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Developments in Advanced Packaging Lead to a New Generation of Suppliers

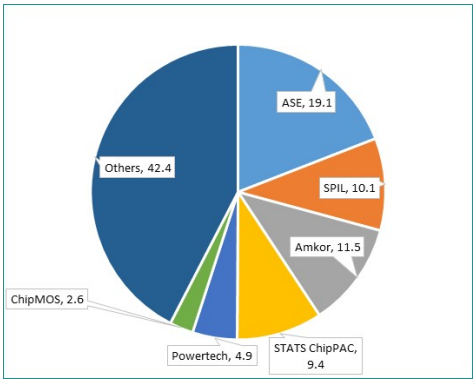
As the Internet of Things (IoT) becomes increasingly common, there is an emerging trend in favor of "module manufacturing," which includes IC packaging and compound semiconductor assembly. The recent success of system-in-package (SiP) and multichip module (MCM) solutions is leading top-tier EMS and ODM companies to explore alliances with IC packaging and optoelectronics firms. The logic behind this is clear: IC packaging firms have operating margins more than double those of EMS firms—averaging around 18% to 20%—whereas EMS firms have gross margins of only 2% to 10%. Foundry chip companies that are farther up the supply chain maintain gross margins of 40% to 50%, and may offer attractive opportunities for outsourced semiconductor assembly and test (OSAT) and EMS providers to improve earnings. How far up the supply chain these companies will go remains to be seen, but *MMI* has observed that there is currently quite a bit of activity going on in this space.

EMS companies like **Foxconn, Pegatron, Flex, Jabil**, and **Wistron** all have active programs in SiP, but many more ODMs—such as **ASUSTek, Byde, Compal, Delta, Inventec, Qisda, TPV**, and others—have jumped on the SiP train, where OSATs have traditionally been the dominant players. The question that these companies are asking is, can these new hybrid or mixed-model companies contribute to faster time to market and lower costs by creating miniature SiP modules under one operation instead of three separate ones, as is currently done? While the higher gross margins are clearly the leading attraction, also important is the need for miniaturization and lower cost, all of which is made possible by this new and so-called "integrated" manufacturing model.

There is evidence that IC packaging and PCB assembly manufacturing equipment are already converging, partly due to alliances between equipment suppliers such as **ASMP** and **Siemens, K&S** and **Assembléon**, as well as others, who see this as an opportunity to streamline the supply chain and concurrently capture higher margins.

Perhaps the best example is Foxconn's acquisition of **ShunSin**, a SiP module manufacturer of RF power amplifiers, LNA and MEMS products, and other optical transceivers and solar photovoltaic concentrator modules. In 2014, SiP accounted for 85–90% of its revenue; **Apple** is its main end customer. Other customers include **Avago, Qorvo** (formerly **TriQuint), Skyworks**, and **RFMD**.

OSAT Worldwide Market Share (%), 2015



Source: NVR

Then there is ASUSTeK and **AzureWave**—a wireless module provider under ASUS Group that produces wireless communication and digital image processing–related module products. Main customers include ASUSTeK, Pegatron, **Google**, and **Xiaomi**. AzureWave became the supplier of the 3x3 MIMO Wi-Fi module card for Apple's iMac and Mac Pro in 2015. Additionally, the market expects it to supply Wi-Fi SiP modules for iPhones and iPads sometime in 2016.

Jabil is active in the SiP module business, as evidenced by its acquisition of **AOC Technologies** in optical networking modules, and other internal investments in RF modules

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and in semiconductor photonics. In an interview, Vice President of Strategic Capabilities/Engineering & Technology Services Dan Gamota remarked that "it (EMS and IC packaging) is an area that we are actively observing and have been watching for quite a while. Miniaturization is creating opportunities in different domains such as communications and networking, optics and cameras, automotive, consumer lifestyle products, wearables, aerospace, and healthcare, which are all benefiting from miniaturization and module integration. In some cases, we develop the capabilities in-house and in other situations we are better served through M/A activities." In 2015, Jabil also expanded its diversified integration capabilities by acquiring **Clothing Plus**, a Finland-based textile electronics pioneer, and **Kasalis**, a leading active alignment provider for camera and gesture-recognition modules.

More than any other company, Foxconn seems to be taking the lead in this mixed business model in its recent bid to acquire **Siliconware Precision Industries (SPIL)**, which has also been pursued for the last year by **Advanced Semiconductor Engineering (ASE)**. ASE Group owns **Universal Scientific Instrumentation (USI)**, a global EMS company with 2015 revenue of nearly $3 billion and a leading technology manufacturer of wireless modules for mobile devices. USI has claimed that it had 10–15% global market share in a Wi-Fi SiP module (Wi-Fi + Bluetooth + FM) in 2012, and 50% allocation from Apple (**Lenovo** is another key customer). If Foxconn is successful in its bid over ASE to acquire SPIL, it will be positioned to be one of the leading suppliers of both EMS and IC module packaging services. Foxconn clearly wants control and domination of the revenue real estate that comes from IC packaging services.

But what other players are involved in this space? There are many, and at this moment it is a bit of a free-for-all in regard to M/A activities. For example, there is Pegatron and **Kinsus**, a major substrate supplier with high exposure to communication IC (FC-CSP, WB-CSP, SiP) markets, with major customers that include **Qualcomm, Broadcom, Altera, Xilinx**, and **MediaTek**. There is **Quanta** and **QMI**, a company that designs and manufactures SiP modules for handheld devices, PCI-E modules for PCNB, mini-PCI modules for embedded applications, and USB dongles (the company also offers highly integrated solutions with Wi-Fi, Bluetooth, GPS, and DVB-H functions in a single module). There is also Compal and **Arcadyan**, which provides broadband access, multimedia and wireless technology, and wireless equipment and devices to telecom operators and consumer electronics vendors and retailers (major products include broadband [AD, IP-STB, and LTE, 60–65% of sales] and AP/gateway and Wi-Fi modules). Finally, there is Wistron and **Wistron NeWeb (WNC)**, which designs and manufactures wireless connectivity products (major product lines include smart home, automotive, and mobile communication).

So who will assemble these SiPs? Currently, the leading suppliers are the OSAT companies, of which ASE is the market leader (see chart showing OSAT market share, page 1). These contract manufacturers are familiar with design tools for modules/packages, including electrical and thermal modeling and antenna design, and have a history of obtaining die from many sources. Moreover, they have capabilities in fine-pitch wire bond or flip chip die bonding, and in providing required EMI shielding and package test capability. On the other hand, EMS suppliers have good ability to purchase and manage materials through the supply chain, can provide components from multiple sources, and have high-throughput SMT machines capable of die and passive device placement. There is no reason why, in the module process capability, EMS companies could not do embedded die and SiP assemblies.

Vertical integration has been a consistent industry trend over the last decade. As mentioned, there is a major battle raging between ASE and Foxconn over the assets of SPIL, not just to cannibalize existing customer relationships, but also to prepare the industry for a solid volume ramp-up. SPIL has been evaluating various vertical cooperation opportunities since 2010 and ASE has been exploring growth potential, focusing on its EMS and testing and packaging capability. Likewise, Foxconn has been developing additional upstream semiconductor capabilities with its acquisition of and investments in **Fitipower** (IC design house for PMIC and LCD driver ICs), **Fiti** (semiconductor and TFT-LCD equipment), and **Socle Technology** (system-on-chip [SoC] design and implementation services). Also, just this month, the company has expanded its semiconductor focus in partnership with **ARM Holdings** to serve Apple and Foxconn's subsidiary **Ennoconn** becoming the major shareholder in **S&T AG,** which is taking a 30% stake in German **Kontron AG**. Before adopting SiP, the key EMS process was to mount components on PCBs through surface-mount technology. With these strategic alliances, the benefit for Foxconn clearly is the potential synergy with SiP development, including that for the Apple Watch.

Foxconn claims that the TAM for the SiP/module business reached about $25B in 2015 (10.5B units), five times bigger than ASE's SiP/EMS revenue forecast, which equaled 18% of Foxconn's 2015 revenue. This market is expected to grow to $40B in 2018 (15B units), signifying a 17% CAGR. SPIL and Foxconn could well become the number-one player in terms of market share.

Five specific SiP areas appear to be of interest: 1) fingerprint (FP) modules, 2) camera modules, 3) RF PA modules, 4) MEMS modules, and 5) LNA/ASM modules for antenna switches. Other growing application areas include IoT and wearables.

The OSAT + EMS strategy is a good one used by ASE to mitigate rising competition within the pure OSAT industry, especially in China, where **JCET** last year acquired **STATS ChipPAC**. The potential team-up between SPIL and Foxconn would jeopardize this strategy by creating an OSAT + EMS powerhouse that would compete head-on against ASE, which could bode ill for this OSAT leader and other pure OSAT players in the long run.

Foxconn's strategy would enhance its competitive edge in the EMS space and benefit from the rising trends of miniaturization and modules in the mobile devices industry by leveraging SPIL's capabilities in advanced

packaging. Meanwhile, ShunSin Technology, which specializes in SiP products and in which Foxconn holds a 60.7% stake, could also benefit from this cooperation in the long term. Finally, Ennoconn, S&T AG, and Kontron AG can forge a close working relationship in the Internet of Things/Industry 4.0 sector.

A key downside risk for Foxconn includes potential losses of iPhone order share to aggressive competitors. Foxconn's share of iPhone assembly orders is gradually eroding from 70%+ to 60–65%, and may stabilize in the 55% range. While it is tough to replicate Foxconn's size (1.2 million people on iPhone projects), its competitors are aggressive. Pegatron (100,000 people on iPhone projects) proves this point, as it is catching up. Meanwhile, Chinese conglomerates are forming around an emerging semiconductor industry that might threaten Foxconn's dominance. The OEMs, IDMs, OSATs, and EMS/ODM players are already lining up.

New Venture Research is preparing a special syndicated report on the emerging market for EMS and OSAT assembly, to be published in early 2017. Mr. Frank Klomp, an independent senior industry analyst with NVR and former Assembléon employee, is the author. Please contact us for further information.

Some Quarterly Results

Jabil Circuit (JBL). Jabil reported 4Q2016 sales of $4.4B and EPS of $0.28. Operating margins of 2.4% declined 110 bps y-o-y. F1Q17 guidance was for sales of $4.8–5.0B and EPS of $0.54–$0.74.

On the positive side, sales in Electronics Manufacturing (EM) and Diversified Manufacturing (DM) modestly beat expectations on solid execution. Jabil's **Apple**-related business in F4Q16 appeared to have been on track with management's revised expectations from last quarter, and did not worsen, although guidance implies expectations have not significantly improved in F1Q17. Jabil continues to see stability in the EM segment and sees 5–6% profit growth in this segment in FY17, with margins expected to improve to 3.4–3.5%, suggesting EM sales growth in the range of 2–5% y-o-y. On the negative side, management announced a $195M two-year restructuring plan to lower SG&A spending and realign capacity. In addition, sales are expected to decline 6% y-o-y in F1Q17 on flat EM sales and a 12% y-o-y decline in DM. The lack of visibility in the DM segment is making it difficult for Jabil to provide a FY17 outlook.

Jabil is doing a good job of executing in a challenging demand environment, as shown by its modest outperformance. However, the company's need to restructure the business and lack of ability to provide full-year guidance highlight the significant uncertainty created by Jabil's exposure to Apple (24% of sales).

Sparton Corporation (SPA). Sparton reported 4Q2016 adjusted EPS of $0.51 and sales of $107.0 million. The company had given Q4 guidance of $100–104 million in sales and a gross profit margin of 18.0–19.0%. Its actual gross profit margin was 20.0%.

Manufacturing & Design Services (MDS) net sales were $68.7 million, compared to $64.7 million in the third period. Engineered Components & Products (ECP) net sales were $38.2 million, compared to $37.5 million in the third period. For MDS, the gross margin on net sales was 14.2%, compared to 12.0% in the third fiscal quarter, and the ECP segment had a gross margin on net sales of 30.6%, compared to 30.1% in the third period. After the third period, management had indicated it expected fourth-quarter segment margins to be similar to the third period.

In the quarter, SG&A was $13.5 million, or 12.6% of consolidated net sales. It was $12.4 million, or 11.6% on an adjusted basis. The adjusted operating income was $5.9 million, or 5.5% of adjusted operating margin. Sparton recognized an impairment of goodwill in the MDS segment of $64.2 million related to the underperformance of its **Hunter Technology** acquisition and its inability to achieve sufficient organic revenue growth to offset the loss of a large customer, as well as revenue declines due to fluctuation in customer demand across the segment. The reported loss per share was $4.30. Adjusted EBITDA was $10.0 million, which was an adjusted 9.4% EBITDA margin. Free cash flow in the quarter was $26.0 million. Borrowing under the credit facility was reduced by $26.2 million and now stands at $97.2 million.

In the quarter, the company had 66 new program wins in the MDS segment, with expected annual revenue of $15 million when fully ramped up and in production. In the year, it had $61 million in expected annual revenue from program wins in the MDS segment. It received a $54 million award for the production of domestic sonobuoys and $11 million in awards for the production of foreign sonobuoys.

In the fourth fiscal quarter, management announced the exploration of a potential sale of Sparton and amended its credit facility to provide flexibility. The facility was reduced from $275 million to $175 million. At the end of the year, Sparton had a backlog of $138 million in the MDS segment and $142 million in the ECP segment, including $117 million in domestic sonobuoys, $6 million in foreign sonobuoys, and $14 million in ruggedized displays.

While Sparton continues the strategy of seeking a buyer for the whole company, it has postponed actively seeking a new CEO. Joseph J. Hartnett, Interim President & CEO, has said he will remain in that position until the board decides otherwise.

Management noted that the fourth quarter had been active, with the ongoing exploration of a potential sale of the company in addition to continuing to implement operational and financial improvements. The sales pipeline and new program wins continue to demonstrate traction as they focus on organic growth. Management is building a foundation that will support profitable revenue growth through new business development and improved operating performance.

Company News

New Life for Former TT Electronics Factory

Glenrothes, UK–based **CN Properties** has acquired a considerable part of **TT Electronics**'s disused factory and site in Eastfield, Glenrothes, for a £2 million investment in business units. The facility has been standing empty and obsolete since TT closed up shop about seven years ago, according to *The Courier*.

New owner CN Properties is planning to divide the original building into eight smaller units and is also considering further development of an additional 15 new build units.

When TT Electronics shut down operations at its Eastfield site, the company transferred the work to a company in Northumberland due to declining manufacturing activity, the report continues.

Huawei and Flex to Start Making Phones in India

Huawei is gearing up to start producing phones in India by the end of this month. While the phones might say Huawei, they will be made by EMS provider **Flex**.

The phones will be produced at Flex's assembly facility near Chennai, where the EMS provider already makes smart phones for both **Lenovo** and **Motorola**, according to a report in *The Economic Times*.

According to one of the paper's sources, Huawei may start with a capacity of 200,000 units per month, but would also be able to scale up, as the facility would have enough capacity to take more orders.

Avnet to Sell Technology Solutions Business to Tech Data for $2.6 Billion

Avnet has entered into an agreement to sell its Technology Solutions operating group to **Tech Data** in a stock and cash transaction valued at approximately US$ 2.6 billion.

Under the terms of the agreement, Avnet will receive US$2.4 billion in cash and 2.8 million shares of Tech Data common stock, currently valued at approximately US$200 million.

The acquisition of Technology Solutions by Tech Data presents Avnet with the best strategic path for its future success and profitability, and puts Technology Solutions in a position to achieve breakthrough business results with Tech Data.

Executive changes… The UK's **Stadium Group** is expanding its wireless engineering team at the company's Regional Design Centre (RDC) in Kista Science City, Stockholm, which opened earlier this year. The new appointments add over two decades of mechanical design experience to the team, further strengthening the company's high-caliber wireless connectivity and RF engineering capabilities. Dr. Peter Lindberg joins the company as its new Senior Hardware Engineer. Peter has over 16 years' experience in the wireless research and design sector. Previous roles include Senior Hardware Engineer at **ABB**, Firmware Engineer at **TE Connectivity**, and Staff Engineer, Advanced Technologies Group at **Laird Technologies**. Fredrik Palm will become the team's Senior Mechanical Engineer. He brings with him 22 years' technical experience from the telecom sector. His previous roles include Mechanical Designer at **Piab AB**, Senior Mechanical Design Engineer at Laird Technologies, and Mechanical Designer at both **Centurion, Ltd.** and **Allgon Mobile Communications AB**.... Oliver Seifert has been appointed Managing Director for **BuS Holding GmbH** and **BuS Elektronik GmbH & Co. KG**, effective September 1, 2016. His responsibilities also include the running of the Děčín (CZ) facility.

Oliver Seifert follows Alois Fuchs, who served as interim CEO since the sudden death of Dr. Werner Witte in November 2015 and who has now retired. For eleven years, Seifert held senior positions at Motorola, overseeing the establishment of logistics and service centers. Later, he held management positions with technology leaders such as the medical device manufacturer **Otto Bock** (Vice President, Manufacturing and Service) and the HVAC specialist **TROX** (Chief Technology Officer)…. EMS provider **AWS Electronics Group** has appointed Petra Jani as Plant Director of AWS Slovakia, effective immediately. Jani assumes full executive responsibility for the Námestovo, Slovakia site, which provides AWS Electronics's customers with low-cost, high-quality volume contract manufacturing facilities and mirrors those available at AWS Electronics's UK plant. Jani has extensive experience in manufacturing and joins AWS from her previous position with the Korean Automotive supplier **PHA**, where she was Managing Director of its Slovakia factory. Previously, she held senior management positions including Head of Operations, Head of Production, Head of Engineering, and Head of Maintenance at a number of companies in Europe.… **TE Connectivity's** Board of Directors has appointed Terrence Curtin to succeed Tom Lynch as the company's chief executive officer, effective March 9, 2017. Curtin was previously elected to TE Connectivity's (TE) Board of Directors at the company's annual general meeting held on March 2, 2016 and is currently TE's president. Lynch has served as the company's Chief Executive Officer since January 2006. He led the transition of TE Connectivity from a former electronics segment of Tyco International to a separate and independent public company. Lynch will serve as the company's CEO until the transition to Curtin on March 9, 2017. Upon transition, Lynch will continue as Executive Chairman of the Board.

Fabrinet Acquires UK's Exception EMS

Thailand-based EMS provider **Fabrinet** is entering the European EMS market, and is doing so through the acquisition of **Exception Global CEM Solutions, Ltd.** (otherwise known as Exception EMS).

With its base in Wiltshire, United

Kingdom, Exception EMS has been providing contract electronics manufacturing services since 2015. The company's customers include industrial, energy, aerospace, and defense companies. Approximately 80% of Exception's revenue is derived from customers in Europe.

With this acquisition, Fabrinet is establishing a strong foothold in Europe, which will allow it to grow its business with European customers, and give them access to its advanced low-cost manufacturing services in Thailand, particularly in its new facility in Chonburi that will be coming online in the next several months.

Going forward, as NPI projects in Fabrinet West and Exceptions EMS transition to volume manufacturing, these intracompany relationships will facilitate the transfer of the volume manufacturing to Fabrinet's Thailand facilities.

Total consideration for the transaction was approximately $13.5 million in cash. Fabrinet anticipates that the transaction will have an immaterial impact on revenue and net income in the first quarter of fiscal 2017.

New facilities… **Samsung SDI** decided that Hungary will be its European base for the production of batteries and launched the construction of a new plant. The new facility in Hungary will enable Samsung SDI to establish a triangular production structure along with existing plants in Ulsan, Korea and Xian, China. Aiming to start commercial production in the second half of 2018, the company will set up production lines with annual capacity of 50,000 pure electric vehicle batteries, investing around KRW400 billion (€315.44 million). The new battery plant will be built in the city of Göd—about 25 kilometers north of Budapest—on a site area of about 330,000 square meters and also utilizing existing facilities previously used for display production. By establishing manufacturing in Hungary, the South Korean company aims to reduce logistic costs while enabling faster response to customer demand, as the production bases of European automotive manufacturers are concentrated in central and eastern Europe. According to the Hungarian government, some 600 new jobs will be created within the framework of the project.

Acquisitions… **Integrated Micro-Electronics Inc. (IMI)** has signed a definitive agreement under which IMI will acquire a 76% stake in **VIA optronics GmbH**, an optical bonding and display solutions provider, for €47.4 million. VIA founder Jürgen Eichner will retain 24% ownership and continue to lead VIA as Managing Director, reporting to Arthur R. Tan, IMI's chief executive officer. The acquisition is expected to be accretive to IMI's earnings per share starting in 2017. The transaction was expected to close in the third quarter of 2016. Alpina Partners is selling all of its 55% shareholding as part of the transaction. Alpina Partners has been a shareholder in VIA since June 2010. Together, IMI and VIA believe the acquisition will allow IMI to strengthen its partnerships with customers by offering complementary automotive camera and display monitor solutions for advanced driver assistance systems.… **OSI Systems** has completed its acquisition of **American Science and Engineering, Inc. (AS&E)**, a provider of detection solutions for advanced cargo, parcel, and personnel inspection. OSI Systems acquired all issued and outstanding shares of AS&E for US$37.00 per share in cash and assumed certain unvested AS&E equity awards for a total purchase price of approximately US$269 million. With this acquisition, OSI Systems' security offerings now include additional inspection systems based on x-ray backscatter technology, including the Z Backscatter Van (ZBV) and the MINI Z portable backscatter-based inspection system.… **Zentech Manufacturing** announced the acquisition of an electronics design engineering company, extending the EMS company's reach into front-end services. Charleston, SC-based **Interconnect Design Solutions** founder Mike Brown will remain with Zentech as vice president of engineering services. Additional details about the transaction were not disclosed, as reported by *Circuits Assembly*.… Connectivity and sensors company **TE Connectivity** has completed the acquisition of the **Intercontec Group**. TE is now starting the integration process and has appointed a new general manager, Peter Van Loo, formerly the general manager of TE's Industrial Rail business, to manage the transition. Intercontec is a manufacturer of circular metric connectors. The company's headquarters are in Niederwinkling, Germany and it has four production plants in the country. With the acquisition, TE is strengthening its role as a full-solution provider, particularly for factory automation and machinery customers. TE will broaden its rugged connectivity portfolio, especially in industrial power and signal connectors, with the addition of Intercontec's complementary circular metric connectors alongside TE's own circular and rectangular heavy-duty connectors.

Samsung Selling Printing Business Unit to HP

Samsung Electronics has reached an agreement to sell the entire global operations and assets of its printing business to **HP**. This transaction is part of a move to concentrate on its core business areas.

Samsung will spin off the printing business unit into a separate company as of November 1 upon the approval of shareholders, and sell a 100% stake of the newly created company and overseas assets related to the business to HP. The US company will acquire the Samsung business unit for $1.05 billion.

Under the agreement, Samsung will source printers from HP and continue to market in Korea under the Samsung brand. The transaction is expected to close within one year, subject to the appropriate regulatory approvals.

The printing business, with 6,000 employees, a production base in China, and more than 50 sales offices globally, posted KEW2 trillion (€1.6 billion) in revenue in 2015.

New orders… **Kitron** has received orders for **Aidon** RF communication modules with a value for Kitron of more than NOK100 million (€10.87 million). The orders will be fulfilled during the next three years and increase the current business scope with Aidon. Production will take place at Kitron's plant in Kaunas, Lithuania.

Aidon's open architecture–based smart metering systems and new-generation Energy Service Devices serve more than 1.5 million metering points.

Scanfil to Discuss Possible Vantaa Plant Closing

Scanfil Oyj has entered mandatory negotiations to restructure its contract electronics assembly operations in Vantaa, Finland.

The EMS company indicated that the possibility it would shutter the factory would be discussed during the negotiations.

The potential restructuring concerns all personnel at the Vantaa site. Scanfil acquired the factory as part of its purchase of **PartnerTech** in July 2015.

Scanfil has already commenced factory shutdowns at its plants in Dongguan, China, and Cambridge, UK this year, as reported by *Circuits Assembly*.

Norautron Expands Further in China

In August, Norwegian EMS provider **Norautron** moved into its third building in Suzhou, China, as more space was required to grow the business.

The new building is 3,600 square meters. "With more new products introduced, more space was required for both manufacturing and administration," says Kenny Liu, Business Development Manager. "For manufacturing, additional capacity will be introduced for SMT-line and testing purposes."

In addition, the administration will have more functional facilities: The company will add a 160-square-meter showroom dedicated to displaying its products and services to customers.

Kongsberg Sells Its Stake in Kitron

Norwegian **Kongsberg Gruppen ASA** has sold its stake in EMS provider **Kitron**. Kongsberg sold its 33.4 million shares representing 19.33% of the shares in Kitron. The company sold its stake at a price of NOK5.50 per share (a total value of NOK183.7 million, or €20.49 million). Following completion of the sale, Kongsberg Gruppen ASA will not hold any shares in Kitron ASA.

Apple Sets Up First R&D Center in China

Apple has set up its first R&D center in China in Beijing's Zhongguancun Science Park, according to a statement issued by the Zhongguancun Park Management Committee.

The R&D center has registered capital of CNY100 million (US$14.994 million), with total investment likely to reach CNY300 million in the future. The center plans to hire a total of 500 employees, focusing on the development of computer software and hardware products, communication, and audio and video devices, as well as advanced technologies for consumer electronics products and the information industry.

The R&D center is expected to be complete in 2016 and to be used to integrate Apple's engineering and business teams for ramping up sales and services, according to media reports in China.

Apple has set up R&D centers in Japan, Israel, and the UK, and plans to establish similar facilities in Canada, India, Indonesia, and Vietnam to optimize local resources, as reported by *DigiTimes*.

BlackBerry No Longer Building Phones; Switches to OEM Model

BlackBerry has confirmed it will no longer be building its phones in-house and will instead leverage third-party OEMs.

BlackBerry CEO John Chen has confirmed that his company will no longer be building its own phones going forward. All new BlackBerry phones will be built by OEMs, likely in a bid to save some cash and lessen the risk associated with releasing a new phone.

According to what BlackBerry has confirmed, the company will build handsets with "partners" and these handsets will be branded as BlackBerry handsets. This new process, according to Chen, allows BlackBerry to focus on the software and security side of things.

BlackBerry is working with **Samsung** on various projects and it will be interesting to see if the noted design becomes official and if Samsung will be one of BlackBerry's hardware partners in the future, notes *Patently Apple*.

Facilities expansion… **UKC Holdings**, a Japanese trading house specializing in semiconductor devices, plans to ramp operations up to full tilt at a new electronics manufacturing services plant in Vietnam by the end of 2017. UKC is spending about ¥1.5 billion ($15 million) on the plant, which is involved in manufacturing key components on behalf of smart phone makers. The company hopes to expand the plant's operations to include contract manufacturing of resin substrates for OLED displays. Currently, the plant only puts electronic components into printed circuit boards that control cameras and batteries. The operations at the new plant in a Hanoi suburb, which began production in April and mainly makes printed circuit boards for **Samsung Electronics**'s Galaxy series, have been on the right track. The company has increased the number of workers at the facility to around 300. UKC racked up some ¥28 billion in sales from its EMS business in the year through March. The company is seeking to boost EMS sales to ¥40 billion in three years by expanding operations in Vietnam, winning more contracts for the plant in Dongguan, and raising productivity.… **Sinbon Electronics** plans to build a new plant in Taiwan in order to grab a bigger share of aerospace electronics business opportunities, and to meet increasing order demands. The company held a ceremony for its new plant in Miaoli, Taiwan on October 5, taking the first steps toward making the new plant a reality, the company states in a blog post.

Compal Faces Strong Competition for Amazon Tablet Orders from China-Based Huaqin

Compal Electronics has faced increasing competition for **Amazon**'s tablet ODM orders from China-based **Huaqin Telecom Technology**. Amazon has increased ODM orders to Huaqin due to costs, according to industry sources. However, Compal declined to comment on its orders.

In the past, the first half was the slow season for Amazon tablet orders, but demand remained strong for the first half of 2016 and the upstream supply chain shipped about 1.6–2 million tablets a quarter during the period. For the second half, Amazon's tablet shipments are expected to grow strongly because of year-end holiday sales, and therefore Amazon has raised its orders with manufacturing partners.

Despite Amazon's strong orders, most upstream component suppliers are still pessimistic about their orders from the tablet industry, as overall tablet demand is still falling.

Foxconn Installs 40,000 Robots at Factories

EMS giant **Foxconn** has reportedly installed 40,000 robots to take care of manufacturing at several facilities in China.

The robots—fittingly called Foxbots—are being rolled out from the company's factories in Taiwan, Shenzhen, and Jingzhen, China. The total robot production is expected to reach about 10,000 units per year, the general manager of the automation technology department, Dai Chia-peng, told Taipei-based Central News Agency, and as reported by *DigiTimes*.

The company is currently installing the robots in a number of its manufacturing facilities in China, including a tablet plant in Chengdu, an industrial base in Zhengzhou, and in computer products and peripherals plants in Kunshan and Jiashan.

Foxconn's Sharp to Spend $570 Million on OLED Panel Production

Japan's **Sharp Corp** said it will spend $570 million on its organic light-emitting diode (OLED) screen business, one of its first major investments since it was taken over by Taiwan's **Foxconn,** although the amount pales in comparison to efforts by South Korean rivals.

Manufacturers of consumer and other electronics are gradually shifting to OLED screens, which are generally thinner and more flexible than liquid crystal display (LCD) screens.

Sharp said it will invest in pilot production lines at its plants in Osaka and in Mie prefecture, western Japan, which are due to start between April and June 2018.

Sharp is hoping to team up with its domestic rival **Japan Display, Inc.** on learning technology and related solutions.

Hanza Ends Production in Vaasa, Finland

Swedish EMS provider **Hanza** has decided to convert its standalone sheet metal factory in Vaasa, Finland to a logistics and service center.

This decision is in accordance with Hanza's Frontrunner program, where selected factories are transferred to five specific geographic areas, known as the Production Clusters.

Hanza is now working on the last phase of the program, and the to-be-closed site will be converted into a logistics and service center for local customers. The change will affect about 50 employees.

During the third quarter of 2016, the company transferred a stand-alone factory to cluster Estonia, expanded cluster Central Europe, and improved coordination of cluster China, as reported by *Evertiq*.

TechniSat Sets Up EMS Operations in Poland

The **TechniSat** group of companies develops and produces consumer electronics products. Now the company has decided to run EMS services at its Polish facility in Siemianice.

In a statement to *Evertiq*'s Polish team, Łukasz Żak, Sales Manager at TechniSat Digital Sp. z o.o., said that everything started when TechniSat sold its automotive business to **Preh Car Connect Group** during the second half of 2016.

The sale of the automotive division released some of the production capacity at the Polish facility. The production plant, which employs over 650 people, has a new EMS division ready to start business using the existing machine park and resources. The company is currently working on its first quotations and production is expected to start in the near future. TechniSat Digital is mainly focused on customers within the CEE region.

Łukasz Żak also hinted at a future investment and development plan, but couldn't go into details. The company still has spare capacity following the sale of the automotive business, so interested parties will have to wait and see what might be announced in the coming months.

Pegatron to Make Microsoft's New Surface PC Products

Microsoft is expected to announce soon its next-generation Surface Pro series 2-in-1 and notebook products, including the Surface Pro 5, Surface Book 2, and new Surface-brand desktops (likely all-in-one PCs). Most of them are expected to be made by **Pegatron Technology**, according to a Chinese-language *Economic Daily News* (*EDN*) report.

Microsoft is also expected to introduce new upgrades and functions for its Windows 10 platform.

Microsoft is expected to release three sizes for its Surface desktops: 21-, 24-, and 27-inch models, all featuring a specifically designed mouse and keyboard as well as a press-sensor stylus and Perceptive Pixel multitouch technology.

The new Surface Pro 5 and Surface Book 2 are expected to adopt Intel's Kaby Lake–based processors and biosensor technologies, the paper added.

Enics Expands Its Facility in Estonia

EMS provider **Enics** is expanding its manufacturing plant in Elva, Estonia. The expansion will add 3,900 square meters of work space to the facility.

The total value of the investment during the coming years is planned to amount to over €5 million.

With the expansion, the company will build a 3,000-square-meter manufacturing floor space and 900-square-meter office facility, starting in October 2016. The new expansion will be ready for production during the third quarter of 2017.

Enics's Elva factory is focused on higher volume production for industrial electronics customers and currently has around 650 employees.

Singapore's Flex Growing Out of Contract Manufacturer Mold

Flextronics International (Flex) is accelerating its transformation from a company that assembles electronics for others to one that offers product planning, logistics, and aftermarket support. It has a global network of bases, including one in Japan.

The company, now known as Flex, doubled the number of its "innovation labs" to six over the past year and a half. Located in the US, Germany, Israel, and elsewhere, these research centers work with corporations, universities, and other entities to create new products, technologies, and services.

Flex is planning to establish such labs in more countries, including Japan, where a 1,800-square-meter facility is due to open within the next two years. That lab will focus on the automotive and medical fields. Flex says it is considering companies, universities, and other potential partners, as well as scouting for a site in the country.

While Hon Hai excels at high-volume manufacturing of a narrow range of products, Flex's competitive advantage lies in the flexibility to handle a wide variety of products at low volumes. Flex deals with many industries, and that diversity is its strength, said Mike Dennison, president of Flex's consumer technologies group. Best known for manufacturing Apple desktop computers and Microsoft gaming consoles, Flex also takes orders for medical devices, automotive components, and electric power equipment, among other products.

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