

The perfect storm

New business opportunities in services are changing the automation world

Larry O'Brien

The services market remains the fastest growing segment of the automation business today. Automation suppliers are offering an ever-increasing scope and breadth of services designed to improve the bottom line for manufacturers – spanning from the front-end engineering and design process through operations, outsourced maintenance and performance improvement. This leaves end users with a wide range of service choices from automation suppliers, many of which can provide real cost benefits and fill an increasing skills gap.

Industry insight

The growth in automation services is a relatively new phenomenon. Going back 10 years, most of the growth in the automation business was centered on hardware, which in most cases was highly proprietary and therefore highly profitable for automation suppliers. The influx of commercial off-the-shelf components and technologies, from microprocessors to operating systems, eroded the price of hardware and even software. Naturally, the automation suppliers increasingly turned to their service offerings as a way to drive growth and profitability.

The services market did grow for several years, and automation suppliers did a good job building their vertical industry, applications, project execution and outsourced maintenance capabilities. In the past three or four years, however, a perfect storm has formed that has driven growth in the services business to unprecedented levels that show no sign of stopping any time soon. According to a recent ARC study on services provided by automation suppliers, the market reached \$14 billion in 2006 and will grow at an average annual rate of more than 12 percent through 2011. This is almost as big as the market served by third-party systems integrators and engineering and construction firms, with one exception – the suppliers and automation vendors are experiencing a lot more growth.

So what is this perfect storm and why is it resulting in such a big opportunity for both suppliers and end users? It really comes down to the convergence of three things – the shrinking pool of

highly qualified labor worldwide, the booming market for new plant construction in Asia and other parts of the world, and the need for manufacturers to drive ever-increasing levels of performance from their plants and factories to remain competitive.

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Labor – a global issue

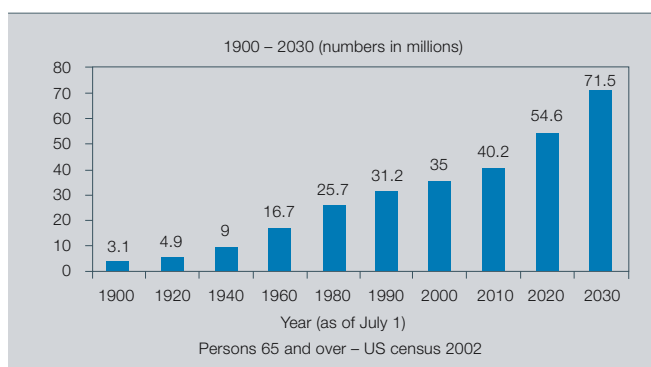
The primary contributor to growth in services over the next few years is the continuing shortfall of skilled labor among end users. “Baby boomers” – children born after the Second World War and into the boom years of the 1960s – are starting to reach retirement. Many of them are now, or soon will be 60. This is starting a wave of retirement that will see the number of people aged 65 and over in the United States alone exceed 70 million by the time the last boomer retires in 2030 ¹. The average age of workers in the manufacturing industries of developed countries is already over 50. Companies have downsized, right-sized and re-engineered their workforces without apparent thought for the consequences of this upcoming retirement tidal wave. The paradox is that although workers are getting

older on average, the average retirement age has dropped to 58 years, in many cases due to the re-engineering process of the past couple of decades.

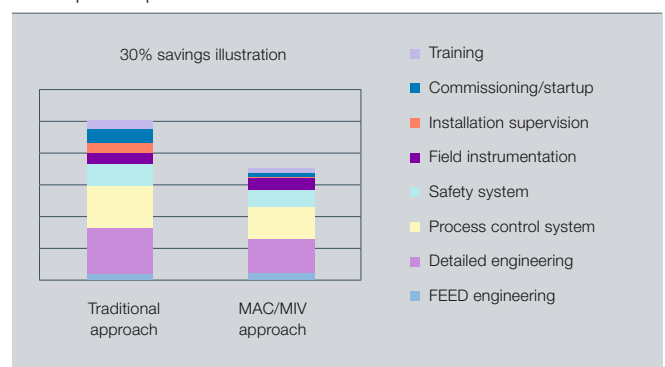
Data from the U.S. Census Bureau shows that, as a percentage of the world population, the largest growth area in the next 50 years will be in the ranks of the elderly. Several governments have responded by increasing the statutory age of retirement, in the case of Germany, for instance, to 67 years. In a recent interview, a major refining company stated that they lost 2,500 years of experience in 2006 when 100 operators retired at one site, each with an average of 25 years’ experience. As further evidence, a major chemical company said they analyzed their plant demographics and found one of their largest plants would lose 75 percent of its operating staff to retirement by the end of this decade. The same is also true of many discrete manufacturers.

The potential resource pool is diminishing too, as today’s youth has little or no interest in studying traditional engineering subjects and following a manufacturing career. Currently, no universities in the United States offer process automation as a major. Younger people are interested in computers, but want careers in Internet and computer gaming related areas. The manufacturing industry has failed to show young people that most plants are computer controlled today, and computer skills are as necessary in a modern manufacturing facility as any other skill.

¹ US population forecast for persons 65 and over



² The MAC/MIV approach can result in project cost savings of up to 30 percent.





Younger workers no longer feel loyalty to a company, as many companies have not returned that loyalty in recent times. These younger workers will gain the needed experience and then start looking for a better opportunity in a five-year timeframe. The onus will therefore be on manufacturers to return to older traditions of treating employees with fairness and respect, giving them good and adequate training and a challenging working environment. In recent research by ARC Advisory Group, several manufacturers told us that tomorrow's operators will be much more than "valve turners", they will be challenged with continuously improving the plants they operate and provided with the skills and training they require.

MAC/MIV/MICC cost benefits

Large grassroots projects are ubiquitous in the developing economies of the world, and there is an unprecedented demand for system integration and project management services. End users are increasingly constrained by personnel issues, diminishing capital budgets and shrinking timetables. Aside from grassroots construction activity in emerging markets, end users are also faced with the task of executing multiple projects simultaneously in disparate geographic regions. With many of the world's large engineering and construction firms paring down on their automation departments,

end users are increasingly looking to suppliers to take on the role of a main automation contractor (MAC) to assume responsibility for all automation related aspects of a project.

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Many of the world's leading end users, particularly in the process industries, are applying the MAC/MIV/MICC (main automation contractor/main instrument vendor/main instrument controls contractor) concept to all of their capital projects. The benefits can be considerable. One major end user in the hydrocarbon industry, for example, has reported up to 30 percent savings on projects compared to the traditional approach. Costs are reduced in nearly all areas of the project, from training to commissioning and installation.

The 3PM boom

ARC defines 3PM (third-party maintenance) services as value-added sup-

plied services that utilize vertical domain expertise, specific asset knowledge and diagnostic technologies to provide efficient maintenance of critical automation and production assets

2. Automation assets typically include hard measurement assets such as pressure transmitters, flow meters and control valves. Production assets include all other equipment, which varies greatly and is vertical industry specific. Asset classes include vessels, pumps, heat exchangers, rotating equipment, etc. 3PM contracts vary greatly with each service supplier, with the scope dependent upon the resource knowledge of the provider. ARC research has confirmed that the fastest growing segment of 3PM services is provided by automation suppliers. These suppliers have gained the trust of many users and have won 3PM contracts for all assets, regardless of manufacturer.

Essential to improved ROA

Within the process industries there are literally millions of control loops in use that reduce energy consumption, raw material usage and work force requirements. In addition, they form the foundation for safe and reliable operations. However, in a typical plant more than half of all loops are actually increasing variability, thus negatively affecting quality, throughput and return on assets (ROA). Even if a process is running at optimal economic conditions, performance deterioration

Industry insight

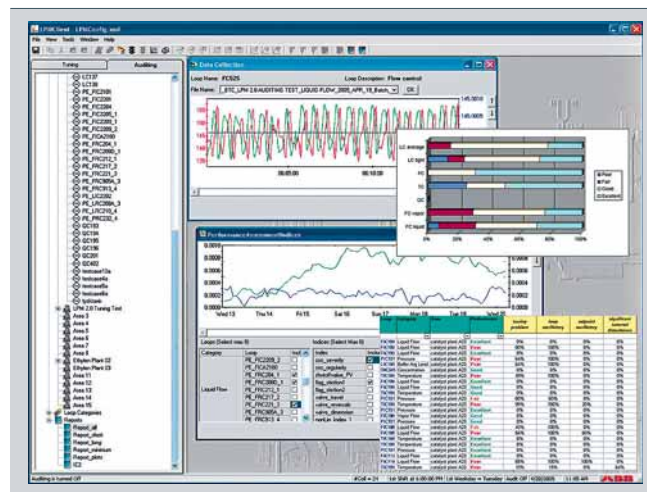
occurs from numerous sources such as changes in business strategies, modifications in operating conditions and ageing equipment.

Operations must be constantly vigilant to ensure that control loops operate at peak performance, since they are essential to operating the plant safely and efficiently. Typically, however, this is beyond the capability of most manufacturers given their resource constraints. To create a strong foundation for all operations, manufacturers must adopt a comprehensive monitoring and continuous improvement program targeted at optimizing the performance of

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control loops. Preventing deterioration of control loop performance is imperative to securing the stable and robust conditions necessary for higher-level optimization functions offered by

3 Screenshot of ABB's Loop Performance Monitor



model-based predictive multivariable control and plant optimization.

Control loop performance monitoring not only helps identify faulty control values, it also provides an indication of properly functioning valves that may have to be targeted for maintenance through a preventive maintenance program ³. The cost of not performing maintenance can be significant. Control loop performance maintenance, tuning and optimization are a balancing act: do too much and you are wasting time and money, while doing too little causes poor performance, unscheduled downtime or catastrophic failure. Since control engineers typically are responsible for

hundreds of control loops, it is not possible, or even advisable, to attempt to have all loops running optimally, since the time, effort and expense are excessive. The key is to locate the few loops that will have large paybacks. Finding these key loops is difficult without the aid of sophisticated analysis tools. Automation suppliers are finding great success in offering a suite of services around their control loop monitoring applications to help users identify underperforming loops and develop an ongoing strategy for monitoring

loop performance. Loop monitoring requires continuous monitoring and tuning to maintain control loops functioning at maximum performance because of the degradation and operational changes that occur over time.

The way ahead

End users should consider automation suppliers to fill their increasing list of skills gaps and as training and education providers. Many end users are outsourcing more and more of the functions they previously performed in-house to automation suppliers and have reaped considerable benefits. Outsourcing these functions to automation suppliers, however, requires a substantive selection process that should take into account elements such as the supplier's vertical industry knowledge and other factors.

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Footnote

¹⁾ Founded in 1986, ARC Advisory Group is a research and advisory firm in the manufacturing and supply chain sector. See www.arcweb.com

