

## **STRATEGIES FOR COMPETITIVENESS**

**J. W. Simons  
Rockwell Automation  
USA**

As technology has evolved and matured, we begin to see common practices or standard methods applied to solving problems. We can become very comfortable in the application of these methods because we know they work. There are many control system web handling techniques that are well proven. Today's advanced drive technology makes these easy to apply and adapt to changing process requirements. There is little risk in using them because they have been proven again and again over time.

Risk aversion is natural but what are the long term effects on overall competitiveness? How much risk is prudent? How do you decide to apply new technologies while also economically minimizing the risk?

Obviously, when new technologies provide significant competitive advantage, it is clear that a company should invest appropriately to minimize the risk and offer the new solution to your customers. New innovative technologies are a clear way to provide market place differentiation. One could wonder, though, how often these opportunities are being missed in today's economic environment.

These last three years have seen a very difficult economic environment. One could even argue that for manufacturing, the last five years have shown less than robust growth, especially in North America. On the surface, the US economy certainly looked quite different three years ago because of the high economic stir of the "dot coms"; however, the underlying industrial economy was weak by traditional measures.

This was further compounded by the strengthening of new Asian economies. As a result of this environment, many new techniques have gained prominence and have improved competitiveness. Many of these techniques focus on cost effectiveness and are quite innovative in themselves.

With the resulting over capacity, there has been a continued consolidation of manufacturing operations in many core industries. The consolidation process creates significant economic advantage going forward but tends to reduce near term investment. Consolidation and the drive for efficiency have led to new ways to drive dramatic improvement in many areas of the business model. Some of these new techniques include: Six Sigma, Lean Production, Build to Order, Enterprise Resource Planning, Extended supply chain JIT, Global Sourcing, McKenzie's approach to Integrated Cost Reduction, Intelligent Maintenance Systems, Advanced total asset management processes, Customer Relationship Management, and real time costing. There are undoubtedly more that can be added to this list.

These techniques are yielding significant productivity improvements across many industries and driving new dimensions of competition. They all drive waste out of the business and improve cycle time across any business process. Results are lower costs, faster response to dynamic market conditions, and greater attention to customer needs. These techniques have proven themselves with results and are becoming permanent methods that drive business improvement. At Rockwell Automation we are working hard to drive "lean principles" into new product development. All these tools provide us a vast array of techniques to improve every aspect of the business model. Careful thought has to be given to each individual business and the tools that are appropriate for your current business conditions.

An area that can still achieve significant improvement is the true tying of the production floor to business processes in a very real time fashion. As waste is driven out of our processes and time frames are compressed in the production cycle, this will become an essential facet of future effectiveness. The Internet has provided significant improvements in tying together customers and chains of suppliers in very efficient--almost real time--ways. It is now essential to understand exactly what is happening on the production floor and to communicate with all external suppliers to dynamically respond to new opportunities.

There are great examples of this, but there are many more opportunities to be explored. Information is the critical link. Obtaining knowledge from this information is the real differentiator for these systems. These systems will be significant as "webs" and alliances become a future part of global competition.

These processes will continue to be ingrained in our businesses, but let's shift thought just a bit. I want to use an analogy relevant to the business of Drives, since that is what I am most familiar with, but I think it is easily applied to other areas. A simple process that can be applied to look to the future is "What If?" It is easy to envision probable scenarios looking into the future. A lot of basic research and old fashioned brain storming is helpful to make it relevant. The nice thing about "What If?" is that not a lot of time has to be wasted in debating the scenario or it's timing.

The analogy involves hybrid vehicles. The current business is industrial adjustable speed drives for variable speed motor control. The "What If?" in this case was, "What If hybrid vehicles become 20% of automobile production by the year 2010?" What impact would this adjacent market have to the primary market of Industrial Drives? Each of these vehicles will have an AC Drive in them. The result in carrying this premise forward is that the volume of AC drives in this adjacent market will far exceed the

volume in the industrial market. It is not even relevant if the decision is made to enter the new market, it is only relevant to look at the huge implications that the technology drivers and investment levels in the new market will have for the current market. This was actually a premise that was made five years ago. The validity is still to be tested, but the conversion process is already under way with gasoline/battery hybrid vehicles in the market and many more planned.

There is considerable talk and investment going into fuel cell hybrids for the future. There is even talk of the emerging hydrogen economy replacing the oil-dependent economy. Some would even say that the last major oil refinery has already been constructed. This may be stretching it a bit, but just think of all the other implications and other “What Ifs?” that can come from thinking about this future potential change in our basic energy source.

What is the relevance of all this? All the tools and techniques talked about earlier, which focus on the cost side of the business equation, are kind of like getting more miles per gallon out of the gasoline engine. And guess what, it is really important to do this to remain competitive in the automobile business or in any business and will remain so for many years to come. Fuel Cell hybrid vehicles may represent the future. *The future is represented by real technology breakthroughs.* The future of competition is driven by innovation. Cost side focus is the real time differentiator, while innovation is the long-term differentiator.

With the economic slowdown, it was natural and critical to focus on improving business efficiency. The question is, has this caused a reduced focus on true innovation? The good news is that innovation is alive and well. The papers presented at this conference are great evidence of that fact. The work of the researchers in industry and in the universities is critical to long-term competitiveness. The challenge is to bring balance and focus back into the business model by recognizing that economic conditions are changing again, this time for the positive.

If you do not agree with this, let’s make it a “What If?” What if economic conditions improve substantially in the next two years and all the competitors in your business have driven efficiency to a relatively equal degree, how are you going to establish leadership in the market?

Jeffery Immelt, CEO of General Electric, in an interview with the New York Times stated: “Superior (product) technology is the only route to consistent growth without declining margins.” AMR recently stated “Economic cycles are always tough on companies, but they do help industries and technology mature into a healthier ecosystem.” In his book, *Future Edge*, Joel Barker stated the three keys to the future of any organization are: *Excellence, Anticipation and Innovation.*

To keep us thinking, what are some of the new technologies that will have an impact in the 21<sup>st</sup> Century? How about nanotechnology, biotechnology, mechatronics, flexible electronics and grid computing for starters? What will the impact of IBM’s Millipede project be on data storage? This could substantially again change the cost of data storage and retrieval. Sujeet Chand, CTO and vice president of advanced technology at Rockwell Automation, indicates a renewed interest in nanotechnology. “It’s routine today to see smart devices that are connected to a network and for control to happen at a

very granular level on the factory floor. Presume the challenge is to measure the quality of paint applied in a robotic cell... Nanoscience solutions might combine nanoelectronic sensors capable of determining quality levels by interacting with nanoparticles that are incorporated in the paint film.” Rockwell Scientific is working on smart fibers that contain data and might be embedded in many types of fabrics or papers. “What IF?”

Our world today is a very global economy. Research or good ideas can come from anywhere. It is important to keep a global view of developing technologies. Collaborative research around the world is important for many reasons. As Kenneth Cooper stated in his book, The Relational Enterprise, “The organization is no longer defined as what’s within the bounds of its offices and factories. An organization is now defined by the breadth and depth of its relationships-a network that can go deeper into customer, vendor, and partner supply chains.” This also applies equally well to research relationships. Only with the proper research and the proper vision can innovation have the impact on business performance that’s required.

One word of caution. With the globalization of research and development, be careful to define *core technology* for your business. Choose your partners wisely but protect your core technology. The power is in innovation. The economic value is in the Intellectual Property rights of that innovation. The world is not uniform in the protection of those rights.

Now back to the start. What if web handling machines were fully identified in a simulation environment that allowed simulation experiments to be made that fully incorporated all the elements and properties of the materials, the machinery and the control systems? Imagine that this could be done by design engineers on a very fast basis, and that the results would actually be reflected in the machinery, controls and products with a high degree of correlation. How would this reduce the risk? How would this allow innovation to make progress?

As John McDermott, Senior Vice President, Rockwell Automation, Global Manufacturing Solutions recently stated, “Only the intelligent application of manufacturing expertise and proven solutions can enable you to reach that goal” of economic prosperity. Let’s not lose sight of all the business tools that have been developed during these difficult economic times, but let us also recognize the power of innovation.

Let’s move that needle, take some risk and let innovation take the field and lead us into the 21<sup>st</sup> century!