What constitutes an open architecture and can it be defined for ATE? For a system architecture to be accepted as standard and open in any industry, it must be documented in such a way that anyone can follow and implement it. It must also accommodate all the interface standards that have been previously established and are in place in the industry. It must fulfill the technical and economic requirements of the industry using the standard and the customers buying it, and above all it must be accepted and implemented by most of the major players within the industry.

The ATE industry is not new to standards; it has supported a number in the past, mostly based on the necessity to integrate third party products, such as handlers, provers, MIS systems and instrumentation (RS232, IEEE488, VME, VXI, PXI, STDF and STIL). These standards which were developed predominantly by the instrumentation industry have allowed ATE vendors to take advantage of a wider availability of instrumentation, provide a faster and lower cost integration time, reduce R&D expenses and provided a faster time to customer solution.

However, even with these advantages the integration process has been complex and in many cases cumbersome, with the biggest issues being associated with speed of operation, or throughput (based on bench-top instrumentation designs), and software driver integration.

Can the ATE industry be compared to the PC model? Unlike the PC industry, the ATE industry is a custom solutions provider whose customer base is very small and very demanding, and where the economies of scale within the consumer PC market do not apply.

Many semiconductor customers want turnkey solutions, where a large part of the cost is in custom applications development, targeted at high performance measurements and very high-speed multi-site operation; and where equipment utilization is the primary concern.

ATE systems have been tailored to do this job as efficiently as current technology would allow, and in doing so, ATE manufacturers created custom, highly integrated architectures.

Recently we have seen a number of new ATE companies adopt current open standards in order to leap-frog into the market-place faster, and be more agile than their competitive incumbents. However, even these companies have had to customize standard instrumentation for the high-speed high accuracy requirements of semiconductor test.

Software has always been a major stumbling block in ATE development; to make the system run at acceptable speeds and deal with all the data and information required, real-time tailored tools have been essential.

So, is “open” possible and what is the objective? Customer’s say they would like to reconfigure ATE based on their changing test requirements and extend the life of their capital. They would like this to be plug and play and have the options of going to multiple vendors for choice and competitive pricing.

During the past decade the ATE industry like many others have adopted an outsourcing culture, where core competencies of third parties have been integrated into current systems and solutions.

But before an open architecture could be practical for the end user, it has to be practical for the ATE supplier. To this point there have only been interface standards and instrument standards designed by bench-top instrumentation vendors. The VXI and PXI standards have made some progress in addressing ATE system needs, but fall short of speeds needed for digital instrumentation and high speed coherent mixed signal DSP requirements.

ATE suppliers will also have to revisit their value-added propositions, focusing more as system integrators and solutions providers, with less emphasis on proprietary instrumentation. This is going to be a tough nut to crack as much of the support costs associated with being a solutions provider is covered by the system margins attained through proprietary technological benefits.

Is a global open architecture possible? Of course it is, however, any open-architecture initiative is going too have to deal with eating this elephant one bite at a