

# Manufacturing Market™ INSIDER

inside the contract manufacturing industry

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## Consumer & Mobile Segment Takes the Lead

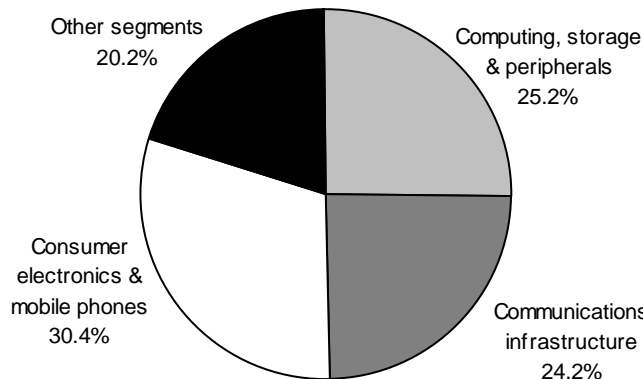
When sales from 45 of the *MMI* Top 50 EMS providers were combined, consumer electronics and mobile phones took the largest share of revenue. These results may not be applicable to the entire EMS industry, but they do show that consumer electronics and mobile phones now represent one of the two largest segments of the EMS market.

In 2006, sales from consumer electronics and mobile phones accounted for 30.4% of the \$80.2 billion in total revenue generated by the 45 providers (see Chart 1). By comparison, the segment formerly known as consumer and handheld devices amounted to 24.7% of sales from 43 Top 50 providers in 2005.

In picking up more than five points of EMS market share by this analysis, the consumer and mobile segment clearly outgrew the rest of the EMS market for the 45 providers in 2006. Mobile phone production in no small measure contributed to the growth of this segment.

From *MMI's* annual Top 50 survey, the newsletter obtained sales percentages by market segment for 47 out of the Top 50 providers. Sales percentages by segment are tabulated for each company on pages 2 and 3. In this analysis, market shares for the three largest segments were calculated by adding up sales in those segments for each of the 45 companies that provided the necessary data. Two of the tabu-

Chart 1: Market Mix for 45 Top 50 EMS Providers in 2006



lated companies, Celestica and Beyonics, did not break down sales sufficiently to be included in the analysis.

IT and communications infrastructure, once the two pillars of the EMS industry, no longer represented a majority of sales in the Top 50 analysis. Together, the two segments were responsible for 49.4% of revenue produced by the 45 Top 50 companies in 2006. That's down from a combined 57.0% calculated in the 2005 Top 50 analysis of 43 companies.

Market shares of both segments declined from values in the 2005 analysis. IT, defined here as computing, storage and peripherals, held a 25.2% share of 2006 sales, compared with 28.3% the year before, while communications infrastructure declined to 24.2% in

2006 from 28.7% in 2005. In reality, the IT segment likely accounted for a higher percentage of industry sales after taking into account the contribution of the largest provider, Hon Hai, which is a major supplier to PC market. Since Hon Hai does not subdivide its sales by market segment, the company is not included in this analysis.

Therein lies the problem with applying the Top 50 market analysis to the industry at large. Because of Hon Hai's size, its results can sway the

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metrics of the entire industry. The company's substantial sales from the PC market could return the IT segment to its traditional role as the industry's biggest segment. Still, Hon Hai is also strong in cell phones (through its Foxconn International Holdings subsidiary) and consumer electronics. Therefore, *MMI* believes that if consumer and mobile aren't the largest segment of the EMS industry, they are certainly number two with a market share of at least 30%.

The remaining market segments – industrial, medical, automotive and defense and aerospace – remain a problem for analysis. Some of the largest providers don't provide a full breakdown of their sales in these non-traditional categories. As a result, these segments have been combined into a single "other segments" category, which accounted for 20.2% of 2006 sales for 45 Top 50 providers. That's up from 18.3% in the 2005 analysis. A market share increase of nearly two percentage points shows that the growth potential of these largely underpenetrated segments is being realized.

In the past, analysis would have stopped at this point without an inkling of how large each of the remaining segments is. However, this year *MMI* decided to see what could be learned from the companies that do fully disclose what percentage of their sales comes from the various market segments. After eliminating six companies that did not meet this criterion and another whose data was ambiguous, *MMI* came up with 38 providers for further analysis. This Top 50 subset generated aggregate sales of \$35.9 billion.

For these 38 companies, sales in each market segment can be calculated and totaled, yielding a market share for each category, as shown in Chart 2 on page 3. From this pie chart, the reader can see how the smaller segments, previously lumped together, compare with one another. Of these

Market Percentages for 47 of the Largest EMS Providers in 2006								
Organization	Computing, storage & peripherals	Comm. infra-structure	Con-sumer & mobile	Indus-trial	Med-ical	Auto-motive	Defense & aero-space	Other
Flextronics	13	24	53	*	*	*		10
Solelectron (FY)	32.2	45.2	9.8	8.7		2.5		1.6
Jabil Circuit	19	19	36	*	*	5	*	21
Sanmina-SCI	45.6	29.4	10.5	*	6.5	*	*	8.0
Celestica	30	43	*	*	*	*	*	27
Elcoteq		18	82					
Benchmark Electronics	~60	15		10	15			
New Kinpo Group	50	35	15					
Venture	60 <sup>1</sup>	19		*				21
USI (Universal Scientific Industrial)	39	16	18	*		*		27
Plexus	39	8		18	26		9	
Nam Tai Electronics			100					
Jurong Hi-Tech	17.2	0.4	57.5	0.4				24.4 <sup>2</sup>
Zollner Elektronik	19	7	2	24	6	23	2	17 <sup>3</sup>
SIIX	13.6		37.8	12 <sup>4</sup>		26		10.6 <sup>5</sup>
3CEMS Group	20	10	20	40	5	5		
Kimball Electronics Group				22	36	38	4	
Elite Industrial Group		5	60	25	5	5		
Beyonics Technology	*	*	~79	*	*	*		~21
Wong's Electronics	50.2		34.6	15.2		1		
Fabrinet		100						
Alco Electronics	6	3	81			10		
PartnerTech		25		52	16		7	
Integrated Micro-electronics, Inc.	42	13 <sup>6</sup>	18	17	2	7		1
CTS Electronics Manufacturing Solutions	43	25		*	*		*	32
WKK Technology	30	10	30	15	5	5	5	
Enics				100 <sup>7</sup>				
VIDEOTON Holding	12	3	28	15	2	38	2	
Surface Mount Technology (Holdings) Limited	27.8		12.9	30.5		23.3		5.5 <sup>8</sup>
Flash Electronics	15	75		10				
Suntron	10	10	5	46	4		25	
Neways Electronics International		3		58	27	5	2	5
Orient Semiconductor Electronics	30	23	27	15		5		
Hana Microelectronics	25	10	35	15	5	10		
Simclar, (Group), Ltd.	17	31	7	38	3	2	2	
SMTC	46	37		16				
BreconRidge	18	54	2	20				6
Computime			89.3	5.2	5.2	0.4		
EPIC Technologies			6	26	49	15	1	3

\* Included in other. <sup>1</sup> Includes printing and imaging (36%). <sup>2</sup> Includes modules (21.2%).  
<sup>3</sup> Measuring technology. <sup>4</sup> May include non-industrial products. <sup>5</sup> Includes electronic components and machinery. <sup>6</sup> May include mobile phone work.  
<sup>7</sup> Includes medical and instrumentation. <sup>8</sup> Office appliances.

Organization	Computing, storage & peripherals	Comm. infrastructure	Consumer & mobile	Industrial	Medical	Automotive	Defense & aerospace	Other
V.S. Industry	1		96	2		1		
DRS Technologies								99
VTech	1	10	45	40	3	1		
Communications								
COB Technology				30	30	5	35	
MC Assembly		25		55	10		10	
Kitron	24.8			25.3	24.4		25.5	
Creation Technologies	2	36		36	13	7	2	4 <sup>9</sup>
LaBarge				55	2		43	

<sup>9</sup> Safety and security.

nontraditional categories, the largest by far is the industrial segment, which claimed 12.3% of combined 2006 sales for the 38 providers.

Industrial was more than twice the size of the next largest segment, medical. Indeed, industrial business was well represented among this subset of Top 50 providers. Of the 38 companies, 28 reported that the industrial percentage of their revenue was in double digits. What's more, 18 providers listed industrial sales at 20% or more. In ten of these cases, industrial sales were the largest piece of a provider's business.

For some of the largest providers, the industrial segment represents an opportunity to further diversify into nontraditional business. But as seen here, quite a few Top 50 companies consider industrial sales their bread and butter. From their point of view,

industrial sales are anything but non-traditional.

Another segment often labeled non-traditional is medical, which accounted for 4.7% of sales rung up by the subset of 38 providers. Of these, ten had medical business percentages in double digits, with six cases of medical sales at 20% or more. Clearly, medical business is not as well developed among these companies as the industrial segment is.

While only 3.3% of subset revenue came from the automotive segment, five providers derived 20% or more of their sales from the segment. Garnering an even smaller slice (2.3%) of subset sales, the defense and aerospace sector also claimed five providers with sector sales at 20% or better.

Although market segment percentages calculated for the subset are useful for comparisons, they probably

cannot be extrapolated to the entire Top 50. The five smallest categories in Chart 2 should correspond to the "other segments" category in Chart 1. But when those Chart 2 categories are added, the total is 24.1% versus 20.2% for the other segments category in

Chart 1. This difference means that five smallest categories as a whole are somewhat overweighted in the subset.

*Editor's note:* As footnoted in the tables, some data was supplied that did not fit into a Top 50 category or included sales from more than one category. Ambiguities among the largest providers were eliminated from calculations, and *MMI* does not believe that the remaining potential sources of error had a material effect on results. Also, in one case (Solectron) market segment data corresponded to fiscal year rather than calendar year results.

Finally, market segment percentages for 2005 were revised after the recent discovery of a spreadsheet error in the 2005 data. Revised 2005 percentages presented here replace those published in April 2006.

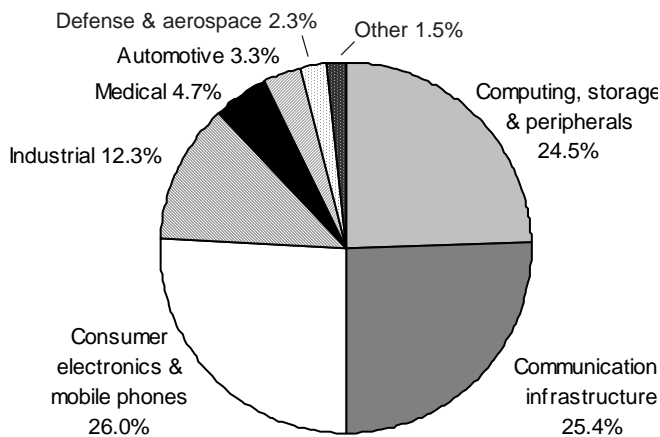
## Design

### Platforms Seen as Necessity by Some

With the rise in design outsourcing, OEMs are expecting more and more on the design side from their EMS providers. One approach to such outsourcing is to offer OEMs a pre-engineered reference design, or platform, on which a product design can be based. Two of the largest EMS providers recently introduced platforms, adding credence to this approach. Yet investing up front in a design platform goes against the traditional EMS model of being paid as services are rendered. Nevertheless, these two providers, **Celestica** and **Flextronics**, view platforms as an essential part of a design-plus-manufacturing solution for certain applications.

In November 2006, Celestica along with two partners, **Freescale Semiconductor** and **Wavesat**, brought out a WiMAX reference design for customer premise equipment (Dec. 2006, p. 5-6). Within a WiMAX portfolio, Celestica also has reference designs,

Chart 2: Market Mix for 38 Top 50 EMS Providers in 2006



which it calls Solution Accelerators, for a radio remote head and a base station. The company's WiMAX offering has gained "a lot of traction," reports Paul Barsley, VP of design and engineering services at Celestica.

Celestica's repertoire of Solution Accelerators also includes blade servers and ATCA. What's more, the provider is working on a number of things in storage, but hasn't announced anything yet. In the consumer space, Celestica is looking at areas that might be the right fit for a reference design.

"We believe we need to do this in certain microverticals because if we don't, our competition is doing it or an ODM is doing it," Barsley told *MMI*. "This is just something our customers are now expecting from their supplier."

For Celestica, Solution Accelerators are all about time to market. It's much faster starting from a platform that already works than from a clean sheet of paper. "Somewhere on the order of about six months would be the sort of timing that you might be able to save on, say, a 12- to 15-month program," says Barsley. But he adds, the savings will vary depending on the nature of the project.

There's another reason platforms appeal to Celestica. According to Barsley, platforms give Celestica credibility in a product area by demonstrating the company's know-how and experience in that area.

Flextronics is another provider that has developed platforms in multiple product areas. The company is well known for its mobile-phone platforms. Now the company has introduced its G700 Quad-Core platform, which is a high-performance server motherboard based on the Quad-Core **Intel** Xeon processor. The platform is intended for networking, security and storage appliance applications.

In developing the G700, the advantage for Flextronics was not so much time to market as access to Intel tech-

nology. "Having the opportunity to get access to the technology to be able to do the boards early, to be able to basically go up the learning curve faster than other companies who are not in this position of seeing the silicon early and being able to do that testing, we're in a position where we can offer our OEM customers a higher quality, more reliable type of system when they're ready to select an ODM manufacturing and development partner," says Sean Burke, president of Flextronics' computing segment.

Are platforms becoming a necessity for EMS providers who want to offer a full design solution? Yes, says Burke. "If you just do your typical contract manufacturing and assembly, you're going to lose out," he says, noting that outsourcing in the computing sector has now reached the server level.

In that sector, Flextronics' strategy is to take on more of the design like an ODM would and then parlay design services into manufacturing products for customers.

### **Small Providers Acting Big**

Some small providers want a piece of the design-cum-manufacturing business that would normally be out of their reach. To bring this business within their grasp, these providers are building offerings of design-plus-manufacturing services typically found in much larger companies. Combining design and manufacturing services can be done through acquisition or alliance. Or an EMS provider can take the greenfield approach to adding design services. Below are examples of all three routes to a combined offering.

#### **Pooling efforts by acquisition or alliance.**

An EMS provider can acquire a design house, but that's not always the case. Consider **Design Solutions Inc.** (Santa Barbara, CA), a provider of

engineering, design, simulation and prototype services. DSI recently acquired **Paradigm Manufacturing Partners**, an EMS provider based in Garden Grove, CA.

"This acquisition helps DSI close the gap between design and manufacturing to provide a full product development solution under one umbrella," stated Sean O'Neil, president and CEO of DSI. This solution, he added, includes concepts, industrial design and mechanical engineering, electrical engineering, FPGA/ASIC development, software integration and development, as well as PCB design and manufacturing.

Founded in 1989, DSI operates seven locations in the US and two in Europe.

In another case, **Synchronized Manufacturing Technologies** (Salem, NH) took the alliance approach to a combined service offering. The EMS provider recently formed a partnership with **Prime Circuit Board Design** (Derry, NH). According to Synchronized, the venture brings a new set of PCB design services to its customer base.

The two companies have worked together for several years, and the alliance formalizes their relationship.

Synchronized said the addition of these services, coupled with its capabilities, brings it one step closer to reaching its goal of offering tier-one services and capabilities tailored to low-volume, high-mix market segments.

#### **Design bet paying off**

**Eastek International**, an EMS provider with headquarters in Buffalo Grove, IL, and manufacturing in China, took a greenfield approach to establishing its design services launched last year and is reaping the rewards from that effort.

"First quarter growth was 43% over first quarter last year, and the design services that we're offering are a key



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contributor to that growth,” says Bob Wiegand, VP of sales and marketing for Eastek. Indeed, 60% of the company’s new customers are using its design services.

Eastek is offering a full range of design services, starting, if necessary, from a concept and ending with a fully designed product. That means supplying in house the necessary electrical and mechanical engineering and industrial design, capabilities not usually associated with a company the size of Eastek. Its sales goal this year is \$37 million.

The company also mimics some larger providers by splitting its engineering resources between high- and low-cost locations. In Buffalo Grove, a lead mechanical engineer and a lead electronic engineer serve as technical liaisons between customers and Eastek design engineers in China. As a result, customers enjoy “the convenience of local support in the same or very similar time zone and in the English language,” says Wiegand.

Design work takes place at Eastek’s campus in Dongguan, China, where the company maintains a staff of ten

design engineers. Starting out with a partial staff in the fall of 2006, this design team was at full strength by the end of 2006. Eastek expects to add staff as more and more projects roll in.

The company’s greenfield approach to obtaining design capabilities began with the Q2 2006 hiring of its VP of engineering. Wiegand says Eastek added these capabilities at the request of its customers.

Eastek can provide examples of what it is capable of designing. For the automotive after market, the company designed a product that can be used to reprogram a vehicle to improve performance such as fuel mileage. In another case, Eastek engineered a medical product used to prevent human still births. Both products are electromechanical assemblies.

But Eastek is not attempting to be all things to all companies that would outsource design. Wiegand says there are some areas where the company does not have the expertise to complete a design.

Vertically integrated Eastek operates five plants on its Dongguan site with manufacturing space totaling

465,000 ft<sup>2</sup>. Based on growth plans for 2007, Eastek expects its work force to increase to 1,800 employees from the current level of about 1,200. Vertical integration includes plastics, metal stamping and magnetics. The company is American-owned, having been purchased by Joe Rocco, Eastek’s president, and other investors in 2004. As a US corporation bound by US law, Eastek promotes its ability to protect intellectual property in China.

Of Eastek’s top 20 customers, 19 are business units of multinational corporations where unit sales are under \$60 million. These customers aren’t large enough to put in their own infrastructure in China. They also appreciate the local support provided by Eastek, says Wiegand. Besides design services, that support covers project engineering, program management and warehousing.

Eastek plans to expand its US-based services to include quick-turn prototyping and pilot runs, currently done in China. To that end, the company is looking to acquire a US-based quick-turn house or EMS provider in the next 12 months.

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## News

### ***Solectron Makes Medical Deal***

**Solectron** (Milpitas, CA), which is pushing to build up its medical business, recently acquired an unnamed medical design firm developing software-driven electromechanical devices. Solectron’s only mention of this deal came from the prepared remarks of interim CEO Paul Tufano during the company’s fiscal Q2 conference call on Mar. 29.

“This acquisition strengthens Solectron’s competitive position in the medical equipment market and will help us drive greater penetration of this key vertical,” said Tufano.

Solectron’s value proposition in the

medical market is to offer engineering design services coupled with manufacturing. This approach can also be seen in the company’s recently formed medical alliance with four firms, three of whom are in the product design business (Feb., p. 6).

### ***First US Facility for Canada’s Adeptron***

Publicly held **Adeptron Technologies** (Markham, Ontario, Canada) has reached an agreement to acquire **Pacific Circuit Assembly** (PCA), an EMS provider based in San Jose, CA. The deal will give Adeptron its first plant in the US.

The total purchase price is \$2.25 million for PCA, which had 2006 revenue of about \$3.2 million. PCA’s sales

generally come from consignment work (which doesn’t include the purchase of raw materials). PCA’s offering includes SMT and through-hole board assembly along with test and system build capabilities.

“The capabilities and skill sets that PCA brings to Adeptron position us extremely well as we begin to penetrate the California marketplace,” stated F. Michael Marti, president and CEO of Adeptron.

“For PCA’s current customer base, Adeptron provides an expanded global supply chain and turnkey service offering. The revenue potential of this acquisition should be enhanced by allowing the possibility of converting some portion of PCA’s current labor-only sales to turnkey and by greatly expanding the potential customer

based to include those who desire turn-key services," he said.

Adeptron plans to finance the majority of the proposed acquisition by internal means and the remainder with stock issued to the principals of PCA. Subject to customary conditions and the completion of due diligence, the transaction is expected to close within 45 days. The acquisition is expected to be accretive to the company's earnings.

In 2006, Adeptron generated sales of Can\$43.8 million. The provider operated three manufacturing facilities in Ontario, Canada, and employed 335 people as of October 2006. Adeptron has also engaged a China-based partner, **CVIC Software Engineering**.

### **Delta Group Acquires Provider in Florida**

**Delta Group Electronics** (Albuquerque, NM), a privately owned EMS company, has purchased the assets of **Singletec** (Sanford, FL), another EMS provider.

This is Delta's third acquisition of an EMS company in two years and follows purchases of **Frontier Technologies** (San Diego, CA) in 2005 and **Assembly Solutions** (Dallas, TX) in 2006.

According to Delta Group, this latest acquisition will enhance the company's manufacturing and assembly capabilities to better serve customers on the US East Coast. "Singletec is a well-established, highly respected EMS company in the Florida market, and we plan to strengthen and expand our position in this market through the integration of Singletec with our existing operations in Rockledge [Florida]," stated Harry Mueller, president of Delta Group.

Singletec performs PCB and electromechanical assembly for its customers located throughout Florida.

Kurt Story, president of Singletec, will join Delta Group as sales and marketing manager for Florida, report-

ing to Ron Reef, Delta Group's GM for Southeast Operations. Delta Group plans to consolidate its two Florida facilities into the Rockledge location by late 2007.

Founded in 1987, Delta Group offers turnkey EMS for customers in the aerospace, defense and commercial sectors. In addition to its Florida locations, the company operates manufacturing facilities in its Albuquerque home base; Dallas, TX; and San Diego, CA.

### **PartnerTech Adds Development Firm**

Top 50 EMS provider **PartnerTech** (Malmö, Sweden) has acquired **Labyrinth Development** (Fredrikstad, Norway), a firm with expertise in design and development from concept to finished product. With some ten employees, Labyrinth reported 2006 sales of almost NOK 10 million (\$1.7 million at current rates).

"The acquisition is a valuable addition to the business that we acquired in Moss, Norway, during 2006 and part of our ongoing internationalization strategy," said PartnerTech CEO Mikael Jonson. That earlier acquisition was **Th Kristiansen**, a contract manufacturer specializing in sheet metal and systems.

Labyrinth has focused on automation, marine and medicinal products in electronics, mechanics and plastics.

The firm will become part of PartnerTech's development division in Moss, consisting of 30 engineers, designers and product developers.

*Deal underway...* **Jurong Technologies** (Singapore), a publicly held EMS provider, earlier this year entered into an agreement to acquire **Amould Plastic Industries** (Singapore), a plastic components manufacturer. The purchase price is \$54.09 million (about \$2.7 million), most of which is in Jurtech stock. This acquisition also in-

volves using Jurtech shares to pay off a \$51.58-million loan owed to Amould directors. Jurtech said the acquisition will allow it to supply an added range of products to its customers.

*New business...* **NEC** has renewed its manufacturing agreement with **Celestica** (Toronto, Canada). As part of this agreement, NEC will outsource its optical network system product portfolio to Celestica for two years. Celestica will provide NEC with design, prototyping, NPI and full systems assembly.... **Nextlink** (Copenhagen, Denmark) has chosen **Flextronics** (Singapore) to produce Nextlink's high-end consumer headsets in Denmark.... **Universal Scientific Industrial** (Nan-Tou, Taiwan) has received orders from several tier-one automotive suppliers and car makers for voltage regulators, tire pressure monitoring products, and high-brightness LEDs. According to USI, it is the only company in Taiwan certified by **Nissan**.... **BreconRidge Manufacturing Solutions** (Ottawa, Canada) has landed a four-year contract from **Thales Nederland B.V.** to manufacture transmit/receive modules and switch matrix modules, which form the heart of the antennae used in Thales' active phase array radar system.... **Bartolini After Market Electronics Services** (BAMES), the former Italian subsidiary of Celestica, will serve as the exclusive European manufacturer of wireless communication modules developed by **Telit Wireless Solutions**, the US-based mobile technology arm of **Telit Communications** (Trieste, Italy). A BAMES subsidiary in Vimercate, Italy, will completely take over present and future production of Telit's wireless communication modules for a term of not less than five years. BAMES will also invest 16 million euros in Telit's machine-to-machine business.... The **US Department of Defense** has awarded **Endicott Interconnect Technologies** (Endicott,

NY) contracts totaling \$164 million to produce card frame assemblies in support of a high-reliability, high-performance computing application. This work includes organic semiconductor packaging, module assemblies, PCBs, functionally-tested board assemblies and engineering services....**LaBarge** (St. Louis, MO) has received additional orders totaling \$4.4 million from **Modular Mining Systems** (Tucson, AZ) for continued production of electronic assemblies used in mine information systems (Oct. 2006, p. 7).

*Expanding in Kentucky...* Solectron has opened a 500,000-ft<sup>2</sup> facility in Louisville, KY, to support growing demand for service parts logistics and warranty repair provided by the Louisville operation, Solectron's largest center for aftermarket services. Prior to moving to the new facility, Solectron operated two separate facilities in Louisville, which had a combined capacity of 310,000 ft<sup>2</sup>. According to Solectron, it is the largest provider of aftermarket services in the world.... **SMC**, an EMS provider in Lexington, KY, plans to add 18,000 ft<sup>2</sup> to its 55,000-ft<sup>2</sup> facility there. The company said continued growth of its customer base created the need for this expansion.

*Some company news...* A newly formed trade union at **Foxconn's** site in Longhua, China, held its first meeting last month, reported the *China Daily*. This could also be a first for the EMS industry in China. At least it's the first instance of such a union reported in these pages....**Integrated Microelectronics Inc.** (Laguna, Philippines) has opened a subsidiary, **IMI Japan**, in Tokyo, Japan. IMI upgraded its sales office in Tokyo to a subsidiary that will focus on building relationships with Japan-based OEMs, which account for 53% of IMI group revenues. As a front-end design and development center, the new subsidiary can serve as a bridge between cus-

tomers and IMI's engineering centers during product development. ...**Nam Tai Electronics** (Macao) recorded a one-time gain of about \$30 million from the sale of shares of **TCL**, in which Nam Tai invested in 2002.

*People on the move...* Solectron has appointed Roop Lakkaraju senior VP and interim CFO. His prior role at the company was senior VP, business support, responsible for Solectron's business finance organization....Flextronics has announced that Peter Tan, president and managing director of Flextronics Asia, will retire on June 30. Also, Michael Burger, president of Flextronics' components business unit, is leaving the company to become president and CEO of PCB fabricator **Merix** (Forest Grove, OR)....After a short tenure as CEO of Nam Tai Electronics, Warren Lee has resigned from the company to accept the position of managing director of a Hong Kong-listed investment firm. He served as Nam Tai's CEO from Dec. 1, 2006. M. K. Koo, the company's chairman and founder, will serve as interim CEO....Celestica has hired Tony Rakoczy as VP, global commodity management, based in Hong Kong. Before Celestica, he oversaw Greater Asia regional procurement for **Kodak** in Shanghai, China....**Elcoteq** (Espoo, Finland) has appointed Anssi Korhonen president for the company's Asia-Pacific area effective June 1. He will also continue in his current role as senior VP of product development services. Korhonen will be based in Hong Kong....Sami Mykkänen has joined **Incip** (Oulu, Finland) as VP, manufacturing services. He comes from **Powerwave** Shanghai, where he worked as manufacturing director. ...Scott Penin, president and CEO of **Paradigm Manufacturing Partners** (Garden Grove, CA), has been named VP of global manufacturing at **Design Solutions Inc.** (Santa Barbara, CA), which acquired Paradigm (see p. 4).

*More restructuring...* Solectron is starting the second phase of a restructuring plan, the first part of which was announced in October 2006. The company estimates that restructuring and impairment charges from the second phase will amount to \$35 million to \$45 million. Scheduled for completion within the next 12 months, this phase will reduce Solectron's work force by about 1,300 to 1,500 employees and will close or consolidate about 400,000 ft<sup>2</sup> of facilities, primarily in North America, as well as Western Europe. According to a report from the *BBC*, Solectron plans to close its plant in Cwmcaru, UK, identified by the *BBC* as an after-sales services location....As part of a plan to restore profitability and competitiveness, Elcoteq intends to close its manufacturing facility in Juarez, Mexico, and to move Juarez production mainly to China and partly to Elcoteq's other Mexican facility in Monterrey by the end of 2007. Acquired from **Thomson** at the beginning of 2005, the 13,700-m<sup>2</sup> plant manufactures set-top boxes and communications network products. At the end of March, the plant employed 2,335 people. Other actions to be taken under this plan include closure of Elcoteq's plant in Lohja, Finland, and its design center in Turku, Finland. The action plan will result in one-time restructuring costs of roughly 35 million euros. Included in this amount are writedowns of Elcoteq's design-related holding in **Cellon**, a wireless handset design house, and associated receivables for around 14 million euros. In 2003, Elcoteq and Cellon entered into an agreement whereby Elcoteq would serve as Cellon's preferred manufacturing partner. Owing to changes in Elcoteq's product development organization and to Cellon's financial and structural situation, utilizing this partnership in the originally intended manner no longer seems possible, Elcoteq stated.

### Skilled Labor Shortfall in China and India

The *New Yorker* magazine would seem an unlikely source of inspiration for this column. A venerable bastion of highbrow tastes, the *New Yorker* is not known as a font of business information. But the magazine's financial page in the April 16 edition described a shortage of skilled labor in India. This report brought to mind a similar problem in China, which also faces a scarcity of qualified professionals (Jan., p. 5). Rapidly growing economies in both countries have created a dearth of technical manpower. For those who see China and India as virtually limitless pools of technically skilled labor for the EMS industry, there is a different reality on the ground.

Some years ago, this development would not be worrisome for the EMS industry. Low-cost factories were not engineering intensive. They relied on high-cost facilities to perform NPI and run initial production until product and processes were stabilized. High-cost locations usually handled test engineering as well as DFM and any product design work being done by the provider. But the low-cost facilities of today are often equipped to provide a complete manufacturing solution from NPI through volume production. This

means having a staff of process and test engineers as well as professionals in procurement and accounting, not to mention plant management.

A second aspect compounds this labor problem. OEMs are increasingly interested in outsourcing some or all of their product design, and EMS providers are quite willing to oblige. But lower engineering costs in places such as China entice providers to move design functions there to save money. As providers more and more turn to China for design engineering, there is greater demand for engineering talent and less of it available.

Ostensibly, India could be part of the solution, rather than the problem. After all, the country graduates something like 400,000 engineers a year. But the *New Yorker* article pointed out that a Duke University study found only 170,000 of them equivalent to U.S. engineers. Furthermore, a mere 3.6% of the engineering graduates each year in India "were of international quality," reported *Reuters*, which cited a 2005 review by India's National Association of Software and Service Companies. The *New Yorker* blames India's lack of skilled labor on underinvestment in higher education.

A shortage of skilled professionals in China, India and other low-cost countries that have not kept up with

the demand for these people could well be one of the greatest challenges facing the EMS industry in the future as it shifts more and more capacity to low-cost regions. Low-cost factories are becoming the bread and butter of global providers. These factories are nothing without engineers, managers and support staff.

Will the EMS industry come to a screaming halt due to a lack of skilled labor in low-cost regions? Of course, not. But the industry will pay more for talent, take more time finding it, and spend more on in-house training.

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