company	Q1 '16 sales	Q4 '15 sales	Qtr.-qtr. chg.	Q1 '15 sales	Yr.-yr. chg.	Q1 '16 gross marg.	Q4 '15 gross marg.	Q1 '15 gross marg.	Q1 '16 oper. marg.	Q4 '15 oper. marg.	Q1 '15 oper. marg.	Q1 '16 net inc.	Q4 '15 net inc.	Q1 '15 net inc.
Flextronics	5,773.0	6,763.2	-14.6	5,951.6	-3.0	7.0%	6.4%	6.2%	2.0%	2.3%	3.0%	61.0	148.9	135.1
Jabil	4,403.6	5,208.0	-15.4	4,309.3	2.2	8.9%	9.1%	8.4%	3.5%	4.1%	2.9%	78.9	131.9	52.9
Sanmina	1,611.2	1,534.7	5.0	1,527.5	5.5	8.4%	8.0%	7.5%	3.8%	3.5%	3.2%	30.4	27.1	14.8
Benchmark	549.2	625.7	-12.2	620.9	-11.5	9.2%	9.1%	8.3%	3.0%	3.6%	2.9%	11.1	39.4	14.2
Plexus	618.7	616.7	0.3	651.3	-5.0	8.6%	8.1%	9.2%	3.8%	3.4%	4.6%	16.8	14.4	23.6
Subtotal/avg.	12,955.7	14,748.3	-12.2	13,060.7	-0.8	9.7%	10.2%	9.7%	2.9%	3.2%	3.1%	198.1	361.8	240.6
Celestica	1,353.3	1,514.9	-10.7	1,298.5	4.2	6.7%	6.5%	6.9%	2.3%	1.7%	2.1%	25.6	12.1	19.7
Total/avg.	14,309.0	16,263.2	-12.0	14,359.2	-0.3									

All results are based on GAAP except those of Celestica, which adopted IFRS reporting. With the exception of sales, GAAP and IFRS results are not necessarily comparable.

Table 1B: Q2 2016 Guidance and Estimates for the Six Largest US-Traded Providers (sales in \$B except as noted)

Company	Q2 '16 guidance	Q2 midpoint	Q1 '16 sales	Qtr.-qtr. estim. chg. (%)	Q2 '15 sales	Yr.-yr. estim. chg. (%)	Q1-2 '16 estimate d sales	Q1-2 '15 sales	Estimated change (%)	Q2 guidance adjusted EPS* \$	Q2 EPS midpoint \$	Q1 '16 adjusted EPS* \$	EPS Q-Q chg. at midpoint (%)
Flextronics	5.5 - 5.9	5.70	5.80	-1.7	5.95	-4.2	11.50	11.52	-0.1	0.25 - 0.29	0.27	0.29	-6.9
Jabil	4.1 - 4.3	4.20	4.40	-4.5	4.35	-3.4	8.60	8.66	-0.7	0.12 - 0.18	0.15	0.57	-73.7
Sanmina	1.625- 1.675	1.65	1.61	2.5	1.53	7.8	3.26	3.06	6.5	0.61 - 0.65	0.63	0.63	0.0
Celestica	1.4 - 1.5	1.45	1.35	7.4	1.41	2.8	2.80	2.71	3.3	0.25 - 0.31	0.28	0.26	7.7
Benchmark	570 - 600 M	0.59	0.55	6.6	0.66	-11.9	1.13	1.29	-11.8	0.29 - 0.33	0.31	0.26	19.2
Plexus	640 - 670 M	0.66	0.62	5.8	0.67	-2.1	1.27	1.32	-3.5	0.73 - 0.81	0.77	0.55	40.0
Total/avg.		14.24	14.33	-0.6	14.57	-2.3	28.57	28.55	0.1				

Q2 estimates equal midpoint of Q2 guidance. First-half 2016 estimates equal Q1 sales plus midpoint of Q2 guidance.

*Adjusted EPS may not be comparable from company to company.

other four companies (Table 1B, above).

First-half projections are based on second-quarter estimates set equal to the midpoint of sales guidance for each company.

Estimated Q2 sales for the six providers add up to \$14.24 billion, down 0.6% from Q1 and a decline of 2.3% versus the year-ago period. In the sequential comparison, Q2 sales are projected to rise at four providers but these gains are insufficient to offset an estimated drop at other two providers. Celestica is the only provider with a projected sequential increase of more than 7%. On a year-over-year basis, forecasted sales increases at two providers will not be enough to offset declines for other four providers. Sanmina and Celestica are expected to boost Q2 revenue by single digits from a year earlier (Table 1B).

Guidance suggests that adjusted EPS for the June quarter will increase sequentially for three providers (Plexus, Benchmark Electronics, and Celestica); there will be flat growth for Sanmina. Based on guidance from Plexus, the company expects that adjusted EPS in its June quarter will increase to 40% from the prior quarter.

Some Quarterly Results

Benchmark Electronics (BHE).

BHE reported March quarter revenue at \$549M and EPS at \$0.26. From an end-market perspective the quarter saw the following y-o-y trends: telecom -41% y/y to \$98.9M, medical 2% y/y to \$82.4M, industrial 8% y/y to \$214.2M, computing -16% y/y to \$98.9M, and instrumentation -2% y/y to \$54.9M. Notably, new booking wins in Q1 equated to \$110-140M in annualized revenue with 17 engineering awards and 27 manufacturing wins. Finally, gross and operating margins came in at 9.2% (82 bps y/y) and 3.5% (-33 bps y/y).

Benchmark end markets and financials: a) Computing (18% of sales, -16% y/y): The segment was down -16% y/y and -37% sequentially due to lower than expected demand from a top computing customer. Management noted that the segment should be up 8-12% q/q from a seasonally low Q1.

b) Industrial Controls (39% of sales, 8% y/y): The segment was up 8% y/y and down -2% on a q/q basis and the company cited weakness in oil, reduced infrastructure spend, and overall macro weakness in the quarter. Demand from aerospace has been stable. Management anticipates that this segment should be up 8-12% q/q in March due to new program ramps.

c) Telecom (18% of sales, -41% y/y): The segment was down -41% y/y as the

company faces headwinds from industry consolidation and transition to software. Notably, Benchmark decided to drop a program with a telco customer in providing next-generation products. Management expects to see the segment decline high singles q/q in the June quarter. d) Medical Devices (15% of sales, 2% y/y): The segment continues to grow on a y/y basis, but was down -12% sequentially due to delayed qualification for some medical program ramps. Management guided this segment to be up high single digits on a sequential basis in the June quarter. e) Test and Instrumentation (10% of sales, -2% y/y): The segment was down on a y/y basis, but up 10% sequentially. Looking forward, the company believes this segment would be up mid-single digits q/q in the June quarter.

BHE generated \$77M in cash flow from operations in the March quarter and has a cash balance of \$519M (\$42M in the US). In addition, the company spent \$8M on CAPEX, bringing FCF to \$69M.

Benchmark guided the June quarter to revenue of \$570-600M/EPS to \$0.29-0.33. On a segment basis, it offered sequential guidance as follows: 1) Industrial Controls to be up 8-12%, 2) Medical Devices to be up in high single digits, 3) Test and Instrumentation to be up mid-single digits, 4) Telecom to be down high single digits, and 3.8% at the mid-point (3.6-4.0%).

Celestica, Inc. (CLS).

Celestica reported March quarter results with revenue and EPS at \$1.35B/\$0.26. In an overview of end markets, CLS saw sequential results as follows: Storage – 27% q/q, Communications –9% q/q, Diversified +2% q/q, Consumer flat q/q, and Server decreased –23% q/q. Notably, operating margins came in at 3.3%, up ~20bps q/q. Operating margin was impacted by better performance associated with solar. Lower tax resulted in a \$0.02 benefit to EPS.

End-markets analysis: a) Consumer (3% of sales): The consumer end market was flat q/q but remained at 3% of total revenue. b) Communications (38% of sales): Sales in the communications market were down –9% q/q and flat y/y. Looking into the June quarter, Celestica expects the segment to be up low teens q/q and up low single digits y/y. c) Storage (16% of sales): The storage end market was down –27% q/q and down –7% y/y. Looking into the June quarter, Celestica expects this segment to be up mid-20% q/q and flat y/y. d) Servers (9% of sales): Sales into the server end market were down –23% q/q and down –14% y/y. Notably, the company expects sales to be flat q/q and down low double digits q/q. e) Diversified (34% of sales): Management continues to expand its presence into other diversified end markets by gaining market share with new and existing customers. Notably, revenues in this end market were up 2% q/q and up 24% y/y. The company is guiding the segment to be up low single digits q/q and up high teens y/y.

CLS saw FCF of –\$34.4M and CAPEX of \$16.1M in the quarter. Inventory turns decreased to 6.1 turns due to a slowdown in demand at the end of the quarter as well as higher inventory to manage ramps.

Celestica is forecasting June quarter revenue of \$1.4–1.5B and EPS at \$0.25–0.31. In addition, it guided operating margins to 3.5%. From an end-market perspective, Celestica expects the following in the June quarter: Communications to be up low teens q/q and up low single digits y/y, Diversified to be up low single digits q/q and up high teens y/y, Servers to be flat q/q and down low double digits q/q, and Storage to be up mid-20% q/q and flat y/y.

Sanmina Corporation (SANM). The company reported March quarter revenue/EPS of \$1.61B/\$0.63. Overall, the margin profile was 28 bps higher, with operating margins coming in at 4.1%. Finally, Sanmina saw the following end-market dynamics: a) Communications: This Communications to be up low teens q/q and up low single digits y/y, Diversified to be up low single digits q/q and up high teens y/y, Servers to be flat q/q and down low double digits q/q, and Storage to be up mid-20% q/q and flat y/y. segment was down –3.5% q/q from typical seasonality. b) Industrial/Medical/Defense was up 11.7% q/q, driven by strong demand in the industrial segment. c) Computing and Storage was up 8.1% q/q, driven by solid overall demand. Finally, from a customer perspective, SANM noted that its top 10 customers represented 53.9% of total revenue.

SANM end-market analysis: a) Communications (36% of sales): Sales were down –3.1% sequentially to \$580M due to typical seasonality. The company expects the segment to be up q/q in the June quarter, driven by an overall stable environment, especially in mobile broadband and legacy products. b) Computing and Storage (22% of sales): Sales in this segment were up 10.0% sequentially to \$354M; Sanmina noted that the segment saw solid demand in the quarter. It guided the segment to be flat into the June quarter, due to solid pipelines. c) Industrial/Aerospace/Defense (42% of sales): Sales were up 10.2% sequentially to \$677M, driven by strong demand in the industrial segment. The company guided the segment to be up into the June quarter, driven by industrial and new projects, with medical and defense also stable or slightly up.

SANM guided to revenues/EPS of \$1.625–1.675B/\$0.61–0.65. On an end-market basis, the company expects the following: a) Communications Networks will be up sequentially, driven by an overall stable environment, especially in networking and mobile broadband. b)

Defense/Industrial/Medical will be up q/q, driven by industrial and new projects, with medical and defense also stable or slightly up. c) Computing and Storage will be flat on a sequential basis.

Flex International (FLEX).

FLEX reported March 2016 revenue of \$5.77B/ EPS at \$0.29. On an end-market basis, INS was down –10.9% q/q to \$2.2B, IEI was down –2.0% q/q to \$1.2B, HRS was down –0.4% q/q to \$1.0B, and CTG was down –33.7% q/q to \$1.4B. From a margin perspective, operating margins of 3.5% were ~20 bps as a richer business mix and stronger control over operating expenses offset y/y declines in revenue (reflecting declines at Flex's largest customer, and telecom softness).

Flex end-market dynamics and financials: a) Integrated Network Solutions (INS) (38% of sales) was down –10.9% q/q to \$2.2B, which was below previous expectations calling for down mid to high single digits q/q. For the June quarter, Flex expects this segment to be flat q/q. b) Industrial and Emerging Industries (IEI) (21% of sales) was down –2.0% q/q to \$1.2B, which was in line with/slightly above expectations calling for mid single digit declines q/q. Management noted that the June quarter should be up low single digits q/q. c) High Reliability Solutions (HRS) (18% of sales) was down –0.4% q/q to \$1.0B, which was in line with expectations calling for flat revenue q/q. HRS exceeded the target range on margins due to strength in the auto (new customer program ramps) and medical businesses. d) Consumer Technology (24% of sales) was down –33.7% q/q to \$1.4B, which was in line with previous guidance calling for down 30–35% q/q. The decline in this segment is due to the ramp down of **Motorola/Lenovo.**

Flex's inventory came in at \$3.5B, –1.0% y/y, while A/R days increased slightly on a sequential basis to 36.1 days. A/P days were up ~7 days sequentially to 75.6 days.

For the June -quarter, Flex guided revenues/EPS to \$5.5–5.9B/\$0.25–0.29. On a segment basis, the company expects INS to be stable q/q, IEI to be up low single digits q/q, HRS to be stable q/q, and CTG to be down high single digits q/q.

Finally, Flex believes that it will continue to execute on its trailing five-year FCF road map of \$3–4B by FY17, with CAPEX below depreciation.

GPV sets up full-size production in Mexico

The Danish EMS provider GPV (Denmark) wants to get closer to the growing number of customers in the American market. For this purpose, the company has started a factory in Guadalajara in Mexico.

GPV, which earlier this year was acquired by **Schouw & Co.**, has begun its own production in an area of 5,000 square meters in Guadalajara. The purpose of this is to strengthen GPV's opportunities in the North American market, which is currently experiencing high growth, and in the Central American markets, where especially the Mexican industry shows good progress.

GPV is already well into the planning process and expects to be able to deliver the first products from Mexico at the end of 2016. After the start-up, a full SMT production line is to be established, and within 18 months, another SMT line is expected to be put into service, as reported by Evertiq.

Fideltronik Laying Off in Sweden

Polish EMS provider Fideltronik is planning layoffs of more than 50 percent of the staff at the Swedish facility in Herrljunga.

This measure affects 55 blue-collar employees and 20 officers out of the plant's total of 140 employees. The background for this is that one of the factory's main customers wants to move production to Poland, reports Evertiq.

Foxconn to Take Over Microsoft Phone Factory

Microsoft Corp. announced that it has reached an agreement to sell the company's entry-level feature phone assets to FIH Mobile, Ltd., a subsidiary of Hon Hai/Foxconn Technology Group, and HMD Global, Oy for \$350 million. As part of the deal, FIH Mobile, Ltd. will also acquire Microsoft Mobile Vietnam—the company's Hanoi, Vietnam

manufacturing facility. Upon the close of this deal, approximately 4,500 employees will transfer to, or have the opportunity to join, FIH Mobile, Ltd. or HMD Global, Oy, subject to compliance with local law.

Microsoft will continue to develop Windows 10 Mobile and support Lumia phones such as the Lumia 650, Lumia 950, and Lumia 950 XL, and phones from OEM partners like **Acer, Alcatel, HP, Trinity, and VAIO.**

As part of the deal, Microsoft will transfer substantially all of its feature phone assets, including brands, software and services, care network and other assets, customer contracts, and critical supply agreements, subject to compliance with local law. The transaction is expected to close in the second half of 2016, subject to regulatory approvals and other closing conditions, as reported by Evertiq.

Facilities Expansion... Finnish EMS provider **Salcomp** has decided to set up its second Indian factory in Noida City, close to Delhi.

According to the company there are three main drivers for expanding manufacturing capacity in India: First, the country has become one of the world's fastest growing smart phone markets. Secondly, it is important to be close to customers, and following the introduction of import duties on mobile phones and tablets in 2015, many existing and potential new customers have set up manufacturing operations in northern India. Third, setting up a new domestic tariff area unit optimizes import duties now that new regulation is effective also for mobile phone components such as chargers, battery packs, and headsets.

Salcomp's first Indian factory in Chennai will focus on manufacturing chargers for exports as well as charger-related components for the Noida plant and Salcomp's plants in China and Brazil. The new Noida plant will focus on manufacturing chargers and other products for India's domestic market. With an expanded footprint in India, the company has positioned itself to expand its business scope to other mobile phone peripheral products such as battery packs, headsets, and data cables.

Partnerships... EMS provider **NEO Tech** (Chatsworth, CA) has launched full turnkey system-level manufacturing for the **SkyTrac ISAT-200A** transceiver and flight data acquisition unit. The partnership—which includes engineering services, printed circuit card assembly, and final system integration and test services—is the culmination of a 12-month project by SkyTrac to transition to outsourced manufacturing, something that will allow SkyTrac to launch new products and services to the aviation industry while building manufacturing scale. The Longmont, Colorado location selected to build the SkyTrac products is a NEO Tech Center of Excellence for defense and aviation technology solutions. In the last quarter, manufacturing of the final assembly and test have been seamlessly transitioned into the site. The final test includes complete product functional testing by NEO Tech utilizing the Iridium satellite network, which ensures that the ISAT-200A systems are equipped to reliably report on global fleet positions, in-flight safety events, and engine exceedances.

Lenovo Moves Data Center Hardware Manufacturing to Europe and Flex

Lenovo (Morrisville, NC) will begin to manufacture enterprise products for EMEA customers in Europe, including x86 servers, and its range of storage and networking products for data centers.

With the move, EMEA customers and partners will benefit from faster delivery times and greater flexibility to meet their needs when Lenovo's manufacturing partner, **Flex** (Singapore), begins production of Lenovo's x86 server products in Hungary, the company states in a press release.

Production will begin in summer 2016 and will complement the existing Flex production of the ThinkServer product line as well as a number of other products. A Flex facility in Hungary, dedicated to Lenovo, will produce the full x86 range, including system assembly, the complete range of storage and networking options, and fully integrated racks in order-to-configure custom-build systems.

Flex and Lenovo have been partners for six years and the EMS provider is already involved in the production of a range of products, including PCs, phones, ThinkServers, and tablet repairs. In fact, the Sarvar site in Hungary has just manufactured and shipped its five-millionth PC for Lenovo in EMEA.

The decision to move manufacturing to Europe is said to be based on the benefits arising from establishing production closer to the company's core customer and partner base. Manufacturing in the European Union will enable an improvement of up to five days on delivery times to customers (depending on the country) and lower operation costs (reduced freight costs), which can be passed on to customers and partners.

Divestitures... As part of **Note's** (Sweden) streamlining process, its unit in Oslo has been sold to **Dynamic Precision AS** of Norway. In 2015, the Norwegian operations generated sales of NOK52 million (€5.6 million), but made a negative contribution to Note's earnings... The board of EMS provider **Scanfil Sweden AB** has decided to sell the entire share capital of its subsidiary **PartnerTech Karlskoga AB**, located in Karlskoga, Sweden, for a nominal selling price. The transaction will result in a non-recurring loss of approximately € million for the Scanfil Group and reduce group net debt by approximately € million, which will be posted in the second quarter of 2016. PartnerTech Karlskoga AB manufactures machined products for the defense, maritime, and offshore sectors. Turnover of subsidiary in 2015 was €15.4 million and operating loss €1.3 million. The operations of the plant will be closed down in May 2016. The sale of PartnerTech Karlskoga AB will complete the restructuring of the entire Metal Precision business. The turnover of the Metal Precision business in 2015 totaled €25.0 million and its operating loss was €6.1 million.

New Orders... **Kitron** (Norway) has received an order from **Kongsberg Defence & Aerospace AS** for military communications equipment. Kitron will supply various communications products, and production will be done by Kitron in Arendal. The contract has a value for Kitron of NOK37 million (€3.9 million), and deliveries will take place in 2016 and 2017.

Manufacturing Market Insider, May 2016

The equipment to be supplied is related to an existing contract for deliveries to Hungary.

Stadium Group Opens Design Center in Sweden

Stadium Group (United Kingdom) has opened yet another regional design center, this time located at the Kista Science City in Stockholm, Sweden. The new design center will focus primarily on serving the company's fast-growing wireless business.

The new center will be steered by a team of wireless electronics design engineers and technical sales specialists with expertise in the areas of mobile connectivity, machine-to-machine (M2M), and the Internet of Things (IoT).

The Kista design center is the fourth to be introduced by Stadium over the past twelve months, following the launch, in 2015, of three regional design centers in Shanghai, China and in Southampton and Norwich in the UK. The 200-square-meter office space and laboratory at the Kista Science City was chosen as the primary location for Stadium's wireless design activity, and as the hub for the Group's Technology Board, due to its status as a high-tech cluster, often referred to as Europe's "Wireless Valley," as reported by Evertiq.

Sparton Looking for a Buyer

The board of directors of **Sparton Corporation** (Schaumburg, IL) has authorized **Wells Fargo Securities, LLC** to conduct a process to identify parties interested in acquiring the entire company.

Sparton Corporation has been exploring a range of strategic alternatives. This process, which commenced several months ago, has the goal of identifying the best way to enhance shareholder value. Wells Fargo Securities, LLC, as financial advisor, and Mayer Brown LLP, as legal advisor, have been retained to assist in this process.

According to a press release, the decision was made after considering a number of options presented by Wells Fargo. Sparton and Wells Fargo expect

to begin engaging with interested parties by the end of June.

Facilities closing... Back in February, **Scanfil Sweden AB's** UK subsidiary, Scanfil, Limited, initiated a reorganization of its operations, and at the same time started a communications and negotiations procedure with personnel representatives. The possibility of closing down the production of the plant in Cambridge was also discussed during the negotiations, and now a decision has been made. Based on the final result of the negotiations, Scanfil, Limited's board of directors decided to close the plant. In contrast to an earlier estimate, the closure of the plant is expected to cause nonrecurring costs, which are expected to remain under €1.0 million. The plan is to conclude the closing actions by 25 July 2016; the impact on earnings will be mainly focused on the second quarter of 2016.

Foxconn Moves One Step Further to Become Brand Operator

The move by the **Foxconn Group** to take control of two global technology brands, **Sharp** and **Nokia**, in less than two months has raised concerns that the EMS/OEM giant will eventually transform itself into a brand operator—a title Foxconn has long dreamed of but has not yet attained.

Foxconn previously claimed that its spending of over NT\$110 billion (US\$3.356 billion) to acquire a 60% stake in Sharp is purely an investment project rather than an acquisition deal and that Sharp will continue to keep its brand and operate independently.

But such a claim seems to have been undermined by Foxconn appointing its vice chairman, Tai Jeng-Wu, as Sharp's new president. Additionally, Foxconn chairman Terry Gou also said in a letter that there is a "very regrettable need to reduce workforce" at Sharp after the Japan-based electronics giant reported heavy losses for the fiscal year ended March 2016.

In short, Foxconn will eventually take over the management of Sharp and implement a series of restructuring programs to restore the aging company.

Or, in other words, Foxconn is to manage the Sharp brand from here on by itself.

The recent arrangement under which **FIH Mobile**, an OEM handset subsidiary of the Foxconn Group, and Finland-based **HMD Global** will jointly acquire Nokia's previous entry-level feature phone business and assets from Microsoft for US\$350 million is a further indication that Foxconn is about to break its promise that it would not build itself as a brand operator.

A Chinese-language Commercial Times report indicates that HMD Global will contribute a token US\$20 million to the deal, while FIH Mobile will commit the remainder of US\$330 million to complete the planned transaction.

It is obvious that the Foxconn Group, which will handle design, manufacturing, logistics, and after-sale service of Nokia-branded feature phones, will play a decisive role in how to operate the Nokia brand in the future, as reported by DigiTimes.

Foxconn to Expand in Western China

Foxconn Technology is reportedly building a new factory where it will assemble smart phones for **Huawei**.

The western China provinces are

seen as attractive to manufacturers because of its lower operating costs relative to the eastern rim of the country.

Either directly or through its FIH Mobile subsidiary, Foxconn designs or builds smart phones for **Apple, Huawei, Xiaomi, Lenovo (Motorola), Blackberry, and Oppo**, and just agreed to a deal to acquire the Nokia brand from Microsoft for \$350 million.

Foxconn Cuts 60,000 Factory Jobs, Replaces Them with Robots

Foxconn says it has automated away 60,000 jobs in one of its factories, according to the BBC. The cuts are part of an ongoing process to replace humans responsible for "many of the manufacturing tasks associated with our operations" with robots, the company said in a statement. Foxconn helps manufacture Apple's iPhone and iPad, Samsung's Galaxy phone line, and Sony's PlayStation 4, as well as other devices from many of the world's biggest tech brands.

"We are applying robotics engineering and other innovative manufacturing technologies to replace repetitive tasks previously done by employees, and through training, also enable our employees to focus on higher value-added elements in the manufacturing process, such as research and development, process control and quality control," the statement reads.

Automation is fast becoming a reality for workers in many of the world's biggest corporations, which are finding the falling costs of purchasing robots and programming those robots to be more attractive than retaining human labor.

Overseas, in factories owned by Taiwan-based corporations like Foxconn, the process is accelerating even faster, as reported by *The Verge*.

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