

*Editor's Note: I love seeing test leaders and organizations turn their "necessary cost centers" into strategic assets to improve profitability, time to market, and product quality. Having led, and lived through, multiple organizational inflection points, I can attest that it's both hard work and worth it, personally and professionally. Take advantage of others' insights and experiences via the global communities of test engineering leaders we host throughout the year: the Test Leadership Forum, regional advisory councils, and online LinkedIn group. You'll be amazed at what you can learn from your colleagues, both inside and outside your industry.*

—Dr. James Truchard

## Optimizing Test Organizations

In tough economic conditions, companies are more diligently looking for opportunities to gain a competitive advantage while growing revenue, profits, and customer loyalty. This has led to a strong adoption of business improvement strategies such as Six Sigma, Lean Manufacturing, Capability Maturity Model Integration (CMMI), and Agile Product Development. Additionally, companies will elevate and strategically take advantage of a support function within an organization as a marketplace differentiator.

For example, the role of information technology (IT) has changed dramatically over the last two decades. IT was originally a support function that provided standard computing applications, data storage, and routine task automation. In leading organizations, IT can now streamline critical line-of-business processes and help executives make real-time decisions at the core of a company's business. The strategic importance of IT was confirmed by the *Chief Information Officer (CIO)* magazine 2010 State of the CIO Survey, which revealed that 70 percent of CIOs are now members of their companies' executive committees.

Similar to IT, product testing has been historically viewed as a support function during the product development and manufacturing process—just a necessary cost center. Hence, many companies invest at much higher rates in other areas of "strategic" value such as product development and sales enablement. This leaves the test organization fragmented, outmatched to meet business

requirements, and outdated with old technologies and test methodologies that often create bottlenecks for their organizations. However, as research has shown, test is critical because it validates a product's performance, reduces development time, increases quality and reliability, and lowers return rates. By catching defects earlier in product development and collecting the data to improve a design or process, test delivers tremendous value to the organization.

An emerging trend for electronics manufacturing companies is using product test for competitive differentiation. This has resulted in elevating the test engineering function from a cost center to a strategic asset. This shift was confirmed by a recent global NI survey of test engineering leaders who said their top goal over the next one to two years is to reorganize their test organization structures for increased efficiency. This strategic realignment reduces the cost of quality and impacts a company's financials by getting better products to market faster. Research has revealed that "optimized" is the ideal maturity level—when a test engineering organization provides a centralized test strategy that spans the product life cycle. This optimized organization develops standardized test architectures with strong reuse components, enables dynamic resource utilization, and provides systematic enterprise data management and analysis that result in company-level business impact.

Companies making this transformation must commit to a long-term strategy because, according to NI

COMMITTING TO A LONG-TERM PHASED APPROACH

AD-HOC (COST CENTER)	REACTIVE (CONTRIBUTOR)	PROACTIVE (BUSINESS ENABLER)	OPTIMIZED (STRATEGIC ASSET)
	Enterprise Alignment		Monitored Business Objectives
	Business Planning		Centralized Strategy; Standardized Architectures, Tools, and Processes
■		→	
■	Deployment Life Cycle	→	Strong Reuse From Design to Production
■		→	
	System Development		Dynamic Resource Usage
	Test Technology and Architecture		Systematic Enterprise Test Data Management

Transforming a test organization into a strategic asset requires commitment to a long-term phased approach.

research, it generally takes three to five years to realize the full benefit. A company must have a disciplined and innovative investment strategy to transform the test organization through the four maturity levels: ad-hoc, reactive, proactive, and optimized. Each level includes people, process, and technology elements. The right people are required to develop and maintain the cohesive test strategy. Process improvements are required to streamline test development and reuse throughout product development. And finally, tracking and incorporating the latest technologies are required to improve system performance while lowering cost.

When companies implement changes to process, people, or technology, they are sometimes tempted to bypass transition projects because they believe they can attain a higher level of maturity more quickly. However, before an organization can achieve an optimized level, it must first reach the proactive level in each major competency area: enterprise alignment, business planning, deployment life cycle, system development, and test technologies and architectures.

An organization steadily builds a foundation for strategic transformation by sticking to a sequential approach and identifying short-term initiatives that help the company improve its maturity level and that map to annual operating objectives. And as the foundation gets built, test productivity and asset utilization increase, paying dividends on the original investment. This phased approach enables organizations to realize benefits early on—after the completion of just one or two projects. Examples of these transition projects include the following:

- Standardized Test Architecture/Process (Ad-Hoc->Reactive)—Adopting standardized software and hardware architectures and test methodologies

improves productivity with faster test code development and increased test asset utilization.

- Test Total Cost of Ownership (TCO) Financial Model (Reactive->Proactive)—Creating a TCO financial model for test helps companies calculate business productivity metrics and financial metrics (return on investment, payback period, net present value, internal rate of return, and so on) for test improvement initiatives.
- Enterprise Test Data Management (Proactive->Optimized)—Developing a comprehensive test data infrastructure that spans across sites with universal access improves real-time decision making.

This transformation requires a shift from only supporting ongoing operations to developing innovation-based initiatives alongside ongoing operations. The test industry is still early in its transformation. Using the IT industry as an external benchmark, IBM published in its 2010 global technology outlook that highly efficient companies that strategically transformed their IT organizations spend only 60 percent of their IT budgets for ongoing operations, leaving 40 percent for new and innovative initiatives, compared to other organizations with an 85/15 split in their legacy business models. Similarly for test, leading companies gain a competitive edge by keeping their test organizations agile and matching the level of innovation leveraged in other strategic departments.

When test engineering organizations become strategic assets, they create standard test platforms, develop valuable test-based intellectual property, deliver a more productive workforce while lowering operating costs, and align with the business objectives by continually contributing to better product margins, quality, and time to market.