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A Special Report from Vital Analysis

What Electronics Tech Buyers Need:
Sector Overview and SYSPRO Case Study

Overview

It takes a lot more than moxie to be an electronics firm. This is an industry that requires deep capital resources, never-ending innovation and a relentless attention to changing markets and competitors. It's also one of the few industries where price deflation is often planned into the design and rollout of products. These are products that don't often remain market relevant for long. It takes a special kind of executive to run an electronics firm: part visionary and part operational excellence zealot. The implications for the systems that support an electronics firm are special, too. These systems must support the operations well while providing the flexibility to work with a changing array of supply chain partners globally.

SYSPRO's offering in the Electronics sector impressed us. It is a broad, deep ERP solution that is targeted at small to medium size businesses. SYSPRO is committed to the electronics sector and has made a number of functional enhancements to its product line to support this vertical. We were also pleased to see the flexible .NET architecture stack that the entire product line utilizes. When this architecture stack is coupled with broad functionality, users gain supply chain flexibility unavailable in other solutions.

The electronics industry is an exceptionally difficult marketplace. It is a highly competitive and capital-intensive industry whose products face rapid obsolescence and unrelenting downward pricing pressure. It is also a highly fragmented vertical.

Four of the largest components of the electronics industry include consumer electronics, semiconductor, RFID/sensors and automotive technologies. Consumer electronics dwarfs most subsectors with the retail component alone accounting for annual sales of $50 billion (USD) (source: Hoovers). There are many other sub-sectors within the electronics space. These include: flat-panel display manufacturers, integrated circuits, nanotechnologies, power supplies, security equipment and connectors to name a few. *Despite the diversity present in this sector, all of the firms within it face many of the same operational and business challenges.*

The electronics business is not for the faint of heart. The research and development (R&D) costs required to bring a new product to market can run into the billions. Even if the new product can be brought to market, the odds of its being a success will likely be short-lived, if at all, given the short life span of new technologies. First mover advantage is key to business and financial success.

There are a myriad of other issues that plague electronics firms. The supply chains that serve these firms are extremely long and complex. For many electronic products, one company may design the product, another company assembles it and hundreds or thousands of firms may supply components or sub-assemblies. All of these parts must arrive exactly on-time with zero defects and match exacting engineering specifications. Delays can ruin a product launch or cause a manufacturer to miss a major sales cycle (e.g., November-December holiday sales). The

Common Business Concerns of Electronics Firms

Rapid Product Obsolescence
- First movers make the lion's share of profits while late comers miss the opportunity to earn high profits and recover R&D costs

Fast Cycle Times
- Firms must be innovative and fast to win

High R&D and Capital Costs
- Costs to develop new products, open new fab shops, etc. are extraordinary

Relentless Downward Price Pressure
- Electronics industry may be only industry that consistently faces continuous price deflation
- Must be operationally excellent at all times to maintain margins

Fierce Competition
- Competitors are often large firms with significant economies of scale

Low Margins
- Manufacturing is being continuously moved to ever-lower cost locales to improve margins
- Margins threatened by currency fluctuations

Complex Supply Chains
- Supply chains are many levels deep and cross many countries

High Cost of Entry
- How can new markets be entered and new products developed in an era of high capital costs?

Overcapacity
- Competitors quickly create additional or excess capacity that adversely affects sector profitability
- Sector can quickly become awash in older, obsolete inventory

Quality Control
- Six Sigma, et.al., is a business requirement

supply chain is a constant source of concern as any disruption causes a cascade of woe. In recent years, fires, pandemic disease, strikes and other phenomena have caused significant product shortages, sales disruptions and lost earnings for electronic firms.

In some management consulting circles, electronics industry clients are being advised to become high performance companies. In the electronics sector, firms have no choice to be anything but high performing firms. The best electronics firms must possess a set of outstanding capabilities to thrive and survive. These capabilities include:

- operational excellence
- a culture for continuous change and disruptive innovation
- ability to adapt to continually changing buyers, governments and markets
- true global operations

Prerequisites for Operational Excellence

To become operationally excellent, electronics firms must possess strong, integrated processes and systems that are functionally rich and tightly integrated. Top-notch systems can support best-in-class processes. But what must these systems support from a business perspective? We believe the key requirements are:

- rapid product development
- quality control
- performance measurements & analytics
- full engineer-to-order product lifecycle management
- timely, accurate cost management

Short product life cycles dictate that electronics firms possess superb supply chains and meticulous product lifecycle management systems. They must have a tight change control discipline that flows up and down the entirety of the supply chain. Every aspect of the engineer-to-sale process must be accounted for and optimized. Supplier quotes and real-time status updates from suppliers and retailers are needed to complete the lifecycle and permit accurate production forecasts. If done well, electronics firms avoid product shortfalls/overages and supply chain disruptions while maximizing sales and margins.

> "*In April, XM and Samsung plan to release their co-branded Helix, going from handshake to store shelves in just nine months. That compares with the 12 to 18 months it typically takes to bring new consumer electronics to market.*"
>
> Source: BusinessWeek, March 27, 2006

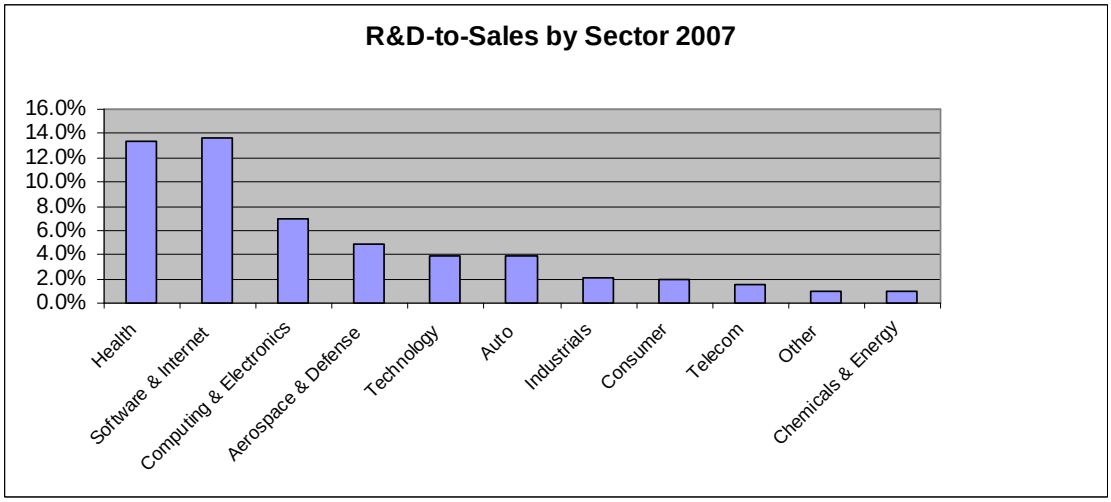
Short product development cycles are the lifeblood of successful electronics firms because the faster a firm can bring new products to market, the better their market share and margins. The key to success here is to be innovative and fast.

Quality control is another major area requiring sophisticated systems. Systems need to test components at every step of production. It isn't enough to just track quality, firms need root cause failure analysis processes to develop corrective actions quickly and avoid damaging public relations, recalls, etc.

Performance measurements and analytics are essential solutions if electronics firms are to accurately monitor product and component pricing as well as the timing of future price and cost reductions. Deflation is so common in the electronics industry that target costing and target pricing are built into the business plans of many new products. Analytics help firms determine whether their current costs and pricing are producing needed margins and helping to recover sunk R&D costs. Smart electronics firms learn from the pricing and costing trends exposed from previous products and from competitors.

Great measurements need strong process controls to ensure end-to-end accountability especially with large capital expenditures, product development efforts and manufacturing processes. Electronics firms will need workflow and governance tools to enhance their odds of meeting targets and highlighting aberrations early.

Strong financial and capital management tools are also needed. Given the significant amounts of capital required to develop new production facilities and products, capital expenditures must be watched quite closely. Electronics firms spend almost twice what other industries do on R&D. Electronics lags only Health and Software firms in R&D spending (see Figure 2).



(Source: Booz Allen Hamilton Global Innovation 1000) Figure 2

The impact of innovation in electronics firms is intense and is only possible due to the significant amounts spent on research and development. Of the top twenty patent recipients of 1994-2007, almost all of the firms were in the electronics industry (see Figure 3).

U.S. Patent Awards - 1994-2007		
Rank	**# of patents**	
1	48,312	IBM
2	35,111	Canon Kabushiki Kaisha
3	29,395	Hitachi, Ltd
4	27,622	Toshiba Corporation
5	26,652	General Electric Company
6	25,586	Matsushita Electric Industrial Co., Ltd.
7	23,709	Sony Corporation
8	21,859	NEC
9	20,649	Samsung Electronics Co., Ltd.
10	20,645	Mitsubishi
11	18,997	Fujitsu Limited
12	18,826	Motorola
13	18,257	Eastman Kodak
14	16,779	Siemens
15	16,252	Fuji Photo Film Co., Ltd
16	15,481	Micron Technology, Inc.
17	14,627	Intel Corporation
18	13,775	Xerox
19	13,718	U.S. Philips
20	13,525	Texas Instruments, Incorporated

Figure 3 – U.S. Patent and Trademark Office

Let's look at how big the R&D budgets are at some of the top global electronics firms in 2007 (see Figure 4):

Firm	R&D Budget	R&D to Sales
Matsushita Electric	$4.850 billion	6.1%
IBM	$6.153 billion	6.2%
Intel	$5.775 billion	15%
Sony	$4.553 billion	5.9%
Nokia	$7.727 billion	11.1%
Samsung Electronics	$6.536 billion	6.2%

Source: Booz Allen Hamilton Global Innovation 1000 – Winter 2008

Figure 4

The last few tables clearly demonstrate that electronics firms need solutions that manage R&D and capital expenditures well. That means these firms must possess great financial, managerial, capital, manufacturing, process and supply chain solutions (to name but a few). What are those solutions?

The Needed ERP Solutions

We believe there are several very important enterprise solution components that electronics firms should demand. Some of these requirements are functional and others architectural or technical. Overall, electronics firms will work best when served by a full-suite, integrated ERP (enterprise resource planning) solution. A full-suite solution will provide a significant degree of controls, back office and front office functionality as well as the all-important shop floor, manufacturing, supply chain management, production scheduling, etc. modules that manufacturers need.

At a minimum, we would recommend any short-listed software vendor must provide the following to be seriously considered for an electronics firm:

- core financials – to help manage capital
- governance, compliance and regulatory – to protect shareholder wealth and avoid governmental sanctions
- electronic data interchange – to communicate effortlessly with a bewildering array of suppliers
- full manufacturing shop floor support – to successfully and quickly get new products made and made well
- supply chain management – to successfully orchestrate the movement of thousands of parts to appropriate final assembly and retailing locations
- trade promotions management – to manage financial results as well as retailers, advertisers, trading partners and others
- lot traceability – to monitor performance of suppliers and to facilitate recalls, engineering changes and more
- quality control support – to minimize reverse logistics, warranty and other costs
- full international support – to collaborate, co-ordinate, compensate and communicate with scores of customers, suppliers and other constituencies

The international support item is a key one as the typical electronics product today will contain parts sourced from numerous countries. The business systems that an electronics firm uses must support cross border collaboration, bill paying, supply chain management, etc. If the software cannot handle multiple languages (including double byte characters) and currencies, it will be inadequate to the tasks asked of it.

The Global Electronics Industry

"In 2003, Asia accounted for 43% of world high-technology exports, up from 33% in 1990."

Source: National Science Foundation, May 2007

In the solution architecture area, we believe that electronics firms should choose ERP products with a SOA (services oriented architecture) platform as the underpinnings of the product line. This is a must-have requirement as electronics firms must be able to connect their systems to those of all of their supply chain (and value chain) partners. This connectivity is crucial to communicating accurate engineering specifications, order information, sales/production forecasts and more.

But the SOA platform takes on additional importance in the electronics industry as the number of partners can be extraordinary given the number of components found in an electronic product and the total number of products an electronics firm will produce. Moreover, the rate of product introductions and retirements within an electronics firm is so great that a firm must have a technical architecture that permits easy, fast connections to thousands of partners. Finally, the frequent, rapid changes in technology mean that new suppliers in new or lower cost countries must be continuously added to the system. Without a flexible architecture, the cost and time required to make these frequent connections would be excessive.

The bottom line is that SOA enables collaborative supply chains, inter-country collaboration, CPFR (collaborative planning, forecasting and replenishment).

SYSPRO Alignment in Electronics

We have been briefed on SYSPRO's vertical solution for electronics manufacturers and distributors. SYSPRO possesses a relatively complete ERP product line that is suitable for most discrete manufacturers. Moreover, it appears to be quite relevant for Electronics manufacturers (see sidebar).

In 2007, SYSPRO added new functionality for e-signatures, returned merchandise authorization processing and return-to-vendor applications.

Based on criteria previously covered in this paper, we believe SYSPRO's solutions represent viable, logical, long-term solutions for electronics firms. Specifically, we believe the solutions offer users peace of mind as they meet with most operational and regulatory requirements. Specifically, we believe their proprietary EDI (electronic data interchange) solution would get quite a workout within many electronics industry users. We also believe that consumer electronics firms would benefit from an ERP solution that also contains a trade promotions management solution. While retailers and consumer products manufacturers utilize this technology, we believe more electronics firms should be taking advantage of such technology if they want to achieve their targeted margins.

Key Modules

Manufacturing

- Engineering Change Control
- Work in Progress
- Lot Traceability
- Quotation/Estimating
- Projects and Contracts
- Factory Scheduling
- Bill of Materials
- Requirements Planning
- Electronic Data Interchange

Financials

- General Ledger
- Accounts Payable
- Fixed Assets
- Accounts Receivable
- Cash Book
- Activity-Based Costing
- Electronic Funds Transfer

Distribution

- Inventory Control
- Sales Orders/Invoicing
- Purchase Orders
- Sales Analysis
- Landed Cost Tracking
- Counter Sales
- Forecasting & Inventory Optimization
- Product Configurator
- Blankets Sales Orders & Releases
- Return Merchandise Authorization
- Return to Vendor
- Trade Promotions

Analytics

CRM

SYSPRO also possesses regulatory compliance functionality that may come in handy for smaller electronics firms that hope to go public or be acquired by a larger, publicly traded firm. The software supports Sarbanes-Oxley and other requirements out of the box.

When we spoke with an electronics industry SYSPRO user, he indicated that his firm benefits significantly from the tight manufacturing and back office integration within the suite. This customer indicated that they are using about 80-90% of the core applications offered by SYSPRO and are attempting to activate two more modules. This customer specifically called out the Finance, Manufacturing, Lot Traceability and RMA modules as being of particular value to his niche electronics firm. This customer also confirmed the importance of pre-supplied integration within the product suite.

Product functionality is only one part of the story though. The technology architecture that SYSPRO utilizes is a multilayered, .NET stack that provides significant connectivity and product flexibility. This is critical for electronics makers that need to interact with third parties and their systems. This is also significant in that it permits the integration of non-SYSPRO technologies should those be required.

Given the size of the company and the successes it has secured already in the space, we believe SYSPRO should be on the short list of many electronics technology selections.

Who is SYSPRO?

SYSPRO (www.syspro.com) was launched approximately 30 years ago. Their software products are in use in over 60 countries today. Total customer count for SYSPRO exceeds 14,000.

SYSPRO offers cross industry solutions (e.g., financial applications) as well as distinct solutions for several vertical sectors. Some of the other verticals that SYSPRO supports include: aerospace, automotive, chemicals, machinery and equipment manufacturing, medical devices, food and beverage and services.

SYSPRO products are targeted for the small to midsize business market. These applications are sold directly by SYSPRO or through authorized resellers.

Summary

SYSPRO believes that its users are "pragmatic visionaries". These are users who shop carefully for their technology solutions (i.e., pragmatic) and buy from vendors with an established track record for delivering complete vertical solutions that flex and grow at the point of need and when business requirements change (i.e., visionary). Using that definition, we believe a significant number of electronics executives would fall in this category.

Truth be told, we would find it hard to categorize any electronics firm as anything but a pragmatic visionary. If they were not pragmatic, they would quickly exhaust their capital

lines and go out of business. Likewise, if they were not visionary, their products would fail to capture the interest of a very transitory, fickle technology buyer. There are no risk-adverse, safe or boring electronics firms. If an electronics provider tried to be one, they, too, would be out of business soon as their offerings would be out of favor with a dynamic and ever-changing market.

Electronic firms must choose well when buying new application software. They need software that does the needed functions (i.e., the pragmatic parts) but they also need a solution that bends, flexes and adapts to the chaotic, global business environment they operate within. The latter requirement mandates a solution that works constantly in changing business strategies (i.e., the visionary part). Make sure any solution you buy satisfies both requirements well.

About Vital Analysis

Vital Analysis is a very different kind of technology research organization. We are the intersection set where exceptional technology market knowledge meets the executive suite. Where other 'analysts' replay vendor press releases, we give you the:

- impact new technologies will or won't have on your business
- reasons why you should or shouldn't care about specific emerging solutions
- business justifications why you may or may not want specific solutions

Vital Analysis was carved out of TechVentive, Inc. in 2007 as a new, but complementary business. As designed, Vital Analysis is the publishing, research and analytical arm of that company.

Our reach, like our blog readership, is truly global. We've consulted with top technology executives in Australia, Brazil, Canada, United Kingdom and the United States. We've been briefed by technology providers from virtually every corner of the planet.

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