A New Equilibrium

OEMs are no longer leaving test strategies in their supply-chains' hands.

IN MY ROLE as a technical marketing engineer, I work with test engineers from OEMs, EMS companies and ODMs, learning about their test needs and challenges, which range from common threads to unique needs. One industry commonality is the continuous need to drive down the cost of test. This may be obvious, especially during the recent economic downturn, but even when the market is buoyant, manufacturers continue to expect us to lower test costs, while expecting far greater coverage and test capabilities. When you drill down a little further though, the differences in expectations start to emerge.

While OEMs have traditionally been pioneers when it comes to technology adoption, I have observed that for EMS firms and ODMs, new test technology is a need rather than a choice. While EMS companies do play in the consumer electronics market, many of the bigger players also manufacture more sophisticated products like high-end server, datacom and telecom boards – products that do not face the harsh cost pressure of consumer electronics. There are still cost-down expectations for these products, of course, but EMS firms traditionally have been more willing to invest in newer test technology to overcome the challenge in testing assemblies with technologies such as high-speed differential signals.

That's not to suggest ODMs are not investing. OEMs are driving their ODM supply chains to adopt new technology to keep up with product requirements such as notebook motherboards with high-speed differential signals, and to cope with PCB real estate demands as the number of nodes increase while the PCB size decreases, making it harder to put testpoints on the board.

We see our key EMS customers involved with manufacturing high-end boards ranging from 7,000 to 10,000 nodes for, say, high-end servers; these are very expensive products, and manufacturers will do everything to achieve maximum test coverage, employing a blend of x-ray to in-circuit and sophisticated functional tests. For ODMs, cost and time-to-market are more pressing issues. While maintaining higher test coverage requirements, ODMs also demand faster test methodologies at even lower costs, with their investments typically centered on a combination of manufacturing defect analyzers, in-circuit tests and functional tests at the board level.

It was observed some years back that OEMs were leaving test strategies more in the hands of their outsource partners. However, I think that trend has petered out, as the pace of technology development puts pressure back on OEMs to drive contractors toward higher standards of tests, to cater for wider and more in-depth test coverage for the onslaught of sophisticated components.

Concurrently, the proactive role played by many OEMs within industry bodies such as IEEE, iNEMI and other initiatives to drive new standards on boundary scan and BIST tests, just to name a couple, will help speed technology adoption.

Within the industry, the role of the outsourced service providers or vendors will grow in depth compared with a few years back. The reason for this is the level of engineering responsibility within the larger manufacturing organizations is rapidly evolving. Many of my production engineer contacts are no longer just engaged in test engineering roles: They wear multiple hats, which include coordinating requirements with customers, managing yield, managing system maintenance, and working with test system application engineers, as well as test program and fixture vendors.

Production engineers no longer have the luxury of time to work on deeper-level debugging and test development. However, another new equilibrium is taking shape, with the workload flowing to more test solution providers and fixture vendors – themselves a growing new breed of technopreneurs, if I may leverage this term to describe engineers-turned-small business owners who still operate within their domain knowledge.

The fallout from the recent economic downturn created new opportunities. In China, there is a well-known term for this called *wei ji*. The phrase means "crisis," but the individual characters stand for "danger" and "opportunity." Many of the technopreneurs who lost jobs during the downturn now find themselves fitting a timely and niche market to provide services back into the supply chain from which they came, albeit now with more flexibility and scalability.

For test equipment vendors to be successful, they need a solid network of partners, and technopreneurs help expand and strengthen that network by providing the needed technical knowledge in test development and debugging, as well as cost-effective local responsiveness required in the 24/7 manufacturing environment.

Test equipment vendors also have a growing responsibility – as technology coach and innovator. Not only must vendors continue to innovate in test, but we also must train our internal team well, which consists of the entire network of expert application engineers, field sales engineers and support partners – from fixture vendors to application solutions providers, certainly not forgetting the end-customers, to ensure they are technology-ready. In this respect, one common challenge across the industry is resistance to change whenever a technology is introduced. The groans of many production engineers are almost audible when we try to introduce a technology on top of already numerous responsibilities. Moving forward, training will grow in importance to ensure each area of this EMS-ODM-CEM equilibrium can evolve rapidly to adapt not just to new technology, but to the shorter, sharper economic cycles we have come to expect. CA

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