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The Problem of Excess Inventory in EMS

EMS companies do two things really well: They excel at soldering and they are also very good at managing inventory. Material requirements planning (MRP) is the production tool used by manufacturers to schedule and control the inventory and manufacturing process, but if not tightly controlled, it can create excesses that can have a devastating effect on profitability. Sooner or later, an EMS company is going to have an excess inventory problem (either resulting from internal processes or customer imposed)—so wouldn't it be nice to have a tool that mitigates this exposure and allows the principals to see the dynamics of forecasts, yields, orders, cancellations, shipments, and inventory levels, all in one place?

Robert Freid, president of **Contract Manufacturing Consultants (CMC)**, has developed such a tool. The tool doesn't have a name, but Freid describes it as a proprietary simulation model that allows the manufacturer to calculate expected excess inventory quantities on a part-by-part basis after production ends, and presents the dynamics and results in an understandable and usable format.

In the real world, the purpose of an EMS MRP system is to schedule production and to place parts orders (new and change orders)—but this does not allow for dynamic backward

simulation, without customized software. The CMC simulation model was designed for this and to develop “what-if” scenarios of inventory that yield practical excess liability assessments, as well as flexibility in allowing, or not allowing, safety stock. It can also incorporate judgement on key input factors such as a vendor's true cancellation window, which may differ from the vendor's quoted terms, and also takes into account email communications from both parties that may include data not in the EMS MRP. The CMC model is independent of the EMS MRP, which the parties may prefer so as to mitigate real or perceived partiality.

Freid has offered several examples of the CMC simulation model in action. The tool helped resolve an \$18 million lawsuit by an EMS company against a customer for excess inventory damages related to sudden product forecast reduction, purchase order cancellation, and subsequent switch to another supplier. The CMC simulation model

used its backward-looking MRP analysis capability for a part-by-part inventory liability analysis. It illustrated how the contract manufacturer's MRP system should have managed raw materials inventory and vendor orders to support client product-level orders and forecast changes. Model data included the client's rolling forecasts, bills of materials, actual demand, shipments, and component lead times. It also incorporated inventory management algorithms based on common industry practices, including timely buyer corrective actions in response to computer-based MRP-generated messages. Lastly, consideration was given to the contract manufacturer for periods of parts supply shortages and for volatility of client forecasts.

Another example involved assessing Nokia's share of liability in an assembly program dispute with a mid-tier EMS firm. The CMC simulation model provided analysis that included understanding what procurement actions could have and should have been done by the EMS company to mitigate the impact of damages due to a business downturn. The “backward-looking” MRP simulation examined all

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the component materials to quantitatively show a reasonable range of liability. The court discovery documents that were reviewed and analyzed included manufacturing supply agreements; reschedule and stop-work notice history; EMS company past and present claims, including supporting inventory records; bills of materials (BOMs) and approved-vendor lists for all finished goods; printed circuit board assemblies and components related to contractor claims; manufacturing methods and cycle times; and internal and consulting studies.

A final example of the CMC simulation model included a \$28 million claim by **KBM Enterprises**, an Alabama EMS

company alleging that excess inventory and other consequential damages were due to its customer's high frequency of production schedule and product design changes over several years. Products involved were printed circuit board assemblies plus a high mix of finished communications products.

A sample of the CMC simulation model can be seen in Table 1. This model was developed by CMC in 2001 and since refined to assist both customers and EMS companies in evaluating the "share of burden" for excess inventory. The model does not try to replicate or explain all of the many procurement actions that transpire; rather, it illustrates how a

typical EMS company would have reasonably been expected to manage inventory in response to customer forecasts within component lead times and with an aim of controlling excess inventory risk. It treats all parts according to the same prudent MRP principles regardless of value. Model projections of excess quantities are later used as benchmark comparisons to actual after returns but before customer part buy-backs.

The CMC simulation model is by definition an explanatory tool. In most cases, it makes it easier for principals and attorneys to see the dynamics of industry operations so that the accuracy of the results is manifest. For more information, see <http://www.cmcseattle.com/>.

Table 1: MRP SIMULATION

400 SERIES			Y	SAFETY STOCK										
IF-1101-001			Y	CANCELLATIONS										
3,832,454			Y	RETURNS										
\$5,445,010				PROJECTED TTL										
PART / ASSEMBLY			n:	1	2	3	4	5	6	7	8	9	10	
				Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	
1077644	pcba		FG Fcst (@ n-LT)	0	8667	9005	12334	11100	10174	7735	500	500	0	
PCBA, LLC2			FG Shipments (actual)	0	4450	6430	12300	6577	3293	141	36	5	0	
QTY EA / YIELD	2	92.00%												
LT (#b-days) / SS (#wks.)	105	2	Parts Receipts	18860	19596	26864	24196	22172	16836	1104	0	0	0	
MOQ / \$ EA.	92	\$13.12	Parts Cancel	0	0	0	0	-9108	-13708	-1104	0	0	0	
CANCEL / RETURN	C	NR	Parts Returned	0	0	0	0	0	0	0	0	0	0	
FW START (# Mos.)	3		Parts in Shipments	0	-9674	-13978	-26739	-14298	-7159	-307	-78	-11	0	
FW END / EFFECT MO.	3													
RESIDUAL INV (QOH)	47,169	\$618,857	QOH EOM (excl. SS)	18860	28782	41667	39123	37889	33858	33551	33472	34933	47169	
Active / Inactive	Mar-16		Allocated	18860	19596	27951	24196	22172	16836	1104	0	0	0	
Qty Yielded	2.17391		Unallocated	0	9186	13716	14927	15717	17022	32447	33472	34933	47169	
LT (calendar mos.)	5		QOH Safety Stock	0	0	0	6164	6164	6164	12144	13708	12236	0	
1023446	pen		FG Fcst (@ n-LT)	0	4691	7883	12396	8268	8600	5040	810	0	0	
PEN, DRY ERASE, BLACK			FG Shipments (actual)	0	4450	6430	12300	6577	3293	141	36	5		
QTY EA / YIELD	6	98.75%												
LT (#b-days) / SS (#wks.)	25	0	Parts Receipts	28512	47952	75384	48816	44712	34776	0	0	0	0	
MOQ / \$ EA.	216	\$0.78	Parts Cancel	0	0	-1296	-7560	0	-10800	0	0	0	0	
CANCEL / RETURN	C	R	Parts Returned	0	0	0	0	0	0	0	0	0	-58536	
FW START (# Mos.)	1		Parts in Shipments	0	-27038	-39068	-74734	-39962	-20008	-857	-219	-30	0	
FW END / EFFECT MO.														
RESIDUAL INV (QOH)	40	\$31	QOH EOM (excl. SS)	28512	49426	84445	50966	55716	59683	58826	58607	58576	40	
Active / Inactive	Mar-16		Allocated	28512	47952	76804	54937	44712	39698	0	0	0	0	
Qty Yielded	6.07595		Unallocated	0	1474	7641	-3971	11004	19985	58826	58607	58576	40	
LT (calendar mos.)	1		QOH Safety Stock	0	0	0	0	0	0	0	0	0	0	



Some Quarterly Results

Jabil, Inc. (NYSE: JBL). Jabil reported fourth quarter net revenue of \$5.0 billion and fiscal year net revenue of \$19.1 billion. Total sales were up 13% y-o-y, driven by market share gains in EMS up ~2.2% y-o-y, while DMS was up on solid healthcare/packaging and mobility-related products. Operating margins were up 136 bps y-o-y to 3.8%, with EMS margins surprisingly to the upside on end-of-life contracts and cost recoveries that drove ~\$10–\$12 million in incremental profits. The firm beat its target of above \$1B in cash flow from operations (CFO), mostly driven by working capital management, and exceeded free cash flow guidance of \$435 million handily at ~715 million.

JBL expects to post EPS of \$0.65–\$0.91 on revenues of \$5.25–\$5.75B. The firm expects to write off hurricane Maria-related damages to Puerto Rico facilities in 1HFY18, but this will largely be offset by insurance coverage. The firm expects to drive FY18 revenues of \$20–\$21B and reiterated its FY18 PF EPS guide of \$2.60. CFO is expected to be greater than \$1B and capex at ~\$700 million.

Jabil posted solid F4Q17 results above expectations, largely exceeding FCF targets on solid operating margin performance and working capital management. F1Q18 guidance captured expectations, though FY18 guidance points to ~30 bps of margin expansion on higher-than-expected revenues and cost savings from restructurings done in FY17. Overall a solid outcome and guide despite the uncertain timing and magnitude of iPhone shipments, and the impact of hurricanes on operations.

TT Electronics plc. The company reported that H12017 revenue increased by 13% to £180.0 million (H12016: £159.2 million), or 6% excluding the effects of foreign exchange. On an organic basis, revenue increased by 5%, driven by positive market dynamics and share gains in the Sensors and Specialized Components division and strong market demand in Power Electronics, including some one-off last-time-buy activity as it moves

production from Fullerton in the US to its Bedlington facility in the UK. Revenue in Global Manufacturing Solutions declined by 2% organically, but returned to growth in the second quarter, supported by contract wins in the US. The Group's order momentum continues to be good across all three divisions.

Underlying operating profit increased by 31% to £10.9 million (H12016: £8.3 million) with the improvement largely driven by Sensors and Specialized Components and Power Electronics. Underlying operating profit increased by 11% at constant currency. There was a £1.5 million foreign exchange benefit. At current exchange rates, the company is not expecting any further FX benefit in the second half.

Cash performance was excellent, with cash conversion from continuing operations of 128% (H12016: 63%). The working capital movement for the continuing operations improved to a £2.0 million inflow (H12016: £5.6 million outflow), with the adverse impact of revenue growth on debtors and inventory more than offset by the timing of creditor payments.

The Group's free cash inflow totaled £6.8 million (H12016: outflow £4.9 million). Net debt was £56.0 million as of 30 June 2017 (31 December 2016: £55.4 million). On a pro forma basis, taking account of the proceeds of the disposal of the Transportation Sensing and Control (TS&C) division net of fees, net cash on 30 June 2017 would be approximately £55 million.

Benchmark Electronics, Inc. (NYSE: BHE). The company reported 3Q2017 revenue of \$604 million. Operating margin was 3.4% (non-GAAP 4.1%). The cash conversion cycle improved by 8 days, from 80 on September 30, 2016 to 72 days on September 30, 2017. Cash was \$730 million on September 30, of which \$75 million was available in the US.

Overall revenue increased 5% year over year, driven by continued strong demand in Test & Instrumentation serving the semi-capital equipment market, Computing growth from existing and new customers, Medical growth from new programs, and

Aerospace and Defense (A&D) growth from defense programs. Industrials and Telecommunications growth remained muted year over year from softness among several of its top customers.

The company projects that new program bookings for the third quarter will result in annualized revenue of \$138–\$165 million when fully launched in the next 12–18 months. The new program bookings align with Benchmark's strategic focus on higher value markets.

Fourth quarter 2017 outlook: Revenue between \$590 million and \$610 million. Diluted GAAP earnings per share between \$0.29 and \$0.33. Diluted non-GAAP earnings per share between \$0.34 and \$0.38 (excluding restructuring charges and amortization of intangibles expected at approximately \$0.05 per share).

Company News

Kitron Signs Contract with Kongsberg Maritime

EMS provider **Kitron** has signed a frame agreement with **Kongsberg Maritime** that has a potential value of NOK200 million (€21.22 million) for the next five years.

Kitron will produce and deliver existing and future electronic modules and products to Kongsberg Maritime and actively collaborate on the design, development, industrialization, and production of future products and technology.

“This agreement is strategically important for Kitron. We have long-lasting and close relations with other divisions in Kongsberg. This new partnership with Kongsberg Maritime, the largest business area within Kongsberg, holds significant potential for us,” said Hans Petter Thomassen, Managing Director of Kitron Norway.

Production will take place at multiple Kitron facilities.

Spanish EMS Firm Improves Throughput with Sawyer Robot

Spanish EMS provider **P4Q Electronics** is increasing production throughput by 25 percent by deploying **Rethink Robotics'** Sawyer to test printed circuit boards.

Based in Alonsotegi, P4Q has been seeking to automate more of its factory for many years to improve efficiency and consistency, but traditional caged robots were unappealing due to high costs and employee safety concerns. After purchasing Sawyer, the company deployed the robot in just a few hours and is using and considering the robot for several additional tasks beyond printed circuit board testing. These include inspecting parts, taking pictures for quality assurance, picking and placing, and line loading and unloading.

P4Q plans to assign additional tasks to Sawyer moving forward, with the goal of 100 percent part quality. Additionally, P4Q is hiring additional personnel with the stated goal of finding additional areas to implement collaborative robots and automate the production process even further, Rethink Robotics states in a press release.

Danish EMS Provider GPV Opens New Plant in Mexico

The Danish electronics manufacturer **GPV** has officially inaugurated its new plant in Guadalajara, Mexico. The plant already employs around 80 people and the company expects to reach 350 employees in the coming years.

Bo Lybæk explains that during recent years the company has focused on gaining a footing in the American market, and has been successful in achieving this.

The new 4,500-square-meter electronics plant currently employs about 80 people. But within the next two quarters the company is planning to set up another manufacturing line and expand the workforce further. GPV is in dialogue with local universities regarding talent development.

GPV specializes in the production of advanced mechatronics products and also in developing customized solutions in low and medium volumes with a high degree of flexibility. It can provide both electronic subassembly solutions and finished products (box build).

Kitron Expands Capabilities in the US

Norwegian EMS provider **Kitron** continues to invest in its US presence and its site in Johnstown, Pennsylvania.

The company has recently made new investments to expand its capabilities and to enter the next phase of its US presence. Kitron hosted an event on October 6, 2017 to celebrate the new investments.

Kitron has now invested in a surface-mount technology (SMT) line in Johnstown. With this addition the site has all the capabilities locally to offer complete solutions to customers, spanning PCBA, box build, and high-level assembly.

The company also said that in order to handle the increased business, Kitron will have to hire additional staff in Johnstown.

Foxconn Has Found Its Wisconsin Factory Site

EMS giant **Foxconn** has detailed exactly where the company plans to build its \$10 billion manufacturing complex in the southeastern Wisconsin village of Mount Pleasant.

Mount Pleasant sits about 25 miles south of Milwaukee and has a population of about 26,000 people. The new plant will initially employ 3,000 people, but Foxconn has previously stated that this number could grow up to 13,000, which would make Foxconn a huge employer for the region.

Back in mid-September Governor Scott Walker signed the Wisconsin Valley Special Session Bill (also known as the Foxconn Bill) into law, which paved the way for the EMS

giant's investment by agreeing to nearly \$3 billion in incentives for the company. However, the status of this matter is still undecided, pending a vote by Wisconsin's Economic Development Corp. (see p. 7).

ams Expands Singapore Manufacturing Capacity

Austrian chip manufacturer **ams** is expanding its manufacturing operations in Singapore at the JTC nanoSpace in Tampines.

ams is expecting to invest around \$200 million over the next three years in manufacturing in Tampines. The investment includes a fully automated clean room with filter deposition technology for high-precision micro-optic sensors and a new facility for VCSEL (vertical cavity surface-emitting laser) R&D and sensor manufacturing.

ams's continued expansion in Singapore is the direct result of customer volume requirements for the company's sensor solutions and optical packaging. The new expansion will enable ams to manufacture micro-optic sensors for mobile applications. This new facility complements the capacity at Ang Mo Kio and the company's manufacturing operations in Austria, as well as manufacturing partnerships with major contract manufacturers around the world.

Seamus Grady to Head Fabrinet as CEO

Fabrinet has appointed Seamus Grady as Chief Executive Officer (CEO) and a member of Fabrinet's Board of Directors. Mr. Grady will report to Fabrinet's Board of Directors and, initially, to Tom Mitchell, who has been named Executive Chairman.

Mr. Grady most recently served as Executive Vice President (EVP) and Chief Operating Officer (COO) of the Mechanical Systems Division at **Sanmina Corporation**, where he oversaw 10 facilities in five countries and reported to Sanmina's chief executive officer.

Top 10 Nordic Region EMS Providers

In the run-up to TEC Lund, where **Reed Electronics Research** will present its annual strategic analysis of the European EMS industry, the market analyst has released its provisional ranking of the Top 10 Nordic EMS providers based on global revenues.

The acquisition of **PartnerTech** by **Scanfil** in 2015 created a group with sales of over half a billion euros and operations in six countries on three continents. The company, which has undergone a major restructuring of its manufacturing footprint, including sites in Norway, the UK, and Hungary, is about double the size of the second-place company, **Kitron**. Like **Scanfil**, **Kitron** has established low-cost operations in central and eastern Europe (CEE) and Asia, as well as a site in the US to support customer requirements for local manufacturing.

The Danish EMS **GPV** established a production site in Mexico in 2016 to support its North American customers and is the only other company outside of the top two with a manufacturing presence in that region.

Apart from the Norwegian company **HAPRO**, all of the top 15 Nordic companies have established low-cost manufacturing operations in either CEE or Asia. However, for the majority of companies, production remains in the Nordic region.

Outside of the Nordic-headquartered companies there are only three major players with significant manufacturing operations in the region. The Swiss company **Enics** has sites in Finland and Sweden, and at the beginning of 2017 acquired **PKC Group**'s site in Raahre, Finland but has subsequently closed the plant. The global top-tier company **Sanmina** has three sites, one in Sweden and two in Finland, while the Polish EMS **Fideltronik** established a presence in the region in 2013 through the acquisition of an OEM manufacturing site in Sweden. Based on revenues generated in the region, both **Enics** and **Sanmina** are ranked in the Top 5 EMS providers in 2016.

The top 10 Nordic EMS providers for 2016 are as follows:

1. Scanfil – Finland
2. Kitron – Norway
3. HANZA – Sweden
4. GPV – Denmark
5. NOTE – Sweden
6. Norautron – Norway
7. Orbit One – Sweden
8. Inission – Sweden
9. BB Electronics – Denmark
10. LEAB – Sweden

Salcomp Inaugurates a New Guigang Factory in China

Salcomp is expanding its operations in China and has opened a new factory in Guigang, in the Guangxi autonomous region. Construction of the Guigang factory site started in June 2016. The campus consists of a production plant, warehouse, offices, and dormitories, with more than 85,000 square meters in total.

The annual production capacity of the Guigang plant will gradually reach 350 million units, and as a result, **Salcomp**'s total capacity will increase to over 600 million devices. The Guigang plant will be the biggest single factory of the **Salcomp** Group, providing thousands of new jobs in the region. The factory currently employs around 1,000 people; by the end of 2018, the number of employees is forecast to be around 5,500.

The Guigang facility started production at the end of June 2017. In Guigang, **Salcomp** manufactures adapters and chargers for smart phones and other electronic devices, as well as other wireless charging solutions. The most important market area is China, which accounts for more than 70 percent of the world's smart phone production. Products will also be exported to Malaysia, Vietnam, India, South Korea, Brazil, Mexico, Europe, and the US.

Sanmina Closes Batam Assembly Site

Sanmina SCI has closed its assembly plant in Batam following ongoing worker strikes that disrupted production.

According to the *Jakarta Post*, Batamindo general manager Tjaw Hioeng blamed the move on a "series of rallies and strikes by workers that had harmed the company's reputation."

Sanmina had operated in Indonesia for more than a decade.

Benchmark Settles on Tempe for New HQ

After a six-month, extensive site selection process, global design, engineering, and manufacturing leader **Benchmark Electronics** announced that its new corporate headquarters will be located at Rio 2100, a new 52-acre, Class A office park situated in the heart of Tempe, Arizona.

The company announced relocation plans to Arizona from Angleton, Texas, in April of this year and expects to add approximately 500 new jobs to the greater Phoenix area over the next five years.

Groundbreaking for the new site is expected to begin before the end of the year, with an expected completion date in early 2019. In the interim, **Benchmark**'s headquarters is at 4141 N. Scottsdale Road. The current and new headquarters will house the corporate leadership team and key corporate functions in finance, human resources, legal, marketing, operations, and supply chain. **Benchmark**'s Internet of Things (IoT) and RF and high-speed Design Centers of Innovation will also transition to the new location.

Benchmark's 23 locations span eight countries across the globe. The new corporate headquarters near Sky Harbor International Airport gives the company quick access to customers worldwide.

Sparton Shareholders OK Ultra Deal

Sparton shareholders have approved adoption of a previously announced merger with **Ultra Electronics Holdings**.

The transaction remains subject to certain other customary closing conditions and the parties continue to work toward its completion.

The deal with **Ultra**, which includes its **Ultra Electronics Aneira** subsidiary, was announced on July 7.

Foxconn to Build Training Centers in India

A **Foxconn** subsidiary plans to set up three regional training centers in India in the coming years, according to local

media reports.

Josh Foulger, managing director of Foxconn India, reportedly told the state finance minister that the company, the world's largest EMS/ODM, will set up the sites in the district of East Godavari. Finance Minister Yanamala Ramakrishnu reportedly suggested putting the centers in Peddapuram, Tuni, and Amalapuram.

Up to 400 prospective workers could be trained at these centers each month, the reports indicated.

Google and HTC Enter a \$1.1 Billion Cooperation Agreement

Google and HTC Corporation have entered into a definitive agreement under which certain HTC employees—many of whom are already working with Google to develop Pixel smart phones—will join Google.

HTC will receive \$1.1 billion in cash from Google as part of the transaction. Separately, Google will receive a non-exclusive license for HTC intellectual property.

In a press release, HTC says that the agreement also supports the company's continued branded smart phone strategy, and will enable a more streamlined product portfolio. HTC will continue to have engineering talent, which is currently working on the next flagship phone, following the launch of the HTC U11 earlier this year.

For Google, this agreement further reinforces its commitment to smart phones and overall investment in its emerging hardware business. In addition to the experienced team of professionals, Google will continue to have access to HTC's IP to support the Pixel smart phone family. Additionally, this agreement also represents a significant investment by Google in Taiwan as a key innovation and technology hub.

PC Vendors Eyeing Medical Care Market

PC brand vendors including Hewlett-Packard (HP) and Dell have shown interest in entering the medical care device market and are partnering with

their component suppliers to design related products, according to sources from the upstream supply chain.

In the past, HP and Dell would cooperate with medical care device vendors to supply customized systems and monitors for them to sell to hospitals or clinics; now, however, the PC vendors are planning to skip the intermediaries and form direct partnerships with medical care service providers.

The sources pointed out that orders for medical care devices started growing significantly in 2017 and they expect the increase to continue into 2018.

Research firm BMI Research has figures showing that the worldwide medical care device market had a scale of US\$323.9 billion in 2015 and will grow to US\$382.5 billion by 2018 at a CAGR of 5.7% from 2015 to 2018.

In addition to brand vendors, ODMs such as Quanta Computer, Compal Electronics, Wistron, and Inventec are aggressively trying to grab a slice of the pie. Since most of the new equipment requires support for cloud computing and big-data analysis, related demand is expected to give these PC makers some advantages against traditional medical care device suppliers.

Upstream Suppliers to Enjoy Rising Revenues from AirPods and Apple Watches in 4Q17

Quanta Computer and Inventec, as well as the ASE group's Universal Scientific Industrial (USI) and the Foxconn group's Shunsin Technology and Luxshare-ICT, are expected to see strong growth for their wearable product operations in the fourth quarter, thanks to rising sales for Apple's AirPods and Watches, according to sources from the upstream supply chain.

With the Apple Watch series 3's support for LTE connection and phone functionality, and the introduction of the AirPods, demand for the smart watches has been picking up recently.

Quanta and USI have been long-term supply-chain partners of the Apple Watch series and are expected to see a significant revenue contribution from

the orders, while Shunsin has just recently joined the supply chain to provide SiP services and will begin processing related orders in February or March 2018, the sources noted.

As for the AirPods, the sources pointed out that shortages have already eased and Apple has also increased its orders for the device.

Inventec is the manufacturer of the AirPods, while the device's communication module is supplied by Luxshare-ICT. In addition to the AirPods orders, Luxshare-ICT also supplies connectors, cables, and antennas for Mac and iPhone products, according to *DigiTimes*.

Lite-On Technology Expands in China

EMS provider Lite-On Technology will invest US\$45 million to establish an automotive electronics subsidiary in Suzhou and US\$35 million in another subsidiary for storage devices and components in Changzhou.

The subsidiaries, Suzhou Lite-On Technology and Lite-On Automotive Electronics (Changzhou), are both in eastern China.

Lite-On will also spend up to NT\$1.15 billion (US\$38.1 million) to add automation equipment at its existing subsidiary, Lite-On Electronics (Guangzhou), in southern China.

The Suzhou plant will produce SSDs (solid-state drives) mainly for notebooks and cloud computing devices, while the Changzhou maker will mainly produce automotive electronics and LED lighting modules.

The Guangzhou subsidiary produces smart phone CCMs (compact camera modules) and the additional automation equipment will be used mainly to produce large/wide-angle and 3D-sensing models, as reported by *DigiTimes*.

Insight Equity Acquires Virtex Enterprises

An affiliate of Insight Equity Holdings, LLC (Insight Equity), the Southlake, Texas-headquartered private equity firm, announced the

acquisition of **VirTex Enterprises** (VirTex), a vertically integrated electronic manufacturing services provider. The company has over 165,000 square feet of manufacturing space, giving it the ability to produce both complex electronic components and complete systems for customer platforms at volumes ranging from prototyping to full-scale production.

VirTex combines the sophisticated processes and manufacturing capabilities of a large-scale electronic manufacturing services provider with the attention and customization of a local partner. The company has advanced manufacturing and assembly capabilities, broad end-market diversification, and a deeply experienced management team that is focused on providing the highest quality of service to its customers. “We are excited to partner with the VirTex management team to continue to grow the company and further expand its manufacturing capabilities,” remarked Luke Bateman, a vice president at Insight Equity.

Foxconn Starts Shipping iPhone X

EMS giant **Foxconn** has reportedly started shipping iPhone X devices. However, the first batches are smaller than expected.

Foxconn has shipped the first batch of 46,500 units from Zhengzhou and Shanghai, heading for the Netherlands and United Arab Emirates, respectively, reports *DigiTimes*, citing the Chinese-language *Xinhuanet*.

Apple will start to take presales orders on the iPhone X on October 27 and has said it would start delivering the devices on November 3. However, the paucity of the first batch would suggest that the new X model might be one of the more “hard to get” smart phones on the market these days.

Foxconn has now ramped up its output of the new iPhone product from 100,000 units on a weekly basis to 400,000, the report continues. The question now is if this increase will be enough to meet market demand.

Sparton and Ultra Electronics USSI JV Awarded New Contracts

Sparton Corporation and **Ultra Electronics USSI**, a subsidiary of **Ultra Electronics**, have been awarded subcontracts valued at \$12.9 million from their **ERAPSCO/SonobuoyTech Systems** joint venture.

ERAPSCO/SonobuoyTech Systems will provide manufacturing subcontracts in the amount of \$5.7 million to Ultra Electronics USSI and \$7.2 million to Sparton De Leon Springs, LLC. Production will take place at Ultra Electronics USSI’s Columbia City, Indiana facility and Sparton’s De Leon Springs, Florida facility.

ERAPSCO/SonobuoyTech Systems was awarded multiple foreign contracts for the manufacture of passive and active sonobuoys in support of multiple underwater missions for detection, classification, and localization of adversary submarines during peacetime and combat operations.

Wisconsin Redoing Terms of Foxconn Deal

A key Wisconsin agency is delaying a vote on a \$3 billion incentive package for **Foxconn** over concerns about how the deal is worded.

The vote by the Wisconsin Economic Development Corp. is now expected to take place no earlier than November. The public-private agency, created by an act of the state legislature in 2011, serves as the state’s department of commerce.

A state legislator compared some of the terms of the deal with the world’s largest EMS/ODM to a “nuclear bomb” and is insisting on changes.

The state is negotiating the package in order to attract a new LCD manufacturing campus. It is expected that the deal will still pass, reports *Circuits Assembly*.

China IIoT Market to See 20% CAGR in Next Four Years

With the advent of the Industry 4.0 era, China is aggressively gearing up for the development of IIoT (Industrial Internet of Things) applications to accelerate industrial upgrades and transformations. It is estimated that China’s domestic IIoT market will experience a CAGR of 20% from 2018 to 2021, according to a report issued by the China-based *Qianzhan Industry Research Institute*.

The report cited declining labor productivity, thinning demographic dividend, and escalating production costs as the major factors driving Chinese authorities to step up their promotion of industrial upgrades and transformations. The government has come up with a spate of policies associated with its “Made in China 2025” program to effectively fuel innovative development of industries in the country.

IIoT is one of the major segments of IoT applications, with manufacturing, warehousing, and logistics operations having to rely heavily on the IIoT advantages of collecting and analyzing the data concerning operation lines and equipment to satisfy their tracking, forecasting, and prewarning needs, according to the report.

Meanwhile, statistics compiled by China-based *CCID Consulting* showed that, driven by policy support and strong market demand, China’s IIoT market scale is estimated to reach CNY450 billion (US\$68 billion) by the end of 2020. It said the key to China’s booming development of IIoT applications and the rapidly expanding market scale rests with robust development of software platforms in the country.

To explore the huge market potential, international industrial heavyweights have rushed to set up relevant operating platforms in China. Germany’s **Siemens**, for instance, launched its Mindsphere platform in 2016; this is an open, cloud-based operating system allowing users

to connect their machines or physical infrastructure to the digital world. In March 2017, US-based **General Electric** (GE) also teamed up with **China Telecom** to debut an IIoT software platform dubbed Predix, aimed at building an open industrial Internet ecosystem and offering corporate application solutions to drive the digital transformation of China's industrial manufacturing.

In April this year, China-based **Haier Group** also released its Cloud of Smart Manufacturing Operations Platform (COSMO Plat) to integrate the resources of users and developers of manufacturing equipment to facilitate smart manufacturing.

Celestica Appoints New Chief Financial Officer

EMS provider **Celestica** has appointed Mandeep Chawla as the company's Chief Financial Officer, effective immediately.

Mr. Chawla has been Celestica's interim CFO since June and was appointed following a search process that included both external and internal candidates. Since joining Celestica in 2010, Mr. Chawla has held progressively senior roles in the organization, most recently as Senior Vice President, Finance. Prior to joining Celestica, he held finance positions with **MDS, Inc.**, **Tyco International**, and **General Electric**.

Intel Collaborates with Flex on Health Application Platform

Intel has recently launched its Health Application Platform (HAP), an application software platform that can be used by remote care solution providers to enable a variety of remote healthcare usage models.

Remote patient care encompasses a variety of care modalities that are provided to a patient outside of a clinical setting. The advent of the Internet of Things (IoT) has been a huge boon to the healthcare industry.

To make the Intel HAP platform readily available to solution providers, Intel has collaborated with manufacturing solutions provider **Flex**.

Flex collaborated with Intel to create an IoT computing engine offering a connected device that provides wireless connectivity to verified peripherals like blood pressure and glucose monitors, pulse oximeters, weight scales, and more. This solution aims to enable healthcare solution providers to bring transformative remote care solutions to market.

Comintel to Sell BCM Electronics for RM123.8M

Comintel Corp Bhd is selling its electronic manufacturing services unit **BCM Electronics Corp Sdn Bhd** for RM123.8 million, to a company partly owned by its executive director Loh Hock Chiang.

Comintel, in its filing to Bursa Malaysia, said BCM Electronics provides turnkey manufacturing services and this planned sale gives it an opportunity to unlock and realize the value of its investment in the unit.

Publisher: Randall Sherman

Editor: Anna Reynolds

Research Analyst: Vivek Sharma

Board of Advisors: Michael Thompson, CEO, I. Technical Services; Ron Keith, CEO, Riverwood Solutions; Andy Leung, CEO, VTech Holdings, Ltd.

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E-mail: rsherman@mfgmkt.com

Website: www.newventureresearch.com

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