Contract Electronic Manufacturers with Staying Power:

How three small-to-medium-sized companies have achieved lasting success in this tough, dynamic industry

By Pamela J. Gordon, CMC
President, Technology Forecasters Inc.
and TFI Supply Chain

TFI
SUPPLY CHAIN

Hon-Hai, Flextronics, Jabil, Sanmina-SCI, Celestica, and a few others with annual revenues in the US$5+ billion to the trillions stand like skyscrapers in a cityscape populated by thousands of smaller companies that—like the skyscrapers—also assemble electronic components into finished goods for name-brand electronics companies. These high profile suppliers are the ones garnering the world's attention: they boast 40+ global manufacturing facilities (leveraging especially low-wage regions for significant growth), and occasional dramatic growth, pleasing investors. The far more numerous companies in the industry—10 to 100 times smaller than the giants—are often ignored or minimized. Some pundits propose that they not even be called Electronic Manufacturing Services (EMS) companies, claiming that they are not in the same business as the giants. Yet, the most successful of the smaller companies have enviable profitability, world-class certifications, and loyal customers, suppliers, and employees.

We at Technology Forecasters Inc. consider these thriving small-to-mid-sized electronic contract manufacturers to be giants in their own right - in building loyal relationships with customers, suppliers, and employees, and demonstrating a business acumen (albeit without the muscle power and enormous global scope) that their larger cousins should envy. In this white paper, we will highlight three such companies that have been in business for at least 15 years and that have not built manufacturing facilities in low-wage regions. By interviewing the CEOs of these three companies—all of whom TFI has known for many years—we will show how management has survived economic fluctuations, parts shortages, demanding customers, and an ever-broadening scope of services, while competing with companies leveraging low-wage regions, huge buying power, and economy of scale.

THE THREE PROFILED COMPANIES

TFI has been acquainted with Digicom Electronics (based in Richmond, California), Nistec Group (headquartered near Tel Aviv), and PartnerTech (Sweden) for at least 15 years, during which time we have followed their management philosophies, business expansions, and milestones (a new facility, an award of a quality certificate, expanded services). We chose to profile these three small-to-mid-sized companies, because each has:

- Been manufacturing electronic products on behalf of name-brand electronics companies for at least 15 years
- A positive P&L and balance sheet, with a strong pipeline
- A good reputation amongst their customers, suppliers, and employees
- Competed successfully with companies many times their size
- Something to inspire the rest of the industry—regardless of size

The companies and CEOs are introduced in Table 1.

TABLE 1
Introducing the Three Profiled Companies

COMPANIES	CHIEF EXECUTIVE	LOCATION OF FACILITIES	BEGAN ELECTRONICS CONTRACT MFG.	HIGHLIGHTS
Digicom Electronics	Mo Ohady	Richmond, California, USA (near San Francisco)	1982	Technical niche and international certifications
Nistec	Yitzhak Nissan	3 manufacturing sites in Israel: central, northern, and northwest	1997	Customer seminars; supplier relationships
PartnerTech	Leif Thorwaldsson*	Sweden (HQ), UK, USA, Norway, Finland, Poland, (and China through a partnership)	1989	Management training, investments during economic down cycles

During January 2011, TFI interviewed each of the CEOs (in-person at Digicom; by phone for Nistec and PartnerTech), asking these three questions:

- What three factors have led your company to survive and thrive?
- What three challenges have you experienced in the industry and how have you overcome them in a way that perhaps other small contract manufacturers (CMs) have not?
- What has helped you to compete with mid-sized and larger CMs?

Read on to learn the answers for each company. But first, we'll share insights gleaned from the CEOs' responses regarding common themes of success.

THREE COMMON THEMES FOR SUCCESS

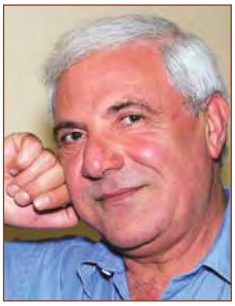
Though these three thriving companies are based in very different geographic locations —the USA, the Middle East, and Scandinavia— they share at least three common themes that contribute to their success: creative training of customers and employees, forethought applied to supply-chain issues, and technical focus (summarized in Table 2). And the overarching asset common to all three is having a strong, ethical, creative CEO.

*During my 1995 visit to PartnerTech in Sweden, the CEO at the time was Mikael Jonson.

Focusing on customers and employees, smart thinking about their supply chain, and finding a strong technical niche appear to be key factors in helping these small to mid-sized contract electronic manufacturers thrive.

Now let's look at the individual company profiles.

DIGICOM ELECTRONICS (Richmond, California, USA)



Mo Ohady

Digicom conducts prototype through production-run electronics manufacturing for the biomedical, internet, telecommunications, and aerospace industries, enjoying a loyal and growing set of electronics company customers from all over North America. The company collaborates with customers in all aspects of the process from the design to the final, fully compliant product. Material procurement and management services include planning, purchasing, expediting, and warehousing of components and materials.

I met Mo Ohady in 1987—five years after he started Digicom Electronics and the very year I started Technology Forecasters. With our offices only a few miles from each other's (on the East Bay of the San Francisco region—an hour north of Silicon Valley), we would meet now and then for lunch and discuss the ins and outs of the industry. I always felt that Mo's insights on the industry and what it takes to keep customers, suppliers, and employees

TABLE 2
Three Common Themes for Success

THEMES	DIGICOM	NISTEC	PARTNERTECH
Creative training of customers and employees	Quality training—both "home grown" and according to ISO guidelines	Seminars for customers, bringing in world-respected experts	Consistent training of all managers in leadership, target setting, and KPIs
Forethought applied to supply-chain issues	Forecasting materials shortages and buying ahead to prevent delays	Loyal relationships with suppliers, starting with great payment terms	Global purchasing / sourcing locations to balance the situation of components shortages
Technical focus	Deep technical expertise in selected niches, including biomedical, telecom, and aerospace	Three technology experts in each site who excel at new technologies and launch them on time	Internal "engineering consultancy" designs customers' products—from development through DfM

Terms: ISO=International Organization for Standardization; KPI=Key performance indicators; DfM=Design for manufacturing

happy were perceptive and accurate. Over time I noticed that for a small-sized electronics manufacturer, the company's technical and quality attributes were anything but small sized. This was proven not only by the impressive and growing array of specialized manufacturing, analysis, and test equipment in the facility and the third-party certifications for international standards, but also by the loyalty of Digicom's customers over the years.

> **" I owe our success to technical expertise in our niche, high quality work, and strong customer relationships that we nurture through end-to-end services – not piecemeal work that burdens our customers in meeting their end customers' needs. "**
>
> — **Mo Ohady**
> **Digicom Electronics**

Those familiar with the San Francisco Bay Area know that the cost of living is one of the highest in the world. Yet by leveraging automation, doing things right the first time, and providing customers with end-to-end services, Digicom has become a profitable and competitive supplier to some of the world's most respected biomedical, internet, telecommunications, and aerospace companies. Because nearly all of Digicom's customers demand the highest levels of reliability for mission-critical performance, Ohady has steadily invested in optical and X-ray inspection, functional test platforms, spectrum analysis, burn-in chambers, automated test equipment, and other specialized automation.

Digicom grew slowly in a calculated way, identifying companies within its areas of specialty and accepting only those customers whose needs match Digicom's strengths. "The affect on our business from the recent economic downturn was minimal," says Ohady, "because of how we choose and work with customers on a long-term basis." He explained that Digicom often supports customers' engineering departments with prototyping for two years before the product is finalized and introduced. Examples of this long-term collaboration include space science research through the University of California Davis and other universities and scientific and government research facilities around the world.

"I owe our success" says Ohady, "to technical expertise in our niche, high quality work, and strong customer relationships that we nurture through end-to-end services—not piecemeal work that burdens our customers in meeting their end customers' needs." A recent example is the collaborative process with which Digicom produced a reconfigurable open architecture computer hardware (ROACH) system by collaborating with researchers in design, development, prototyping, sourcing, manufacture, test, and final production of the fully compliant product. The ROACH system collects and analyzes high speed digitized data, and was developed for space science and research applications.

Ohady explains that Digicom successfully competes with much larger companies in

large part because of Digicom's independent certification to quality standard ISO 9001:2008 and medical-device quality standard ISO 13485:2003 certificates. "Having started Digicom Electronics in 1982," he says, "quality has been my overarching principle in the way I select and manage employees, design the facility, and interact with customers – electronics companies in the industrial, medical, telecom, computing, and aerospace industries. It was rewarding to have received these two special certifications."

Ohady says that an impetus for Digicom and its employees to attain ISO 9001:2008 and ISO 13485:2003 certifications was to raise awareness of the company's global competitiveness. "Our customers hail from Silicon Valley and other North American locations; we are pleased that receiving these two certifications has enlarged the scope of requests for quotations from OEMs seeking high-quality manufacturing services."

The largest challenge facing Digicom in recent years has been industry-wide shortages of components specified by the customer, when the longer lead times would delay customer shipments. Digicom's solution was first to predict shortages, then to offer that the OEM customer commit to long-term purchases such that Digicom could purchase the parts ahead of time – avoiding product delays. "With close attention to our customers' bills of materials and business cycles, we often forecast parts shortages more accurately than do our customers," says Ohady. "And through our trusting partnerships with customers, we find a way to procure those hard-to-get components before the shortage is in full swing."

NISTEC

Yitzhak Nissan

Nistec, based in Israel, builds electronic products for more than 150 customers in these sectors: communications, medical, defense, aerospace and automotive. In most cases, Nistec also ships the finished products directly to customers and distribution points all over Europe, the Middle East, and Africa. The company is certified to ISO 9001, 14001:2003, and 13485:2003.

I first met Nistec CEO Yitzhak Nissan in the winter of 1998 at a Nepcon West Conference. I heard him asking particularly intelligent questions at the conference sessions, and went to introduce myself. When I heard him say his company is based in Israel, I told him of my upcoming vacation to the country. Very quickly, he arranged for me to speak one afternoon during my trip about the global electronics contract manufacturing industry to representatives of his CEO Forum—an impressive cadre of executives from electronics companies (both those indigenous to the thriving Israeli technology industry and also subsidiaries of North American and European-based companies). It was clear to me how much the executives respected Nistec and its CEO, and appreciated the training he sponsored. From there, Nistec commissioned me to return to Israel in 1999 to give a day-long seminar to the CEO Forum. That was followed by two more full-day seminars during the next 10 years. The program is now called

Nistec Sunday Training (Sunday is a regular work day in Israel). Representative topics include:

- Design for Assembly
- Design for Testability
- New Technologies in Printed Circuit Board (PCB) Manufacturing
- High-Density Interconnect & High-Speed PCB Design
- Understanding Signal Behavior on PCBs
- Thermal Processing
- Repair and Rework of BGA, uBGA, QFN, LGA

In this industry, it can be challenging to provide customers with the swiftly escalating technologies demanded in part by tight-density printed circuit boards, such as micro BGAs and 0201. Nissan explains how Nistec stays ahead of the technology curve, "We have three of our own technology experts at each site; they have to master the latest technologies and launch them on time in our customers' products." The technology seminars help as well, he adds, which he says his competitors don't have.

Nissan addressed how his company has consistently overcome the industry's significant part-shortage challenges during the past couple of years. "Buying components for customers on time has been a very big challenge in the past 2 years. We succeed because of our great relationships with suppliers; they actually try to help us." He gave the example of Nistec needing 70% of a supplier's inventory for a particular part, when another contract manufacturer wants 60% of it. "We'll get it. We pay exactly on time; not even one day late. Our suppliers receive a notice 3 weeks in advance about the specific payments they'll receive. Our suppliers don't call us about when they'll be paid, as they do other large, international contract manufacturers." He summarizes this way, "If your supplier supports you, you can manage parts shortages."

> **" Each and every employee knows that customers depend on us, especially if they need something special or urgent. We have to do our best and even more to give customers what they need to get their products to their customers. Each employee feels this imperative. "**
>
> — **Yitzhak Nissan**
> **Nistec**

I have toured Nistec's facilities several times over the years and witnessed employees from divergent backgrounds working well together to focus on customers' products. "Each and every employee," says Nissan, "knows that customers depend on us, especially if they need something special or urgent. We have to do our best and even more to give customers what they need to get their products to their customers. Each employee feels this imperative."

One way Nistec executives nurture employees' loyalty is to take employees on day-long fun tours around the country and to organize parties. Nissan says, "It's a free country.

Sometimes another company tries to lure a Nistec employee by offering them a high salary. We give employees the feeling that our factory is their home and we treat them well. In fact, some competitors' employees want to work with us."

Another way Nistec competes successfully with larger contract manufacturers is customer service. "They are big and cannot treat each customer like they are the only son. Our customer-oriented managers can help them find all the solutions they need. Our customer doesn't get lost among other customers. This is the main difference between us and larger CMs."

PARTNERTECH

Leif Thorwaldsson

Swedish-based PartnerTech focuses its contract manufacturing services on these markets: Clean Tech, Med Tech and Instrumentation, Information Technology, Point of Sale Applications, Maritime, and Defense. PartnerTech meets the ISO 9001 Quality Management Standard, ISO 14001 Environmental Management Standard and ISO 13485 Medical Device Standard, and supports customer-specific requirements such as Quality System Regulation for the medical technology industry and Quality Assurance Test for the telecom industry.

In 1995, Mikael Jonson (CEO of PartnerTech at the time) engaged TFI to travel to Sweden to train about 50 employees in the dynamics of the global electronics contract manufacturing industry, then consult with the five core managers regarding business strategy for building on their success. The session included a tour of the up-to-date manufacturing facility, where I marveled at seeing employees transporting piece parts on bicycles—riding on the factory's clean and shiny floors. I remember that on day two—during the executive session—I introduced TFI's Vision Tree tool for establishing vision, goals, and accountability. One of the "branches" of the Vision Tree I introduced to contract manufacturers in trainings was "Social / Environmental Responsibility." At the time, social and environmental responsibility was a novel idea for nearly all of the contract manufacturers I encountered in Asia and North America (with the exception of Canadian-based Celestica), and so at PartnerTech I was prepared to explain the concept and convince the executives of the corporate benefits of such a strategy. Mikael Jonson and his executive team looked at each other, then Jonson very politely pulled out PartnerTech's social and environmental policy—impressively fleshed out with complete buy-in by all managers. During dinner conversation, Jonson and another couple of executives talked more about the intersection between their personal values (for a just society), their chosen business practices (to weave these values, profitably, into their corporation), and Swedish Government policy (which had gone a bit too far, they felt). For me, it was a refreshing and enlightening conversation.

For this white paper, I had the pleasure of interviewing current President and CEO Leif Thorwaldsson, who has continued and furthered PartnerTech's tradition of success.

I was pleased when Thorwaldsson mentioned that their strongest market at this time is Clean Tech—in keeping with the company's long-held value of environmental responsibility.

> **"We have established four centers of excellence across several countries, one each for electronics, sheet metal, integration, and machining; these centers set the standards for the group."**
>
> **— Leif Thorwaldsson PartnerTech**

The three factors that have led PartnerTech to survive and thrive over the years, says Thorwaldsson, are their breadth of services (including product development), geographic locations, and investments during economic downturns. "We supply customers with electronic, mechanical (machining and sheet metal), and systems integration, with engineering resources throughout." He compares the company's product development services to an engineering consultancy optimizing efficiencies and designing for cost-effective production, referencing that 70% of a product's cost is generated in the development stage. As for the geographies into which this Swedish company has spread, manufacturing locations include the UK, USA, Norway, Poland, Finland, and of course Sweden. PartnerTech also provides customers with manufacturing and component-sourcing services in China through a partnership with 3CEMS. Eastern Europe has been a strategic location for PartnerTech for serving mainly European customers with both manufacturing and component sourcing.

As for PartnerTech's courage to invest in new equipment and factories (e.g., in Poland Sept. 2010) during the recent economic downturn, Thorwaldsson says, "The timing was good as the business cycle was down. We saw signs of constricting business conditions early in 2006, so we took action at the right time with internal changes from Western to Central and Eastern Europe. At the same time, we kept strategic sales and development resources and relationships close by to customers in European countries—even if manufacturing was elsewhere."

As for challenges, Thorwaldsson starts off by describing how PartnerTech has met pricing pressures in the business, while maintaining a close dialog and proximity to the customer. "It's challenging to find the right organization for that, but we have accomplished it" by moving some manufacturing to Eastern Europe (Poland) and Asia (through the partnership in China). Plus, to balance the component-shortage situations, PartnerTech has located global purchasing and sourcing offices in Sweden, China, and Poland– matching well with the location of component supply.

Next, Thorwaldsson discusses what he views as both a challenge and an opportunity: the very fast development of technology in the electronics industry. "We have established four centers of excellence across several countries, one each for electronics, sheet metal, integration, and machining; these centers set the standards for the group."

And when I asked what has helped PartnerTech to compete with much larger contract manufacturers, he gave these three strategies:

- Staying close to the customer (e.g., leveraging Central and Eastern Europe*)
- Using Lean production to eliminate waste in all kinds of processes
- Training 100 managers in leadership programs, including setting and meeting targets and key performance indicators

"Leadership training is very important," says Thorwaldsson. "We go through the whole management structure so everyone is trained in the same way."

NOT ALL SMALL-TO-MID-SIZED COMPANIES HAVE SURVIVED

In contrast to the three companies profiled for this white paper, we've known many small- to-medium-size companies that have not survived. Some companies falter from the industry challenges enumerated by the successful CEOs above. They struggle, downsize, and are liquidated. What differentiates the smaller-sized companies that face the challenges in this tough, ever-changing industry from those that falter? In my experience, it's the CEO and the culture that he or she builds, walks, and rewards.

Other formerly small- to-mid-sized companies jump to the giant players through acquisition. SMS is an example of the latter. I've known and admired SMS Technologies CEO Bob Blumberg for a dozen or so years. Last year Southern California-based SMS was acquired by giant Taiwan-company Kinpo Group, to be managed under Thailand-based Cal-Comp EMS, which generates a few billion dollars annually. In 2009 Cal-Comp and Kinpo evaluated three USA companies, and in the summer of 2010 chose SMS.

THE LAST WORD ON LASTING SUCCESS FOR SMALL-TO-MID-SIZED ELECTRONICS CONTRACT MANUFACTURERS

Perhaps Digicom CEO Mo Ohady speaks for all three CEOs of the successful small- to-mid-sized electronics contract-manufacturing companies we've profiled here when he says, "When executives in this industry prioritize customers and technology, and employees and suppliers above all else, they 'stubbornly' achieve a lasting success—no matter the size of the company."

*For more information on this region, refer to TFI's report Electronics Design and Manufacturing in Central and Eastern Europe

About the Author

Pamela J. Gordon has been tracking the electronics contract manufacturing industry since 1984, when working for McGraw-Hill / DRI subsidiary Gnostic Concepts. Then in 1987 she formed Technology Forecasters Inc., a surviving, thriving consulting and market-research firm serving electronics companies of all sizes around the world. She and her team of 15 consultants and analysts can be reached at info@TechForecasters.com.

About Technology Forecasters Inc. and TFI Supply Chain

Since 1987, clients have turned to Technology Forecasters Inc. for strategic advice and market insights to optimize global manufacturing relationships and achieve profitable environmental strategies. With clients in the Americas, EMEA, and Asia, TFI delivers a unique combination of industry and environmental expertise through management consulting, customized research, keynotes, and workshops. TFI Supply Chain researches and consults on best practices for the electronics industry from supply and manufacturing through logistics. The author invites your comments: pgordon@techforecasters.com.

TECHNOLOGY FORECASTERS INC.
Strategic Supply Chain & Environmental Consulting