



2010 State of the VME Technology Industry



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by: Ray Alderman, Executive Director, VITA

This report provides the reader with updates on the state of the VME Technology industry in particular and of the board industry in general, from the perspective of Ray Alderman, the executive director of VITA. VITA is the trade association dedicated to fostering American National Standards Institute (ANSI) accredited, open system architectures in critical embedded system applications. The entire series of reports can be found at www.vita.com/mktoverview.html.

Business Conditions

There were no tears shed when we said good-bye to 2009. It was probably the toughest year in the history of this business. Three major market segments (telecom, industrial, and medical) all showed declines in sales of board-level products ranging from 70% to over 30%, respectively. The bright segment last year was MIL/Aero, with gains for many vendors who focus on and target that market. There's no good reason to rehash the carnage from last year, so let's focus and concentrate on 2010 and the promise of opportunity.

From all reports I have read, the economic forecast is for a slow and incremental improvement in business conditions worldwide. Some segments will improve more rapidly than others. Telecom seems to have the most continuing problems and the least probability for improvement, it may actually see another year of decline. Industrial segment sales may improve, but that market is terribly fragmented across form factors and the margins will remain low for suppliers because there are so many competitors selling commodity-oriented motherboards and small form factor products. Plus, consumer spending must increase before capital expenditures resume. The medical equipment markets are still unsure about the effects of the health care reforms in the US, so demand will still be depressed until more is known from Congress, and right now the efforts appear to be stalling out.

The MIL/Aero segment is stable, but there are concerns. The Obama initiative for procurement reform of DoD purchases has slowed the issuance of new contracts, both large and small. The attempted bombing of a US airliner (Amsterdam to Detroit on Christmas Day) may move DoD budget money to new security equipment and personnel at airports (both in the US and in other developed countries). The Obama administration has stated that the Homeland Security budget is off-limits to cuts.

President Hugo Chavez of Venezuela claims that the US is flying so many UAVs (unmanned aerial vehicles) over his country, spying on his military installations, that they block-out

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the sun on certain days. "I've ordered them to be shot down," Mr. Chavez said of the aircraft. "We cannot permit this."¹ So, the UAV market looks very good for 2010 (depending on his army's aim). Numerous countries with untrustworthy neighbors are buying UAVs to keep track of their borders and their unfriendly neighbor's activities. Both Pakistan and Iran are politically unstable these days, requiring more aerial intelligence gathering and tracking. Yemen is heating-up as a new terrorist haven, needing more monitoring by the US and Yemen's neighbors.

We have seen money poured into the "smart grid" effort in the power industry recently (\$3.4 billion allocated in the US). That's part of the industrial market segment, and this initiative may be their market stabilizer in 2010. Also, we have seen some orders placed for upgrades to the Air Traffic Control System (ATCS). But the equipment going into the ATCS operates in air conditioned protected rooms, so that equipment only needs to meet normal Information Technology (IT) computer room requirements, not the extended temperature and shock/vibration requirements of the MIL/Aero segment. I lump these sales into the industrial segment since it can be done with motherboards and small form factor computers.

2010 will be a year of stabilization in our industry, not growth. This will apply across all industry segments, including MIL/Aero, although MIL/Aero weathered the storm better than any other segment. In all segments, growth will be spotty and unevenly distributed (depending on which company gets one of the few available orders).

We will see the technology transitions of 2009 continue: from general purpose processor chips to DSPs, from processor and I/O chips to FPGAs, from backplane-based systems to stacked racks of 1U boxes, from parallel buses to serial fabric interconnections. We will also see initiatives to standardize new system and subsystem buses.²

"2010 will be a year of stabilization in our industry, not growth."

The last half of 2009 showed no merger or acquisition activity in our industry. It may pick up again in 2010, depending on the financial liquidity available. A lot of companies are looking to buy companies with unique and advanced products in promising market segments. 2010 will be an interesting year as we stabilize, analyze the best segments for opportunities, assess the promising new technologies, and make strategic decisions as the year progresses.

Transitions

There are a number of transitions ongoing in our markets. They will continue into 2010 and beyond revealing a macro-level perception of what to anticipate in the future:

The transition from backplane-based systems to networked modules

For many years, the markets for backplane-based computing systems have been diminishing. The old industrial applications that used STD bus, VMEbus, Multibus, and PCI bus architectures have been moving to non-backplane implementations. Multiple small form factor specifications and motherboards, interconnected by Ethernet or some other network connection, have fragmented these markets and taken over these segments. Most of these applications are simple sequencers and users of these systems are looking for the cheapest processing cycles they can buy. These applications have a small number of simple I/O interfaces, do not push the performance curve, and have no highly specialized requirements (extended temperature operation, severe shock and vibration tolerance, or high MTBF).

The medical industry moved from backplane-based systems to motherboards in 1U boxes in the past few years. Medical equipment is typically housed in air conditioned rooms, with no hostile environment requirements. Medical equipment environments can be met with commercial IT computer room standards. Consequently, medical

How long can backplanes hold out?

The demise of backplane-based computing systems has long been predicted, but the horizon is now coming into view. For the past decade or more, we have seen one embedded board segment after another drop backplane-based computer systems and move to interconnected motherboards, small form factor boards or little computing boxes.

For more of Ray's comments on this topic, visit www.oareview.com/?p=2626

¹ "Hugo Chavez orders military to shoot at US aircraft," Telegraph.co.uk, December 20, 2009, URL: www.telegraph.co.uk/news/worldnews/southamerica/venezuela/6853836/Hugo-Chavez-orders-military-to-shoot-at-US-aircraft.html

² Ray Alderman, "New interface designs are taking off," Open Architecture Review, January 2010, URL: www.oareview.com/?p=2632

equipment markets adopt basic IT equipment specifications and they also buy the least expensive computer cycles they can find in the market.

The telecom industry continues to use backplane-based systems, but the market is crowded with suppliers, demand for telecom systems is soft, and many systems only need to meet commercial IT standards. Most telecom backplanes are simply connections to PC/server motherboards through a backplane. There are no significant environmental or reliability specifications to meet (NEBS is a less stringent specification than many MIL specifications, only slightly tougher than conventional IT standards). I anticipate that telecom will also move away from backplane-based systems, in the future, to stacked 1U motherboard boxes in a rack. This could occur when the telecoms adopt a pure TCP/IP model for communications.

Data centers are beginning to move away from blade servers and backplane-based systems to rack-mount 1U motherboard boxes stacked-up in 19-inch cabinets and connected with high-speed network connections. Blade server backplanes are mostly proprietary from Dell, HP and IBM. Data centers also buy the cheapest compute cycles they can find in the marketplace. As with the other segments, the equipment only needs to meet the basic IT specifications for environmental conditions since they are in protected air conditioned rooms.

Other than some legacy demand in these segments, the primary remaining market requiring backplane-based systems is MIL/Aero. Most applications have severe environmental requirements, the systems are small and space-constricted, typically cannot use redundancy (as you can in telecom and data centers), constantly push the performance envelope, have very high MTBF requirements, and maintenance requirements (2-level maintenance) that drive this equipment to backplane-based architectures.

The military's transition to networked modules is seen in two new efforts, the plug-and-play satellite bus³ and a new avionics instruments bus. Both are just glorified wiring harness standards connecting the LRUs. In the case of the plug-and-play satellite bus, the Air Force is hoping to eventually be able to build satellites in a day. They are focused on a systems-level architecture that provides an interface for spacecraft components through a TCP/IP compliant router with a standard power interface. The concept is similar to connecting devices together with a USB interface on a PC.

As we go into 2010, we will continue to see demand for backplane-based computing systems diminish, except in MIL/Aero. Even the implementation of Line Replaceable Units (LRUs) requires a backplane, inside the LRU, in the present MIL/Aero platforms at this stage.

The transition from General Processor Units to DSPs

For a number of years, we have seen applications in consumer devices, telecom, and the military transition from general processor units to DSPs (Digital Signal Processors). A larger percentage of the processing load in these applications require DSP functions that the general processor units do not support.

Communications protocols, sensor data processing, security processing and video processing are driving this trend.

The transition from DSP chips to DSP cores in FPGAs

As general processor units have given up market share to DSPs, generic DSP chips have given up market share in the past few years to DSP cores running in FPGA chips. The MIL/Aero segment led this trend initially, but telecom applications (macrocell, picocell, and femtocell) are now adopting FPGA-based DSP implementations and abandoning generic DSPs. This trend will speed-up as the wireless networks upgrade 3G capability and communications networks build-out to LTE.

³ Michael Cooney, "Air Force extends plug-and-play spacecraft," NetworkWorld - Layer 8, December 4, 2009, URL: www.networkworld.com/community/node/48766

FMCs

The FPGA Mezzanine Card (FMC) specification plays right into the transition from DSP chips to DSP cores in FPGAs.

This standard describes a new small form factor I/O mezzanine card that can be connected to all leading carrier board form factors. It assumes that FMCs connect to an FPGA device or other device with reconfigurable I/O capability.

The purpose of this standard is to create an I/O mezzanine module which works intimately with an FPGA processing device and minimizes the handling and formatting of the transceived data.

The standard describes FMC I/O modules and introduces an electro-mechanical standard that creates a low overhead bridge between front panel I/O, on the mezzanine module, and an FPGA processing device on the carrier card, which accepts the mezzanine module.

For more information, visit www.vita.com/fmc.html

The transition from copper to optical connections

As we approach 10G data rates, running electronic signals for any distance (more than a few inches) on copper becomes problematic. As the data centers move away from copper backplane-based systems to stacked rack-mount 1U motherboard boxes, they also move to optical connections (at up to 40G today) to network them together. Data centers have massive amounts of re-cabling to do with every increase in copper cable speeds. With optical connections, the optical fiber cabling can stay in place and handle the next speed transition (from 10G to 40G) without rewiring the facility. In the next 3-4 years, we will see optical connections replace copper as we continue to increase data transmission speeds in military, telecom, medical, and some industrial applications. As this transition occurs, we will see increased adoption of LRU specifications in military applications. At that point, the optically interconnected LRUs will create an architecture similar to the optically-connected 1U server boxes in the data center, only on a smaller scale. When this occurs, the military market for backplane-based systems will decline.

The transitions of business model for board vendors

We have already seen some board companies adopt the high-volume/low-margin business models in the last ten years. This started with the board and system suppliers to the telecom industry. In the past few years, companies in the industrial segments have also adopted this model: Kontron, RadiSys, ADLink, and Advantech are examples. The underlying technologies fueling this transition are small form factor and motherboard-based product lines.

When customers for these commodity products increase the number of units they purchase, it attracts CEMs (Contract Electronics Manufacturers). It has been said for years that the biggest threats to the board business are the CEMs and that limits the growth of any board company. CEM gross profit margins (GPM) are 8% or less, according to their financial statements. CEMs have added design services that bring them to parity with the board makers. To remain competitive in such an environment, a board company must adopt the CEM business model.

Kontron made this move in March of 2008 when they formed a joint-venture with Quanta Computer, a Taiwanese CEM.⁴ As this agreement progresses, it will give Kontron cost and volume advantages over RadiSys, ADLink, and Advantech. Ulrich Gehrman, chief of the executive board of Kontron and my old friend and previous boss at PEP, understands this business model transition for board vendors in the high volume/low margin segment and has moved his company to this model.

The primary threat to the high-volume/low-margin business model (products based on blades, motherboards, and small form factor boards) could be patent assertions. Most of these products are based on PC technology and designs. In 2009, numerous patent assertions were made against the IT (Information Technology) equipment makers concerning those designs.⁵ When the patent holder is done with the primary makers of these products, they may set their sights on the high-volume embedded board makers. As of the publication date of this report, the case is still pending.

The transition from board business to system business

Another change that has been occurring is the transition from the board business to the systems business. The first place I remember seeing this was in MIL/Aero, as vendors vertically integrated PMC products, packaging/chassis and backplane products into their offerings. Mercury Computer Systems was one of the first, in my opinion, to become a systems vendor in the MIL/COTS segment with their Race and Race++ system-level product lines. The CompactPCI, MicroTCA, and AdvancedTCA vendors did the same thing: they vertically integrated mezzanine boards, packaging/

Moving to optical connections at light speed

For the past twenty years, we have been only three years away from optical backplanes and architectures taking over the computing industry. And for those twenty years, it never happened. Like the perpetuation of Moore's Law, the signal engineers made Megahertz and Gigahertz signals run effectively on copper wires and copper connectors. But, as Moore's Law nears the end of its ability to double the number on transistors in a given space on a die, copper may be nearing the end of its ability to reliably pass signals at higher frequencies.

For the rest of Ray's comments on this topic, visit www.oareview.com/?page_id=2165

4 Kontron, "Kontron AG founds joint-venture with Quanta Computer Inc. of Taiwan," press release, March 6, 2008, URL: us.kontron.com/about-kontron/news-events/kontron+ag+founds+jointventure+with+quanta+computer+inc+of+taiwan.2629.html

5 Federal District Court Filings & Dockets, "ACQIS LLC v. Appro International, Inc. et al," April 2, 2009, URL: dockets.justia.com/docket/court-txedce/case_no-6:2009cv00148/case_id-115302

chassis products, and backplanes into their offerings and became system vendors to the telecom industry. The VPX vendors seem to be following the same path at this point, to systems-level product offerings. This transition could indicate that the number of backplane-based computing systems is stable and possibly growing instead of declining. The backplane and packaging business served by the traditional vendors has been vertically integrated into many board companies as they become systems vendors.

Other than a few volume system-product orders in the telecom industry that came in before the crash in 2006, the overall volume of systems-level shipments is low. The system backplane/packaging/power supply are customized in most products. Such conditions have few economies of scale for the systems builders and raises their overall costs, especially with unit volumes low, and backplanes and power solutions requiring customization.

“What options do the traditional backplane/packaging vendors have?”

What options do the traditional backplane/packaging vendors have?

- 1. Backplane/packaging vendors can form strategic supplier alliances with the systems builders to build the needed products for the low-volume and diverse product requirements of the present low-volume systems-level market. I have seen two examples of such alliances develop in the past year.*
- 2. Backplane and packaging vendors can buy board vendors (like the Carlo Gavazzi-Mupac acquisition of Aurora in 1998) and vertically integrate into the board/systems business. The board/systems business is a different model from packaging and backplanes, requiring a different level of design, marketing, sales, and general management. This strategy could work best in commodity segments like telecom, medical, and some industrial markets.*
- 3. Backplane and packaging vendors can get into systems integration business (Elma bought ACT/Technico in 2009). The systems integration business is labor-intensive, with margins in the 20% plus range. The volumes associated with being a pure systems integrator are low since the primary system vendors demand account and product quality control of any customer using significant volumes.*

Most of the packaging vendors already offer cabinet-based products, for stacking multiple 1U boxes and cooling the system. Their products are similar to what HP and IBM offer to their IT customers: a 19-inch cabinet, with liquid cooling capabilities for data centers (much like a refrigerator).⁶ These racks typically sell for about \$1 per watt of cooling capacity (30 KW equals about \$30,000 cost). But again, the IT vendors have vertically-integrated cabinet and cooling capabilities built into their product lines.

If you look at the plug-and-play satellite bus and the new avionics bus from the US Navy and Honeywell, traditional packaging/backplane vendors could design and build the metal superstructure that holds the LRUs together; wire-up the data, power, and control wiring harnesses; and deliver that wired-up superstructure as a subsystem to satellite and airframe vendors. As more platforms adopt the LRU model, opportunities will surface to design and deliver these wired-up metal superstructures as an extension to the present 19-inch cabinet product lines of traditional vendors. They can also build and supply the LRU containers (with internal backplanes, power supplies, and special cooling capabilities) to the systems vendors. I don't see that the board/system vendors have much interest (or expertise) in this area.

⁶ “HP Modular Cooling System: water cooling technology for high-density server installations”, HP, URL: h20000.www2.hp.com/bc/docs/support/SupportManual/c00600082/c00600082.pdf

Markets

MIL/Aero

VDC Research has released a report titled “Embedded COTS Systems in Military, Aerospace and Defense Applications.”⁷ The multi-volume study provides an in-depth analysis of North American and Western European market demand for embedded COTS boards and systems. They mention that VME will remain the dominant architecture in the embedded COTS board market for a very long time, especially with the introduction of VPX. However, they point out that COTS suppliers should be aware of two trends impacting this market.

- *The increasing demand from customers to purchase fully integrated COTS systems rather than board-level products for internal integration.*
- *The end-user demand for the smallest and lowest power compute platform possible.*

They go on to warn COTS board suppliers that they should not be trying to sell single board computers simply because that is what they have, but that the suppliers should be aware of the need for small form factors and new flexible solutions in systems configurations. The results of the research seem to indicate that a system-level solution has become very important to customers, playing well into the VPX solutions.

Bishop & Associates has published a report on the Rotorcraft/Helicopter Sector.⁸ It forecasts a bright outlook for 2010 in this sector as orders for helicopters are predicated to be strong. Many new helicopters are being developed, and many older ones are programmed for updates and rebuilds, leaving a lot of room for critical embedded systems.

Smart Grids

In October of 2009, the US Department of Energy awarded \$3.4 billion in grants for the Smart Grid as part of the economic stimulus plan. This is mostly aimed at putting smart meters on 13% of all US homes over the next three years. How much demand exists for microcontroller board products for the system is unclear.⁹ The grants do cover the automation of 700 subsystems and 850 transmission centers, so the prospects for the use of controller boards looks promising.¹⁰

Telecom

2009 was a devastating year for the telecom board segment, even worse than the disastrous conditions in 2008. One source claims that just in the 3G wireless segment, over 450,000 layoffs were announced last year.¹¹ After laying off 30,000 to 40,000 of their workers at each company in 2009, AT&T is considered the next GM, and Verizon looks like the next Chrysler.¹² Both are seeing free cashflows decline, growth slowing, costs rising, and ongoing pension and healthcare costs dwarfing the huge liabilities that bankrupted the US auto industry. Verizon recently announced they will dump 13,000

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7 Eric Guilliksen and Eric Heikkila, “Embedded COTS Systems in Military, Aerospace and Defense Applications,” VDC Research, March 6, 2008, URL: www.vdcresearch.com/market_research/embedded_hardware/product_detail.aspx?productid=2114

8 Scott W. Clay, “Flying High: The 2010 Outlook is Bright for the Rotorcraft/Helicopter Sector,” Bishop & Associates Inc, 2010, URL: www.connectorsupplier.com/tech_updates_Clay_Military_2010_Outlook_1-19-10.htm

9 Jeff St. John, “DOE’s \$3.4B Smart Grid Grant Program: The Winners,” greentechgrid, October 27, 2009, URL: www.greentechmedia.com/articles/read/does-3.4b-smart-grid-grant-program-the-winners

10 Rick Merritt, “U.S. awards \$3.4 billion in smart grid grants,” EE Times, October 27, 2009, URL: www.eetimes.com/showArticle.jhtml?jsessionid=0PSERF10RKRJDQE1GHOSKHWATMY32JVN?articleID=220900617

11 Petri Possi, “Telecom Layoffs”, UMTS World, April 2, 2009, URL: www.umtsworld.com/industry/layoffs.htm

12 Richard Martin, “Who Cares If Landlines Vanish?”, VON Email Newsletter, August 18, 2009, URL: www.von.com/blogs/martin/blogdefault.aspx?m=art&a=who-cares-if-landlines-vanish.html

people in 2010.¹³ The new year is bringing another round of cuts in the telecom industry according to the VON layoff tracker.¹⁴

Furthermore, the data-hungry 3G phones sold by AT&T are regularly crashing their network.¹⁵ Some estimate that AT&T must spend \$18 billion for new equipment to support the bandwidth needs of the 3G phones and keep the network from crashing, while they can only see about \$6 billion in overall revenue for the company. That says that AT&T could be bankrupt in 24-36 months.¹⁶

Even the French are in a panic! The leadership of France Telecom is under transition as the CEO, Didier Lombard, recently resigned.¹⁷ France Telecom has been experiencing an employee suicide crisis as employees struggle with the American-style restructuring that the state-owned France Telecom has been experiencing. This shuffling of leadership and employee stress only serves to strengthen my position that the telecom industry is under tremendous strain as it seeks to meet the world's insatiable desire for bigger, better, and faster communications.

The rollout of 3G LTE is now under full steam. 3G Americas, LLC has issued a 240 page white paper, 3GPP Mobile Broadband Innovation Path to 4G, that provides an in-depth examination of 3GPP technology standards from a technical, business and applications standpoint.¹⁸ The service providers are struggling as the wireless subscribers now outnumber the wire subscribers by more than 2 to 1 in markets around the world. They are caught in a bind between rapidly changing and costly infrastructures that are needed to support the rapidly growing demands for the new 3G wireless data services and the cost cutting efforts through layoffs that are needed to keep them profitable.

The service providers are aggressively trying to persuade subscribers to flip providers because the pool of new subscribers has diminished greatly. To get these subscribers to switch, the service providers have gone through another round of rate reductions, giving you more minutes or megabytes for less money. The death spiral continues as they need to spend more for infrastructure but see declining revenues as they reduce prices to capture more subscribers. The infrastructure suppliers, board suppliers in our case, suffer under the tremendous pressure from the service providers to reduce their prices. It is somewhat reminiscent of the automotive industry in its heyday as auto makers squeezed every single penny out of their supplies and now find themselves in a supplier vacuum as they have sucked the life out of the supply chain.

To top off the round of bad news, the organizers of the SUPERCOMM conference confirmed that the 2010 show slated for Chicago has been cancelled.¹⁹

Mergers & Acquisitions

There was no M&A activity in the second half of 2009 involving board companies. Lower product demand in many market segments, financial turmoil, and economic uncertainty dampened any interest in selling or acquiring companies.

13 "Like Having a Job at Verizon? Too Bad", VON, January 26, 2010, URL: www.von.com/news/like-having-a-job-at-verizon-too-bad.html

14 "Telecom Industry Layoff Tracker: 16,900 Jobs Lost in January", VON, January 28, 2010, URL: www.von.com/articles/financial-news/telecom-industry-layoff-tracker-16900-jobs.html

15 Manish Singh, "Wireless Bandwidth: Make Users Pay?", VON Email Newsletter, September 8, 2009, URL: www.von.com/articles/wireless-bandwidth-make-users-pay.html

16 Reed's Bankruptcy Attorney Blog, "More Job Losses — Now It's AT&T", A&L, December 8, 2009, URL: www.allmandandlee.com/bankruptcy_blog/job_loss_unemployment/more-job-losses-now-its-att

17 "France Telecom Suicides Spur CEO Resignation At Last", VON, February 2, 2010, URL: www.von.com/news/france-telecom-suicides-spur-ceo-resignation.html

18 "3G Americas Publishes Renowned Report on HSPA+, LTE and LTE-Advanced Wireless Standards", 3G Americas LLC, February 4, 2010, URL: www.3gamericas.org/index.cfm?fuseaction=pressreleasedisplay&pressreleaseid=2638

19 Richard Martin, "SUPERCOMM Show Shelved For 2010", VON, February 8, 2010, URL: www.von.com/news/supercomm-show-shelved-for-2010.html

Processor suppliers in our supply chain did have some modest M&A activity. In the first half of 2009 processor maker Intel bought Wind River Systems, the leading supplier of embedded tools and kernels to our industry.²⁰ Intel paid \$884 million for \$360 million in WRS sales or 2.46 times sales. In November of 2009, processor vendor Cavium Networks bought MontaVista Software for \$50 million on \$30 million in sales or 1.67 times sales.

In comparison, Harmon bought QNX for about 5 times sales in 2005. So, the price of embedded software companies is declining. That may be directly related to the increased adoption of free Linux distributions over pricey proprietary kernel royalties.

More interesting here is that both Intel and Cavium Networks are processor vendors integrating operating system and software development tool chains into their product lines. Both these transactions cause concern for board vendors with investments in MontaVista Linux or in VxWorks. Will the other processor vendors (Freescale, IBM, ARM, etc.) trust a competitor to manage the ports to their new processors? I have doubts that these processor vendors will work with Cavium Networks or Intel on ports in the future.

It should be noted that Linux is a common theme in these acquisitions, further strengthening Linux as a lead contender for embedded real-time applications.

For 2010, I believe that M&A activity in our industry will remain depressed. There could be some “fire sales” of product lines from companies leaving certain market segments. The concerns about the future defense budgets (2011 and beyond) may also depress any M&A activity in the MIL/Aero segment due to uncertainty. Mil/Aero has been the most active segment for M&A for the past decade.

GE and Fanuc broke off their engagement late last year but now it is rumored that GE may be eyeing a bid for Rockwell Automation.²¹ The Fanuc joint venture was an attempt to get GE into industrial business segments but with a full on acquisition of Rockwell Automation, GE could have a very serious entry into the segment. GE Intelligent Platforms is a business group made up of several acquisitions in our space; Total Control Products, CimWorks, DataViews Corporation, AFE Technologies, Computer Dynamics, VMIC, Intellution, SBS, Condor and Radstone just to name a few of their acquisitions over the past years. Rockwell Automation would be a great addition to this list.

Lower product demand in many market segments, financial turmoil, and economic uncertainty dampened any interest in selling or acquiring companies.

Parent	Target	Market Focus	Date
Kontron	Thales Computer	MIL/Aero	January 2008
Curtiss-Wright	Pentland Systems	MIL/Aero	February 2008
Adlink Technology	Ampro Computer	Industrial control	March 2008
Interconnect Systems Inc.	Nallatech	MIL/Aero	May 2008
Finmechanica	DRS	MIL/Aero	May 2008
Curtiss-Wright	VMETRO	MIL/Aero	August 2008
Kontron	Intel rack mount server group	Telecom	October 2008
Elma	ACT/Technico	System integration	January 2009
SIE	Carlo Gavazzi-Mupac	Packaging	April 2009
IDT	Tundra Semiconductor	RapidIO chipsets	April 2009
Intel	Wind River Systems	Embedded	July 2009
Mentor Graphics	Embedded Alley	Linux	July 2009
Cavium Networks	MontaVista Software	Linux	November 2009

²⁰ Agam Shah, “Intel buys Wind River to push Linux”, Computerworld, June 4, 2009, URL: www.computerworld.com/s/article/9133981/Intel_buys_Wind_River_to_push_Linux

²¹ Paul Glader, “Is GE Eyeing a Bid For Rockwell Automation?”, Wall Street Journal - Blogs, December 15, 2009, URL: blogs.wsj.com/deals/2009/12/15/is-ge-eyeing-an-853-billion-rockwell-automation-deal/?blog_id=6&post_id=18332

Ex Ante Update

In 2007 VITA adopted ex ante (before the completion) patent disclosure policies in our VSO standards group. At the time, I stated that “Others will follow us and adopt similar patent policies in the US, in Europe, and elsewhere around the world.” I have been working with Chinese standards people on adopting ex ante for years. As you probably know, I took our VITA ex ante processes and procedures to the European Directorate General/Competition (DG/COMP) — similar to our FTC and DOJ anti-trust groups, about 3 years ago. On October 15 of 2009, Neelie Kroes, the European Commissioner for Competition Policy, DG/COMP, addressed the Harvard Club of Belgium with the speech “Setting the standards high.”²² In the speech, Kroes endorsed approving ex ante mandatory patent disclosures for EU standards developers (i.e., they do not violate anti-trust rules), and proposed that they be adopted. If you remember, I took our procedures to the USDOJ and they also approved them with a Business Review Letter stating that ex ante processes do not violate anti-trust regulations.

A lot of large companies went against VITA when we proposed and gained approval of our ex ante processes (both at ANSI and at the US Department of Justice). We were the first organization in the world to implement ex ante processes and I have sent reports to the US Department of Justice, US Federal Trade Commission, and the European Union Commission on our use and experience with ex ante. Now, the EU and other countries are proposing adoption of ex-ante policies and processes similar to VITA's. Kroes claims that it is now imperative that standards processes be open and transparent, that “ambush” and game playing with patents be eliminated, and that the standards process be a level playing field for all the participants. I could have told her that 3 years ago.

Summary

2010 will be a mix of opportunity and uncertainty across our industry. Along with the list of transitions listed previously, we will see transitions in business models and market focus in 2010 for the some players in the board business. The declining fortunes of the telecom service providers and telecom equipment makers should cause companies with products in that segment to refocus on other market segments with more promising opportunities and higher margins. Same goes for companies with large footprints in the industrial and medical market segments if business conditions remain depressed in the first half of 2010.

2010 will be difficult for any company seeking large volume orders, with the possible exception of those companies with CEM business models. Those companies with high-volume/low-margin growth strategies will seek volume orders based on price, making market conditions hyper-competitive in the commodity segments.

The focus in 2010, for all board vendors, should be on raising their margins. Each company should evaluate what percentage of their total sales come from which market segments (i.e., telecom, industrial, medical, military, commercial, etc). Secondly, they should look at the products and technologies they sell to those segments. And finally, they should evaluate what percentage of their margins (i.e., profits) come from which market segments and from what specific products/technologies. Only when they use these market/product/margin maps can they tell where they are now and where they need to focus in 2010.

Vendors must develop and sell more profitable products to more promising market segments this year. The technique of raising margins by cutting costs has nearly played-out. Every vendor in this business will be hit with rising costs as the year unfolds. The cost of components, aluminum, copper, gold, medical insurance, benefits, interest rates, and

²² Neelie Kroes, “Setting the standards high”, EUROPA, October 15, 2009, URL: europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/09/475&format=HTML&aged=0&language=EN&guiLanguage=en

Wind River becomes Intel. Watch out below!

The question of why Intel bought Wind River Systems has come across my desk numerous times since the acquisition announcement back in June '09. My desk is also littered with all the theories suggested for why this event occurred . . .

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MontaVista and the binary ties that bind

On Nov. 11, Cavium Networks announced its acquisition of MontaVista Software, an event the open-source community might see as just as frightening, albeit at smaller levels. Now, the MontaVista brand has just as great a chance of standing as a separate entity as the Wind River brand (Good? Next to nil?), so the acquisition itself is not a cause for alarm. It's just that M&A deals like these show that many corporations still do not grasp the necessary elements that must be preserved for open systems to work on both hardware and software levels . . .

www.oareview.com/?p=2615

For the rest of the story, visit Open Architecture Review.

taxes will probably rise in the coming year. General economic forecasts call for a slow and incremental improvement in business conditions in 2010. Some segments (like telecom) may see further declines in sales this year as the telecom service providers continue to self-destruct. The medical equipment market will not resume normal activity until the financial implications of healthcare reform are understood. The demand for industrial control systems will not fully resume until consumers begin spending money.

In previous reports, I claimed that we were enduring three interrelated problems in 2009: (1) a financial crisis, (2) an economic crisis, and (3) a political crisis. The financial/banking crisis seems to be resolved and the banks are more stable now (with billions of tax dollars in their coffers to keep them solvent). The economic crisis is still with us, and depressed worldwide demand for products will continue in 2010 with some slight improvement. The political crisis seems to be getting worse, and will be with us for at least three more years in the US. Democrats are forecast to lose their control of Congress in the November 2010 elections, and that will certainly bring change to the present economic policies in the US.

The appearance of the two new wiring harness standardization activities in 2009 (the satellite plug-and-play bus and the new avionics bus) may presage a trend toward LRUs and optical interconnects in critical embedded systems of the future. That same trend has been underway in the data centers where 1U motherboard boxes stacked in a 19-inch cabinet, connected with 10G/40G optical connections, are becoming the primary architecture. While I do see continuing demand in MIL/COTS for copper-based backplanes (especially in ATR boxes), I also see significant opportunities for optical backplanes, especially in avionics systems. These architectural trends will put continuing pressure on backplane/packaging suppliers as large market segments move away from traditional backplane technologies.

As an industry, we need to explore the present state of the art in optical connections; evaluate silicon, architectures, and optical connector offerings; and prepare to deploy both optical backplanes and optical LRU connections by 2012. VITA will be announcing such an exploration group under the VITA Standards Organization in the coming weeks.

The best strategy for 2010 will be to sell new, more-profitable products (i.e., avoiding commodity products), sell products to more financially stable customers (i.e., avoiding commodity buyers), and sell these products in more promising market segments (i.e., avoiding financially declining market segments like telecom). 2010 will be an interesting year for our industry, full of both opportunity and uncertainty.

“VITA is launching a study group to explore possible optical technologies to prepare for the transition to optical connections.”