



Lam Research: A “Variable Virtual Company” Focuses on the Core

An On Demand Business Case Study sponsored by IBM

Becoming on demand

A leading provider of semiconductor manufacturing equipment, Lam transformed its business model by outsourcing its non-core business processes. This enabled the company to channel more of its resources to customer-facing processes like product development and customer support. By variablizing its costs and becoming more responsive to customers, Lam has thrived in an intensely competitive and volatile industry environment.

Why IBM

“Because IBM understands the issues that are specific to our industry, it can recommend solutions that work. Providing generic, non value-added advice does not fly in our industry.”

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SITUATION ANALYSIS

Background

Based in Fremont, California, Lam Research Corporation provides semiconductor manufacturers with equipment they need to fabricate chips. The company's Etch systems are used to shape the microscopic layers into circuits; Lam's chemical mechanical planarization systems ensure surface uniformity on "wafers" as they are layered with material during their manufacture. Both processes are critical in the manufacture of today's most advanced chips. Founded in 1980, Lam maintains customer support centers throughout the United States, Asia, and Europe to meet the complex and changing needs of its global customer base.

Like the semiconductor industry which it serves, the semiconductor equipment industry is marked by extreme swings in demand. As demand changes, chip manufacturers make necessary adjustments to their production schedules as well as their investments in fabrication facilities and equipment—or "fabs." These adjustments quickly percolate down the industry value chain to equipment manufacturers like Lam, who must then adjust their own production schedules to meet the rising or falling demand. For their own competitive survival, semiconductor equipment manufacturers have thus been compelled to operate in a reactive mode—with rapid adjustment a necessity.

For Lam, increasing consolidation in the semiconductor equipment industry means an increasingly unforgiving competitive environment—with success derived from agility and effective cost control.

The tight linkage between semiconductor manufacturers and equipment vendors is also seen in the increasing levels of consolidation in both industries. Among chip makers, key drivers of consolidation are the industry's natural maturation, as well as the fact that fewer companies can afford to invest in the enormously expensive fabs needed to build today's state-of-the-art semiconductors. As the number of chip vendors has fallen, equipment vendors selling into this denser market have been forced to follow suit, generally through acquisitions designed to broaden product lines and improve cost efficiencies. As a result of this consolidation, 80 percent of industry revenues are expected to be generated by just half a dozen equipment manufacturers by 2010. For Lam and its peers, this is expected to mean an increasingly unforgiving competitive environment with success derived from agility and effective cost control.

Business Drivers: Strategic Focus Amid Volatility

On the whole, Lam had been reasonably successful in managing the peaks and valleys of industry demand. However, the company—like nearly all competitors—had almost always lost money during industry downturns. In addition to the company's bottom line, industry cyclical volatility took a broad toll on Lam's operational effectiveness. One of the most adverse effects of industry demand swings was that it forced Lam's management to address cyclical operational issues—such as the need to hire or lay off large numbers of workers—at the expense of more core functions like product development and customer support. The epiphany came in 2001, when CEO and resident visionary Jim Bagley concluded that a business model that relied on reacting to the industry's "boom-and-bust" cycles was sapping the company's competitive vitality. As Steve Newberry, Lam President & COO, recalls, the management team saw

the departure from this business model as key to the company's long-term success. "We were tired of hiring thousands of employees and then, 24 months later, laying them off again," says Newberry. "We looked at the impact this had on employees, our operations and our financial results and basically said, 'this is crazy.'"

In an industry as intensely innovative and competitive as semiconductor and related equipment manufacturing, distractions from the company's mission posed a potentially lethal threat to Lam's competitive viability. One of the key competitive drivers for equipment vendors is the ability to respond to customers' requirements, which—due to shortening technology cycles—were growing more demanding by the day. This is especially true for Lam which, as an "engineer-to-order" company, must provide timely, high-quality technical support to customers. With reactions to industry cyclicalities absorbing more financial and human capital resources, fulfilling these customer support requirements had become an increasing challenge.

Cost control had also become a top-tier strategic priority. As semiconductor manufacturing became a more concentrated segment, increasing its buying clout, equipment vendors like Lam needed to improve their efficiencies to keep their margins intact. For Lam, the problem lay not only in the extra costs associated with industry cyclicalities but also in its core input costs, which were closely related to the company's scale.

Lam needed to adopt a more flexible business model which—by enabling more operational flexibility and cost variability—could be more closely aligned with fluctuating industry demand. The key was to focus on the core processes and functions that would best enable the company to thrive in this environment.

To overcome these challenges, Lam saw the need to adopt a more flexible business model which, by enabling more operational flexibility and cost variability, could be more closely aligned with fluctuating industry demand. The key, explains Newberry, was to focus on the core processes and functions that would best enable the company to thrive in this environment. "We saw a focus on customer-facing functions—namely product development, sales, marketing, service and support—as a way to be more responsive to our customers, while at the same time mitigating the effect of industry cycles," says Newberry. "Outsourcing non-core functions would enable us to ride out the industry cycles with a core group of employees and shift the burden of disruption to our outsourcing partners. Lam gets service level agreements which provide the expected performance levels, as well as reduced cost, which enables additional investment in core technology."

By working from a nucleus of customer-centric processes, Lam saw the opportunity to more efficiently allocate its management resources and its funding. This meant, among other things, the ability to shift from a reactive to a proactive posture by devoting more resources to R&D—thus keeping Lam out in front of the industry's innovation curve. Additionally, by channeling the management time and energy not spent on managing cycles to customer issues, Lam could be more responsive to customer needs as well as to emerging opportunities. Perhaps the most fundamental rationale for Lam's outsourcing strategy was that it would allow the company to remain profitable during downturns—a feat that has proven elusive to all but a few industry players. Lam saw that by "variablizing" its costs through outsourcing, it could substantially lower its breakeven point with no disruption in its core operations. A parallel rationale for outsourcing was the flexibility to secure lower costs through strategic service providers. Directionally, both attributes of outsourcing pointed to dramatic improvements in profitability.

ACTION PLAN AND DECISION PROCESS

Business Process Adaptations

Having established the need to build variability and focus into its business model, Lam embarked on a journey toward becoming a “variable virtual company” by outsourcing its non-core functions. Working with IBM Business Consulting Services, Lam refined its strategy and began issuing requests for proposals (RFPs) in September 2001. The company began implementing its strategy in 2Q-2002. Among the key processes outsourced were:

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- *Extranet* (4Q-2001), including all Web-based applications outside the firewall;
- *Facilities management* (2Q-2002), including management of plant and real estate;
- *Applications management* (2Q-2002), under which approximately 120 applications—including ERP—are managed;
- *Infrastructure management* (2Q-2002), including help desk, desk-side support, server management and network management;
- *Finance and accounting* (3Q-2002), including general accounting and management reporting, payroll, collections and accounts receivable, and accounts payable;
- *Subassembly manufacturing* (3Q-2002), under which pre-assembled units are shipped from suppliers and then integrated and tested;
- *HR services* (3Q-2002), including benefits administration;
- *Indirect procurement* (3Q-2002), including office supplies; and
- *Logistics management* (3Q-2003), including running Lam’s warehouse to managing its inventory.

To complement its outsourcing strategy, Lam also created what it calls a “shared service alliance” of peer companies known as CapOneSource. Comparable to a buying cooperative, the alliance is designed to let members procure from a group of standardized services (e.g., facilities management) at large-volume prices. The power of the model is the ability to secure low prices from designated service providers by leveraging members’ combined purchasing power. As Steve Newberry points out, the idea of leveraging shared services dovetails with Lam’s variable business model. “The goal of the alliance is to gain the aggregated buying power of the largest players in the industry,” says Newberry. “This should drive down costs, enabling us to be even more variable.”

While outsourcing its existing processes represents Lam’s most significant business process adaptation, the company also recently chose IBM to deploy a product lifecycle management (PLM) application (used to integrate the processes required to design, build, deploy, and maintain products) to support its product development efforts. The interesting twist is that Lam will have the PLM application hosted on an on demand basis—running it on third-party servers and paying based on its usage of the application. By avoiding fixed licensing and

management costs and employing a pay-as-you-go pricing model, the PLM solution will fully support Lam's shift toward a more variable business model.

Decision Process

Lam faced a number of key decisions throughout the initiative. These decision points pertain to three distinct facets of the overall initiative, defined as:

- the business and operations strategy consulting at the front end of the project;
- the selection of outsourcing partners; and
- the selection of the technology required to facilitate the business process integration between Lam and its outsourcing partners.

Bob Rudy, Lam VP/CIO, selected IBM Business Consulting Services to provide strategy consulting because of its experience in and familiarity with the semiconductor equipment market. "Because IBM understands the issues that are specific to our industry, they can recommend solutions that work," says Rudy. "Providing generic, non value-added advice does not fly in our industry." Another factor in Lam's selection of IBM Business Consulting Services (along the same lines) was its ability to deliver cross-industry perspective — applying cogent lessons from other industries to address Lam's challenges.

"Nobody understands ERP better than IBM. They understand that for a strategy to work, there has to be a tight linkage between business strategy, business process design, application development, infrastructure and organizational change management."

—Bob Rudy, CIO and VP of Business Excellence, Lam Research

Having opted to outsource its IT infrastructure and applications management, Lam was looking for a provider with the expertise, depth of resources and reliability needed to guarantee bulletproof performance. In 2Q-2002, Lam contracted with IBM Business Consulting Services for enterprise applications support and development and IBM Global Services for infrastructure management. As Rudy points out, expertise was the linchpin issue. "Nobody understands ERP better than IBM," says Rudy. "They understand that for a strategy to work, there has to be a tight linkage between business strategy, business process design, application development, infrastructure and organizational change management. A lot of companies just say 'I'll develop it for you,' but it really all starts with strategy. IBM gets that." Lam also selected IBM Business Consulting Services as an outsourcing partner for Finance and Accounting services in 3Q-2002.

While the provider selection was crucial to Lam's success, the company also needed a platform that would allow it to rapidly and cost-effectively integrate with its future strategic outsourcing partners. Most important was the need for an enterprise application integration tool that could seamlessly link its suppliers, customers, and other service providers. Lam considered six vendors, with the breadth of standards to support the key decision criteria. Recalling his selection of IBM WebSphere Business Integration software, Rudy points to the breadth of its "footprint" as a true differentiator. "We chose WebSphere Business Integration because it's simply the best one," says Rudy. "It has the best tools, utilities and the best integration scheme out there because IBM took the time to build in broad support. When we chose WebSphere Business Integration, we got all this functionality off-the-shelf—so we didn't have to go build anything."

SOLUTION PROFILE AND IMPLEMENTATION STRATEGY

Key Components

Software

- WebSphere Business Integration software

Servers

- IBM eServer pSeries

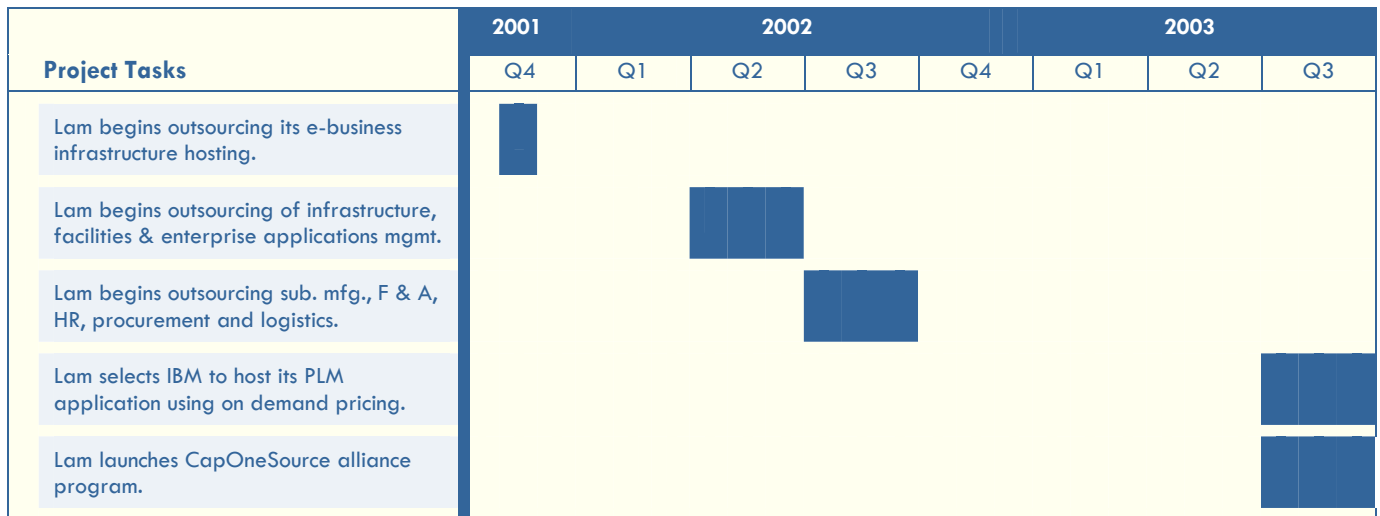
Services

- IBM Business Consulting Services
- IBM Global Services Business Transformation Outsourcing
- IBM Global Services e-business Hosting Services
- IBM Global Services Strategic Outsourcing Services

A significant part of Lam's implementation involved the deployment of infrastructure within an 8,000 square-foot IBM e-business Hosting Center in San Jose. Under this arrangement, IBM Global Services monitors and manages approximately 150 servers running Lam's enterprise applications (e.g., ERP), e-business applications and key databases behind the firewall. Specific services provided include application support, database administration, backup and recovery. Help desk services are provided from IBM staff in Raleigh, NC. Applications management services, provided by IBM Business Consulting Services, include break/fix and enhancements for over 100 applications in service. IBM Business Consulting Services also provides Finance and Accounting Outsourcing services (including all transactions and management reporting).

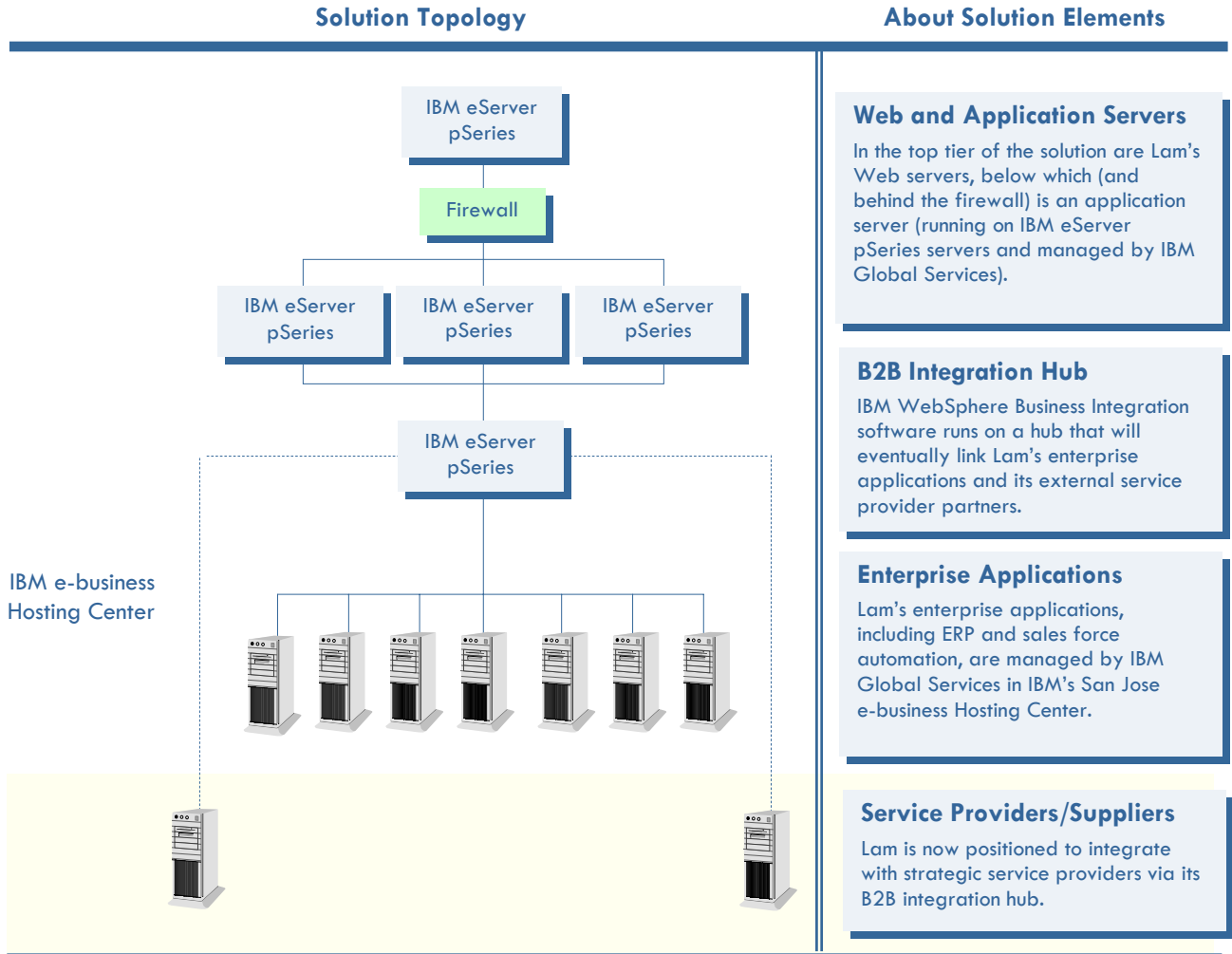
Lam's solution runs on several IBM eServer pSeries servers arrayed in a tiered architecture. In the top tier of the solution are Lam's Web servers, below which (and behind the firewall) is an application server. The bottom tier of the solution is comprised of a series of enterprise applications (see above). To establish a B2B link with outside service providers, IBM Business Consulting Services deployed IBM WebSphere Business Integration software in a hub configuration. The recent deployment of this hub is critical because it represents the primary mechanism by which Lam will integrate its enterprise applications with those of its external partners.

EXHIBIT 1: KEY MILESTONES: LAM RESEARCH'S OUTSOURCING STRATEGY



Source: Lam Research and IDC

EXHIBIT 2: BASIC ARCHITECTURE: THE LAM RESEARCH SOLUTION



Source: Lam Research and IDC

BUSINESS RESULTS

Becoming more on demand has enabled the company to fundamentally transform its business model, adding a high degree of operational flexibility and cost variability. Lam's newfound variability has enabled the company to post impressive results, with revenue and operating efficiency up and costs down. Lam's business model shift has also led to a shift in the company's competitive profile, notes Mercedes Johnson, Lam's CFO. "When you look at our operating performance, many of our metrics are better than those of the big companies in our space," says Johnson. "Until the outsourcing strategy, we were not profitable in a downturn. We have now made money in four consecutive quarters in a challenging business environment, and are literally one of only a handful of companies in the entire sector making money right now."

EXHIBIT 3: BUSINESS RESULTS: THE LAM RESEARCH SOLUTION

Business-Level Benefits	Key Metric	Enabling Process Changes
Improved Market Share	In its core Etch segment, Lam was able to increase its market share.	Lam was able to focus more energy on customer-centric issues, as well as on new product development.
Improved Operational Efficiency	Lam reduced its operations spending by 42 percent and property and equipment spending by 52 percent, making it one of the few semiconductor equipment companies to post a profit in the current industry downturn.	Lam was able to add more variability in its cost structure by outsourcing non-core business processes.
Improved Margins	In the future, Lam Research expects its new outsourcing business model to increase its cumulative net income over the course of a cycle.	As a result of its shared service alliance, Lam will be able to substantially reduce its costs.
Technology Benefits	Underlying Product or Product Attribute	Benefit in Action
IT Strategy Flexibility/Increased Ease of Integration	IBM WebSphere Business Integration/Strong support for open standards	Lam's investment in an open B2B integration hub will enable the company to reduce the cost and complexity of establishing new supplier and service provider relationships.

Source: Lam Research and IDC

Perhaps the biggest payback for Lam is the boost its “variable virtual” strategy has had on its competitive stature in the industry—a factor that is especially critical given the current trend toward consolidation. In fact, Jim Bagley points to Lam’s “variable virtual” strategy as the main driver behind its recent surge in market share, from number three to number one in the Etch equipment segment. “We’ve succeeded because we have great new products and because managers now spend less time doing operational reviews of non-core functions,” says Bagley. “They now have more time to spend on what is truly core—customer problems, customer opportunities and customer issues.”

Bagley sees Lam’s strengthened posture as the byproduct of the company’s freedom to more aggressively develop new products, as well as an emerging consensus that its new business model works. “By variablizing our non-core costs, we’ve been able to spend more on R&D [product development, customer service and support] than we have in years,” says Bagley. “Our improved performance and aggressive R&D posture has also allowed us to get the attention of some of the larger manufacturers we may not be presently serving. It makes them say ‘these guys are for real.’ “

CASE EPILOGUE

“We see the solution’s variability and responsiveness as a nearly perfect example of operational flexibility, and a testament to the value of IBM’s strategic consulting capabilities.”

—Bob Rudy

Lam plans to build on the success of its “variable virtual” business model by adding to its portfolio of on demand business processes. This is best exemplified by the company’s planned shift to usage-based pricing for the hosting services provided by IBM Global Services. Like the PLM solution to be hosted by IBM, Lam will pay only for the server resources it uses, adding even more variability and efficiency to its cost structure. The company will also continue down the path of outsourcing its non-core business processes, with manufacturing slated to be the next fully outsourced function. Having reached the watershed point of virtualized manufacturing, Steve Newberry sees the PLM system assuming an important part of Lam’s systems strategy. This reflects the emergence of PLM as a key IT platform for flexible companies that need to interact across their value chains.

Also on Lam’s radar screen is the further development of its CapOneSource alliance program, through which it hopes to lower costs on outsourced services. Bob Rudy believes that as the fledgling buying group gains more members—and more momentum—costs will fall substantially. “We expect the volume resulting from greater participation to reduce some costs by as much as 15-30 percent annually,” says Rudy. “This underscores not only the inherent variability of Lam’s business model, but also its responsiveness to the opportunity to lower our cost. We see the solution’s variability and responsiveness as a nearly perfect example of operational flexibility, and a testament to the value of IBM’s strategic consulting capabilities.”

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