

Knowledge Based Business: Making the Case for the Master System Integrator (Part Two)

In the last issue we discussed changes at work in the way that control systems are delivered in New Construction and Existing Building Markets. This issue will continue the discussion and describe the evolution of a new “entity” – The Master Systems Integrator.

If the market trends expressed above are accurate, certain skills are essential if an entity is going to successfully respond to them now, and in the future. While it is natural and correct to assume that this entity will evolve (and is evolving) as the “Next Generation” control contractor, significant changes will occur in the “prototypical” skill set that this entity possesses, and the way this entity conducts business. Many control contractors already possess at least some of these skills, as this evolution is already underway. Assuming the current market trends described continue, and for the purposes of discussion, let’s try to describe the Master Systems Integrator as he will exist and operate, and the marketplace that will exist in the (not too distant) future.

First and most importantly, his/her business will be “knowledge-based” rather than “product-based”. Technically, this translates into understanding the underlying mechanical and electrical engineering and computer science that is applied to the devices and tools that we use, at a level deeper than is required today. Understanding macroscopically and microscopically how microprocessors are applied in real-time, and intimate knowledge of communications standards will become paramount in the MSI’s ability to do his/her job.

Systems are integrated because there is productivity to be gained, energy to be saved, security to be enhanced. In order to proactively look for and implement these benefits, the MSI will possess an engineering-level understanding of all building processes and systems, including their operation and energy utilization. If the systems in a facility include an industrial or manufacturing process, the salient characteristics of this process will also need to be understood.

The MSI will understand the perspective of the IT professional, and how to peacefully share a facility’s informa-

tion backbone while maintaining security and stability of the pipeline. His/her network knowledge will extend from wireless PANs and non-deterministic battery-powered mesh arrays through giga-bit fiber Ethernet, cell phones channels and satellite. He/she will understand the functionality and interface with non-realtime software systems including databases, business systems, MRP/ERP systems and ASP services provided over the Web. His/her knowledge of developer level software, the ability to apply developer tool kits for custom driver development and his ability to use Web M2M tools like Microsoft Visual Studio, will all enhance his/her ability to resolve the more obscure integration problems.

His/her ability to provide services will not be impeded by either lack of proprietary product knowledge, or access to tools and licenses necessary to self-execute the work, regardless of genre, age or rev. level. His/her staff will consist of individuals who specialize in maintaining knowledge of selected legacy system product lines that he/she commonly sees in his/her areas of business interest. He/she will do this by maintaining non-exclusive supply and support agreements with a wide array of product suppliers.

Further, he/she will actively participate in professional organizations where the pooling of legacy system information via “Web boards” and electronic archiving will facilitate technical solutions for less common and older products.

As a businessperson, the MSI will understand the performance and price differences between an array of comparable digital devices, and will have expanded his/her ability to purchase from a wide variety of sources. As products continue to converge into commodities, competitive pressure will make “shopping” much more of a discipline. Matching technical requirements, products and price requires a special skill set and experience, and it is

not unreasonable to see this as a full time position in larger organizations.

The MSI's business will include consultative services. He/she will understand how to operate as a company that sells intellectual property as a product. New skills will include how to develop functional specifications based on the results of an extensive client needs analyses, and site surveys. Marketing these new skills will include a focus on harvesting and maintaining "certifications" – proof sources of competence – plaques, diplomas, references from clients, case studies of successful design projects, etc. He/she will sell these services both to consulting engineers, and clients with systems. The "free" engineering services that control contractors traditionally supplied to the consulting MEP engineers in hopes of gaining a captive client base will be a thing of the past – once standards-based systems have been designed, installed, commissioned and documented correctly, a durable competitive environment exists for that system, and system additions and service can be competitively bid.

The MSI will carry engineers liability (errors and omissions) insurance to protect him/her from law suits that might result from mistakes made in design/build projects and also in intellectual property (designs, professional opinions, and recommendations) that results from "pure" consultative projects.

Finally, the MSI will "self-brand". He/she will no longer be "the (Brand Name) rep". He/she will add status to the products that he represents, and not the other way around. His/her ability to be perceived as "objective" to his client base will be critical to his success in his/her role as consultant. Representing as many DCS product lines as can be supported will assist in this objectivity.

The Marketplace and Opportunities in the (not to distant) Future

In the new building construction market of a few years from now, our MSI will draw a significant portion of his business revenue from the engineering services he provides as a sub-consultant to the "prime" MEP engineering firm on the project. Various building process control system sequences of operation and control configurations, and an overall network connection scheme will be designed as part of the mechanical and electrical system sizing and selection process at the design phase of the project so that these sub-systems can be correctly fabricated and programmed by the manufacturers prior to jobsite delivery. In addition, specifications for sub-system integration sequences, overall building system energy, productivity, and security optimization, user interface and any non-packaged control devices required for the project will be written in sufficient detail to specify intent and identify coordination-sensitive issues. All integration-related field labor will be accomplished by the site IT contractor, who will also provide the specified

loose hardware, client and server PC's and user interface devices.

Once the project has proceeded through the bid phase, submittals for the various subsystem controls and the systems integration work will be reviewed and approved by the MSI. The MSI's contribution to the building construction process will be to oversee the installation and wiring of the few remaining wired and field-installed devices which cannot be economically packaged. He will verify that the network requirements and sub-system connections are installed as he has specified.

He will field-verify that the specified HVAC control, access control, lighting control, electrical power monitoring, fire and security subsystem components and configurations – both wired and wireless – have been delivered and factory-installed as specified in the project plans and specifications. His field reports and oversight will become the punch list that the installation contractors use to begin their warranty. He will oversee the commissioning of each packaged control subsystem and verify compliance with his sequences of operation with each responsible site contractor, and will be part of the acceptance signature chain that will start warranty on these subsystems.

Finally, when subsystems are commissioned and accepted, he will "bind" data between sub-systems, provide overall system energy and productivity optimization and SCADA strategy that is specified in the project documents, then develop the user interface software and finally demonstrate same to owner and "prime" engineer.

From the above, it should be clear that our MSI has become more engineer than contractor, with different responsibilities and potential liabilities. It should also be clear that his manpower requirements and skill set is markedly different from the "prototypical" control contractor of today. As a control contractor, he was a minimalist. He was driven by competitive pressure to provide systems that meet "the intent" of a set of directions written by others. To some extent he was expected to fill in the important details of a performance-based specification, but was not responsible for the overall design of the system. He followed directions and, if so motivated, could capitalize on the mistakes of those who incompletely understand what he did. He was a master of production – he survived and flourished by successful replication, and efficient use of trade labor.

In his new role certainly some of his replication discipline will remain. Certainly all the control application and systems knowledge will be more important than ever. Significantly more important will be the ability to convey ideas to others verbally and in written form and to document activities and events that may or may not become important. He will have learned to operate effectively on the "intellectual" side of the construction process, with all of its own special politics, chain of command, egos, and personalities.

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In the performance of “direct-to-owner” proposals in the existing building market of the (not too distant) future, our MSI will be able to maintain more of his traditional role as turn-key systems provider. Since he will control the scope of work for projects as a “prime” contractor, he will provide both the design and build phases of the work. While some of the work will entail additions and service for existing legacy systems, additional opportunities will include “transition plans” for larger systems, with the objective of pulling them forward into standards-based technology. A transition plan for a client with a campus or large building will begin with a detailed “needs analysis” to determine client expectations for the new system, along with training the client on the current state of the art. Following this will be a detailed site survey to determine system inventory and dynamic testing of components and signal and network wiring to assess what can be reused in the system upgrade. A new system architecture will then be designed to accommodate the existing geography and any changes desired by the client. The transition plan will conclude with suggested phasing for the retrofit along with budgets for each phase of the work.

Since one of the most salient benefits of standards-based systems is the capability of creating and maintaining a “durable competitive environment”, budgets will also be submitted for the creation of facilities standards which will document the necessary logistics and software discipline required to create a level playing field so that no economic or knowledge barriers exist to competition for system adds, alts or service. If such documentation is created correctly there is no reason why the MSI cannot be included in a pre-approved short list of potential bidders for the work at the site included in the transition plan. For those clients who do not possess the ability or desire to manage their “durable competitive environment”, maintaining current documentation, maintaining the user interface changes and acting as owner’s liaison for control system additions and alterations in a larger campus or complex is a viable business opportunity for the MSI.

Additional opportunities will exist for the MSI in selling his turnkey services to clients desiring aggregation of diverse existing DCS systems. Such clients will include those desiring central SCADA for a group of existing buildings acquired as a result of growth or merger, as in the case of banks. In addition to the issues attendant with normalizing data from many proprietary systems, understanding the particular needs for network security uninterrupted clean power, and high availability in this industry make banks a particularly viable opportunity.

Finally, a very real opportunity is evolving for the MSI in the area of ASP integrations. Providing value to a DCS client as a service over the Web requires “connecting” that DCS to the service provider. The service provider often needs and provides “normalized” data from and to each building. The MSI provides a “one-stop shop” for integration service to the ASP. Whether the service is remote mon-

itoring, continuous commissioning, energy optimization, DSM load curtailment programs, all ASPs certainly know more about their service than how to connect proprietary DCS systems. In addition, most are not contractors who understand the logistics of retrofit construction in an occupied facility.

In Conclusion...

The time line for the arrival of the “not too distant future” is hazy. Paradigm shifts have traditionally been slow in the construction industry. However, since the Web standards effort is being driven by perceived immediate returns, it is the opinion of the writer that the integration technologies like Microsoft’s “.net” movement, and the 3WC’s XML standards effort will put the “connection tools” we need in our hands at an ever increasing pace, which will tend to pull the “marketplace of the future” into the “marketplace of the foreseeable future”.

Final note to fellow contractors – it is (purely) the opinion of this writer that becoming a Master Integrator is not an option over the long term. The term “Master” and the differentiation between MSI and control contractor will disappear. Today’s control contractor will either be an employee of a subsystem manufacturer, designing and starting up unitary subsystems under the direction of an MSI, or he/she will be an MSI.

On construction projects, the mechanical and electrical equipment manufacturer will provide material sales and unitary controller programming. Wireless technology, the IT cabling contractor, the site electrician will provide installation and the MSI will provide networking and system optimization programming, user interface development, system commissioning and service.

The picture painted above is not meant to be “doom and gloom”. In many ways, we will be finally recognized for the actual value we bring to the construction process. There are many ways to fill the “voids” created by the absorption of the components of our current business through diversification, and to some extent, there is time. The message of this article is that offering “business as usual” as a second-tier, smart electrical subcontractor, selling a single line of proprietary controls to mechanical contractors is not a good idea if you are a person with 5 years or more left in your career. The good news is that you already have a lot of the tools required for continued success in the “knowledge-based business” of the “not-too-distant” future!

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