

March 24, 2005

# IBM Transforms Its Supply Chain To Drive Growth

by Navi Radjou

BEST PRACTICES

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## IBM Transforms Its Supply Chain To Drive Growth

IBM Turns Supply Chain Into A Strategic Weapon, Tying People And Process To IT

by **Navi Radjou**

with Bobby Cameron and Jessica Harrington

### EXECUTIVE SUMMARY

In 2002, IBM CEO Sam Palmisano centralized all of IBM's internal supply chain functions, from engineering to customer service, under the new Integrated Supply Chain (ISC) unit. ISC's mission? To carry out four supply chain transformation imperatives that bolster Palmisano's strategy to transform IBM into an end-to-end integrated organization that can profitably meet its clients' solution requirements. After reviewing ISC's transformation efforts in the past three years, Forrester gives ISC an overall score of B in meeting the four strategic imperatives. IBM can improve since it is only midway in its journey to supply chain excellence.

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Forrester interviewed key ISC executives who were or are involved in IBM's supply chain transformation, including: Bob Moffat, SVP, Integrated Supply Chain (ISC); Gary Smith, VP, Global Logistics; Linda Cantwell, VP, Business Growth Initiatives; Lisa Koenig, Multi-Brand Enablement Program Director; Kathy Colucci, VP, Finance; Patricia Lewis-Burton, VP, Human Resources; Barbara Martin, VP, Customer Fulfillment; Tara Sexton, VP, Communications; and Vince Ostrosky, former VP, ISC Business Transformation. We also interviewed Murray Mitchell and Tig Gilliam, the former and current Global Supply Chain Leader, IBM Business Consulting Services.

#### **Related Research Documents**

"IBM Formalizes Its Software Innovation Networks"  
January 12, 2005, Quick Take

"Innovation Networks"  
June 17, 2004, Forrester Big Idea

"IBM Ramps Up Supply Chain Service Offerings"  
March 28, 2003, Brief

"Executive Overview: Adaptive Supply Networks"  
February 22, 2002, Brief

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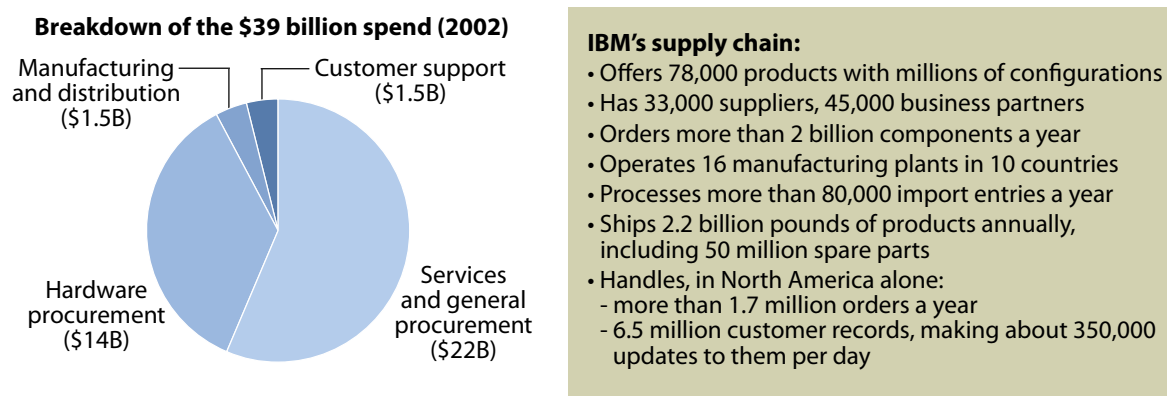
**IBM’S CEO MAKES SUPPLY CHAIN TRANSFORMATION LINCHPIN OF REINVENTION**

On October 30, 2002, Sam Palmisano, IBM’s newly appointed CEO, announced a reinvention strategy for his new firm under the moniker “on demand business.” He wanted an organization that is responsive, variable, focused, and resilient.<sup>1</sup> In 2002, IBM faced a tough economic climate as the IT sector contracted for the second year in a row. IBM’s annual revenues were down 2%, and earnings had dropped 35% to \$5.3 billion. Instead of retrenching and staying stuck in the low-growth IT product business IBM had served for 92 years, Palmisano decided to go on the offensive. He wanted to transform IBM into an adaptive organization that could profitably respond to customers’ needs for innovative solutions.<sup>2</sup>

Palmisano recognized that IBM’s success in evolving into an on demand business hinged in large part on transforming IBM’s supply chain — its \$39 billion operational backbone (see Figure 1).<sup>3</sup> What was wrong with IBM’s supply chain? By the beginning of 2002 its performance had significantly degraded due to systemic issues. In particular:

- Poor governance fattened supply chain cost structure.** IBM suffered from duplicate spending and redundant inventory that cost the company \$4 billion in 2001. Having expanded into a morass of product lines and geographies, IBM suffered from supply chain sclerosis. In 2002, there were 30 supply chains, with manufacturing and logistics inside multiple LOBs pulling levers to optimize their own businesses. And the dozens of councils created to coordinate activities among the 30 supply chains yielded little firmwide operational synergy.
- Functional silos hindered end-to-end response to market shifts.** The lack of end-to-end supply chain processes wreaked havoc as IBM’s businesses struggled to cope with demand fluctuations and supply shifts — like a 16% decline in IBM’s market cap that came in 2000, one day after the firm reported component shortages for its AS/400 systems.<sup>4</sup> The functional isolation of IBM’s supply chain operations — like supply planning done separately from demand forecasting — prevented effective matching of supply and demand.

**Figure 1** IBM Spends \$39 Billion To Manage Its Complex Supply Chain



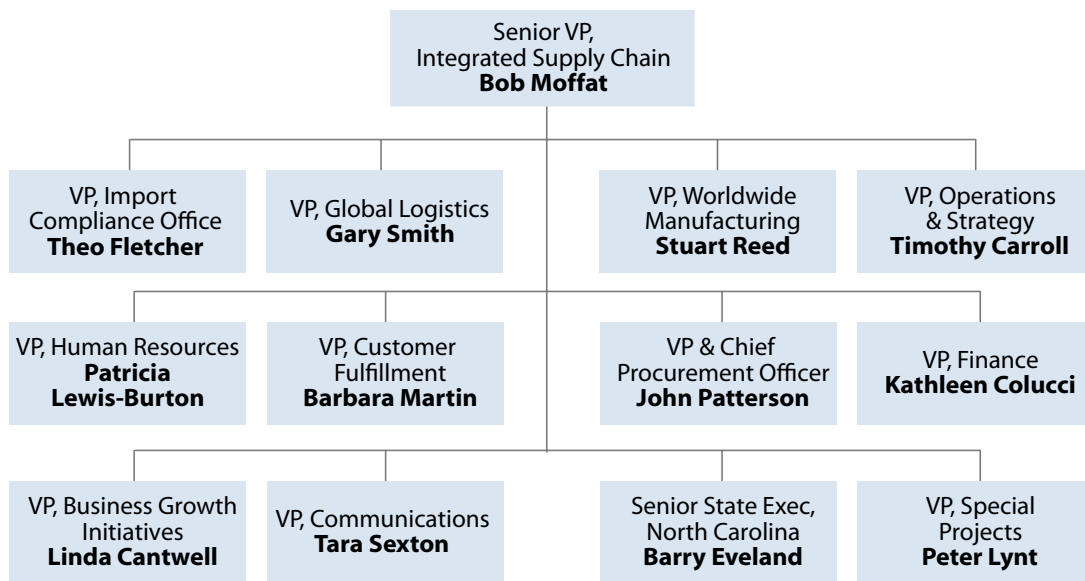
Source: Forrester Research, Inc.

3. **Ineffective workforce management hampered professional services delivery.** The process flows for managing IBM’s specialized consultants and service professionals — IBM’s profit machine — were based on phone, clipboards, and spreadsheets.<sup>5</sup> The result was a suboptimized “labor supply chain” for IBM’s labor-intensive service businesses — like IBM Global Services (IGS), which employs 180,000 professionals and brought in nearly \$40 billion of revenue in 2002.<sup>6</sup>
  
4. **Sales/ops disconnect hampered cross-brand solution integration and delivery.** The opacity and fragmentation of IBM’s physical and labor supply chains made it hard for sales to meet clients’ end-to-end solution requirements. IBM’s sales spent 20% of its time dealing with order fulfillment issues — trying to integrate products and services supply from multiple brands — instead of closing solution deals. Slower solution assembly and delivery cycles hurt IBM’s customer satisfaction ranking, making the firm only No. 3 among high-tech vendors in 2002. And IBM’s profits suffered as it lost \$250 million in cash *each* day because of sales outstanding.

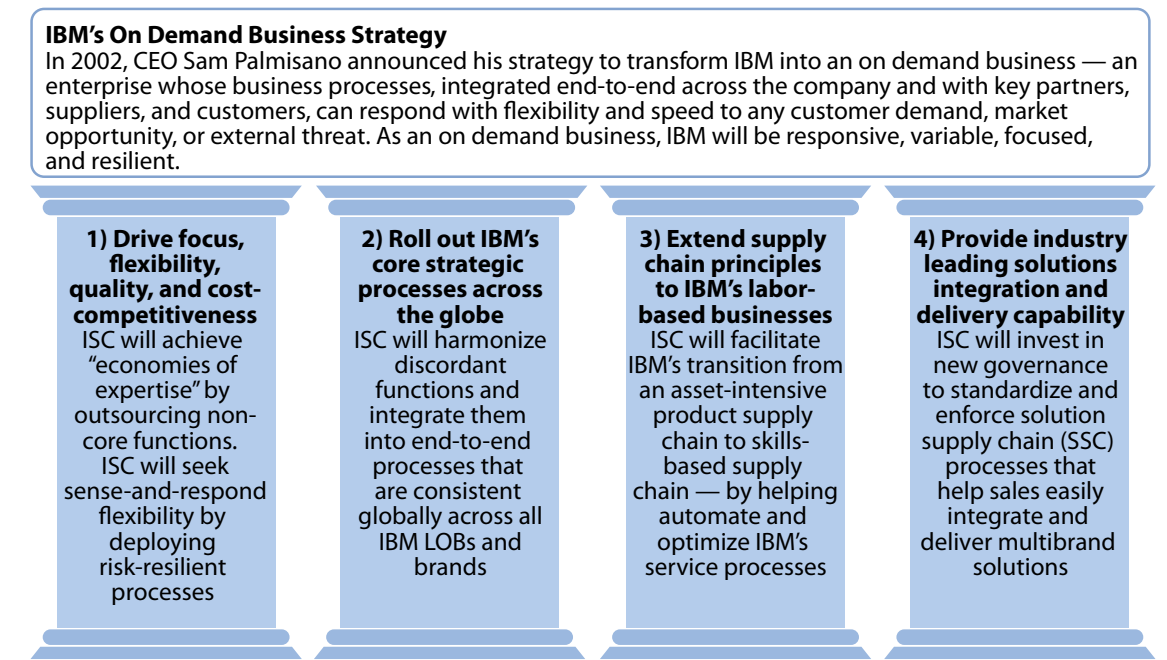
**IBM Creates New Supply Chain Group, ISC, With Four Transformation Imperatives**

In January 2003, Palmisano appointed IBM veteran Bob Moffat — who had been heading both Personal Systems Group (PSG) and the recently formed Integrated Supply Chain (ISC) group — full time to ISC. At the same time, ISC was expanded to include client-facing activities and by 2003 included 19,000 employees in 56 countries (see Figure 2).<sup>7</sup> When he took over, Moffat identified four strategic imperatives for ISC in support of Palmisano’s on demand business strategy (see Figure 3):<sup>8</sup>

**Figure 2** IBM Consolidated Its Supply Chain Functions Under ISC — Led By Bob Moffat



Source: Forrester Research, Inc.

**Figure 3** ISC's Four Imperatives Buttress CEO's On Demand Business Strategy

Source: Forrester Research, Inc.

- 1. Drive focus, flexibility, quality, and cost competitiveness.** To lean out its cost structure and deliver focus, IBM would outsource noncore functions, keeping value-added activities — to achieve what CEO Palmisano called “economies of expertise.” To adapt to market shifts and capture customer value, ISC would increase IBM’s flexibility. And to differentiate IBM from rivals, ISC would raise the bar on product and service quality.
- 2. Roll out IBM’s core strategic processes across the globe.** To achieve cross-unit synergies, drive operational adaptability, and offer a unified interface to customers, ISC would integrate functional silos into end-to-end supply chain processes that would be consistent globally across all IBM lines of business and brands.
- 3. Extend supply chain principles to IBM’s labor-based businesses.** To cost-effectively and flexibly meet growing services demand, ISC would improve IBM’s “labor-based” supply chain performance to help IBM’s service businesses better forecast, request, identify, assess, and fulfill their resource needs.
- 4. Provide industry leading solutions integration and delivery capability.** To meet clients’ need for end-to-end solutions, ISC would reorient IBM’s 92-year-old supply chain — originally designed to make and ship brand-specific products — to design, deliver, and support integrated solutions that transcend individual IBM brands.

## ISC TRANSFORMS IBM'S SUPPLY CHAIN BY ALIGNING PEOPLE, PROCESS, AND IT

Even though IBM lives and breathes IT, Moffat knew that ISC needed more than technology to carry out the four imperatives that would turn IBM's supply chain into a strategic weapon. As a result, Moffat launched a multidimensional transformation program, expanding his change management efforts to include people, process, *and* technology shaped by five insights (see Figure 4):<sup>9</sup>

- Insight No. 1: Cultural transformation succeeds when leaders walk the walk.
- Insight No. 2: CEO backing and trust are key to sustained cross-unit integration.
- Insight No. 3: Customer focus must permeate end-to-end supply chain processes.
- Insight No. 4: Employees must be measured and rewarded for end-to-end efforts.
- Insight No. 5: Technology deployment must be backed by sound IT governance.

### Insight No. 1: Cultural Transformation Succeeds When Leaders Walk The Walk

Mere centralization of supply chain operations under ISC wouldn't automatically change the mindset of its 19,000 employees — especially senior executives — who had operated in functional or regional silos for decades. Realizing that cultural transformation begins at the top, Moffat set out to form an elite cadre of leaders who would walk the walk by:

**Figure 4** Moffat Is Transforming IBM's Supply Chain Culture, Metrics, And Processes

	Before ISC	After ISC
Culture	<ul style="list-style-type: none"> <li>• Back-office mindset</li> <li>• Individual actions and decisions aimed at maximizing P&amp;L of affiliated BUs and brands</li> </ul>	<ul style="list-style-type: none"> <li>• Self-perception as corporate strategy enabler</li> <li>• Individual actions and decisions aimed at creating shareholder value for all of IBM</li> </ul>
Governance	<ul style="list-style-type: none"> <li>• Supply chain functions owned by BUs</li> <li>• Functions hard-wired into brands and measured against their individual objectives</li> </ul>	<ul style="list-style-type: none"> <li>• All supply chain functions managed end-to-end by a centralized corporate function — ISC — that serves all BUs</li> </ul>
Process focus	<ul style="list-style-type: none"> <li>• Functionally delineated</li> <li>• Efficiency-seeking</li> <li>• No focus on customers</li> <li>• Production and delivery of brand-specific products</li> </ul>	<ul style="list-style-type: none"> <li>• Cross-functional and cross-unit</li> <li>• Efficiency and flexibility-seeking</li> <li>• Customer-centric</li> <li>• Sales, design, delivery, and support of multibrand solutions</li> </ul>
Metrics	<ul style="list-style-type: none"> <li>• Operationally focused</li> <li>• Functionally aligned</li> <li>• Incentive systems of supply chain staff tied to P&amp;L of affiliated brands and BUs</li> </ul>	<ul style="list-style-type: none"> <li>• Incentives tied to end-to-end supply chain performance — measured by cost savings and customer satisfaction improvement brought to all of IBM</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• Planning, execution systems disconnected</li> <li>• Buy-side and sell-side apps not integrated</li> <li>• Supply chain-related IT initiatives lacked business insight</li> </ul>	<ul style="list-style-type: none"> <li>• Planning and execution tightly integrated and augmented with sense-and-respond tools</li> <li>• Sell-side apps (CRM) linked to buy-side (SCM)</li> <li>• ISC/IT alignment backed by solid governance</li> </ul>

Source: Forrester Research, Inc.

- **Spreading the ISC values through executive example.** In January 2003, Moffat anointed IBM's 400 top supply chain execs as ISC's "evangelists." He brought these people together at a leadership meeting in Orlando, Fla., to discuss the newly-formed unit's mission: to create the industry's most efficient and responsive supply chain. He challenged these execs to walk the walk and inspire others — by example, broadening their thinking, and identifying innovative ways to help IBM become cost-competitive, adaptive, and customer-value-focused.
- **Communicating ISC's strategy across its management.** Nine months later, in October 2003, Moffat unveiled ISC's official strategy, anchored by the four imperatives.<sup>10</sup> And Moffat identified 22 middle managers as strategy champions who would communicate ISC's four strategic imperatives across the 2,000 managers in ISC.
- **Securing bottom-up support for ISC's mission . . .** For three months beginning in November 2003, the 22 ISC strategy champions held close to 100 workshops worldwide to articulate ISC's objectives to all 2,000 ISC managers. In these workshops, ISC managers learned that their success metric had become value creation for IBM's shareholders — replacing the historical focus on individual units' P&L. In turn, these managers taught all ISC employees how to reach ISC's goals through their individual actions and decisions.<sup>11</sup>
- **. . . and sustaining it even when ISC's strategy shifts.** Moffat wanted ISC's strategy to remain stable without becoming stale — given the dynamic nature of the high-tech industry. So whenever ISC's leadership shifts operational priorities — a process Moffat calls "strategy refresh" — ISC's functional managers use the ISC intranet to immediately describe to their staff the changes this would bring to their daily lives.<sup>12</sup>

### Insight No. 2: CEO Backing And Trust Are Key To Sustained Cross-Unit Integration

Palmisano wanted ISC to optimize IBM's supply chain end-to-end to meet *both* IBM's strategic objectives *and* the LOBs' individual goals. Prior to ISC's creation in 2002, IBM's business units (BUs) "owned" the supply chain processes. Manufacturing, logistics, and customer service were hard-wired into the brands and measured against individual objectives. Even though procurement spend was centralized, each LOB optimized its own spend.<sup>13</sup> To unleash ISC's cross-unit potential, Moffat actively sought and obtained:

- **BU leaders' buy-in by delivering the goods.** ISC — and Moffat — established initial credibility among skeptical IBM brands through effective execution. LOB leaders were initially reluctant to give up control of their brand-specific supply chain functions to a centralized organization.<sup>14</sup> But ISC overcame this by managing supply chain operations *incident-free* through 2002 and exceeding cost saving targets.<sup>15</sup> In the first 12 months of its existence as a corporate function, ISC improved IBM's sales outstanding by nearly four days — freeing \$250 million in cash each day for IBM.

- **BU trust by setting an inspiring example.** During 2002, Moffat used his dual job as SVP of ISC and head of PSG to inspire other BU leaders to accept decisions that optimize activities across IBM but not necessarily within any specific brands. As a corporate function chartered with delivering value for *all* of IBM, ISC had to make decisions like supplier selection that might be at odds with individual brands' product or service strategy. For instance, Moffat asked PSG engineers to source LCD screens in support of large savings from an *enterprisewide* supplier even though it meant a higher LCD price than PSG would have paid through its traditional suppliers.
- **Sustained alignment between ISC's and LOBs' goals.** Moffat first established ISC's cross-unit credibility by seeking all BUs' participation in developing ISC's strategy during spring 2003 — when ISC's four strategic imperatives were identified. ISC has since solidified and sustained its alignment with the BUs by having BU execs participate in ISC's quarterly strategy review meetings and vice versa.
- **CEO's ongoing support of ISC's cross-unit mission.** IBM's CEO wanted all IBM BU leaders to acknowledge ISC's strategic relevance — and its mission to optimize end-to-end performance instead of individual units' P&L. To make this happen, Palmisano has kept Moffat in IBM's Operating Team — a group of BU leaders that meet weekly with the CEO to review operations of the business.<sup>16</sup>
- **Visibility for ISC's contribution to shareholder value.** Palmisano launched ISC's visibility in 2002 when he asked Moffat to report on IBM's supply chain strategy in IBM's annual financial analysts' strategy meeting. And the view into ISC has been sustained by IBM CFO Mark Loughridge who, in quarterly earnings calls, reports to Wall Street on IBM's supply chain performance — measured by ISC's six performance metrics (see Figure 5).<sup>17</sup> These metrics — which track ISC's bottom-line *and* top-line impact on IBM — reinforce ISC's strategic relevance for IBM and lay out how ISC's cross-unit performance creates shareholder value.

### Insight No. 3: Customer Focus Must Permeate End-To-End Supply Chain Processes

To better serve customers, Moffat decided to link sell-side functions to supply chain activities using what Forrester calls composite processes.<sup>18</sup> Nearly all supply chain professionals — 92% of them — consider cost-cutting their top priority, while only 54% aim at improving customer service.<sup>19</sup> But IBM found that for each point of improvement in its customers' satisfaction, IBM's annual revenue could grow by up to \$3 billion. So, Moffat deployed end-to-end composite processes — which he called “opportunity to cash” — to help IBM to:

- **Close the loop between sales and supply chain.** Working with IBM sales, ISC identified ways to increase sales force productivity by standardizing and automating customer-facing functions that require supply chain input. For example, ISC replaced six order configuration tools with one. And ISC is rolling out a hands-free composite process for managing the entire RFQ response cycle for strategic customers — from proposal to contract closeout.

**Figure 5** ISC Uses End-to-End Metrics To Track Its IBM-Wide Performance

ISC uses six broad performance metrics to track its ability to create value for all of IBM	Enterprisewide initiatives currently led by ISC to improve this end-to-end metric
1) Client satisfaction: How well ISC is performing end-to-end in meeting client expectations	<ul style="list-style-type: none"> <li>• Client self-service on delivery commitment and closed loop complaint processing</li> <li>• Streamline ordering of multibrand solutions</li> </ul>
2) Cost reduction: How well ISC has decreased cost of doing business through end-to-end operational integration, innovation, and increased efficiency	<ul style="list-style-type: none"> <li>• Deploy workforce management techniques to boost labor productivity</li> <li>• Increase flexibility of global logistics network</li> </ul>
3) Cash generation: How well ISC creates positive cash flow through end-to-end operational integration, innovation, and increased efficiency	<ul style="list-style-type: none"> <li>• Improvements in demand conditioning using dynamic pricing and revenue management tools</li> <li>• Streamlined billing and dispute resolution</li> </ul>
4) Demand/supply synchronization: How well ISC creates true visibility of supply and demand to effectively meet needs of clients and the business	<ul style="list-style-type: none"> <li>• Effective use of integrated sales/supply chain data so sales can see supply excess and shortages</li> <li>• Deploy sense-and-respond tools to rapidly detect &amp; resolve supply/demand imbalances</li> </ul>
5) Cycle time: How effective ISC is in driving competitive end-to-end process excellence and responsiveness	<ul style="list-style-type: none"> <li>• Use multitier supply visibility to give clients a more realistic commit date</li> <li>• Validate configured orders in manufacturing</li> </ul>
6) Sales force productivity: How much time ISC can give back to the sales force to spend with IBM's clients by minimizing the time they spend on ISC activity and by playing a more active/direct role in the support of IBM's clients	<ul style="list-style-type: none"> <li>• Streamline solution sales by deploying common sales processes/tools across IBM brands</li> <li>• Consolidate all sales activities (marketing, lead, proposal) under ISC's Client Fulfillment team</li> </ul>

Source: Forrester Research, Inc.

- **Deliver impeccable post-sales service and support.** ISC recognized that customer satisfaction must be sustained through the entire life cycle of an IBM offering. So, ISC extended its supply chain processes to address after-sales activities such as warranty, customer support, and returns. For example, ISC worked with IBM Research to develop logistics algorithms that allow IBM to deliver 95% of its spare parts to customer sites within a 2- to 4-hour window — not an easy feat given that IBM ships 50 million spare parts a year.
- **Integrate customer-specific solutions on the fly.** ISC's intent to deliver end-to-end solutions opened a supply chain Pandora's box — given the billions of permutations possible across the dozens of products and brands in IBM's hardware, systems, and services units. That's why ISC is deploying consistent cross-brand processes that give IBM's sales force up-to-date visibility into skills and resource availability across all IBM units — a prerequisite for matching solutions supply and demand.

Moffat obtained BU leaders' input when *redesigning* BU-specific functions in the cross-functional composite processes described above. But rather than have BUs operate these composite processes — which would have created bureaucratic inertia — Moffat assigned ownership of end-to-end process *execution* to ISC leaders. For instance, Barbara Martin, VP of Customer Fulfillment, owns the proposal-to-contract-closeout process — which cuts across both LOBs and sales, manufacturing, finance, and procurement functions LOBs.<sup>20</sup>

#### Insight No. 4: Employees Must Be Measured And Rewarded For End-To-End Efforts

ISC needed to sustain behavioral changes among its supply chain professionals — such as collaboration with sales or the delivery of end-to-end solutions — while producing the next generation of leaders. But old habits die hard. So, ISC had to revamp historically siloed performance metrics and incentive systems in order to:

- **Monitor ISC employee performance against end-to-end metrics.** ISC continually measures all its employees, rewarding them based on how they improve ISC's performance against the six end-to-end metrics discussed earlier.<sup>21</sup> This end-to-end incentive system drives ISC functions to better understand how their decisions would affect not just the next function in the value chain but also *all* other functions in IBM's value *network*. And this empathy fosters cross-functional collaboration — like ISC logistics experts working with R&D engineers to design shipment-friendly products.
- **Reward and recognize ISC employees that deliver high customer value.** ISC's top-performing employees are sometimes the ones who positively impact customer experience — not just the ones who exceed their hard goals defined by the six end-to-end metrics.<sup>22</sup> For instance, ISC hands out its Client Insight awards to ISC employees who create and sustain a better experience — not just for one unit's customers but also for all IBM customers.<sup>23</sup>
- **Develop ISC leaders with business acumen and soft skills.** ISC expects its managers, especially those eyeing senior positions, to be “T-shaped” operational experts — with cross-disciplinary experience and demonstrable business acumen and leadership. ISC even created leadership courses for training ISC managers in *soft* skills like change management and cross-cultural negotiation with overseas suppliers. ISC's Executive Resource Program reviews ISC managers' performance annually and promotes to senior exec roles those scoring high on both hard *and* soft leadership skills.<sup>24</sup>

#### Insight No. 5: Technology Deployment Must Be Backed By Sound IT Governance

ISC knows that only 41% supply chain IT projects — especially transformational ones — yield *positive* ROI.<sup>25</sup> The culprit? Ineffective IT governance. To avoid this pitfall, ISC's technology deployment seeks to leverage IBM's overall IT governance structure and integrate with IBM's broad technology investments.

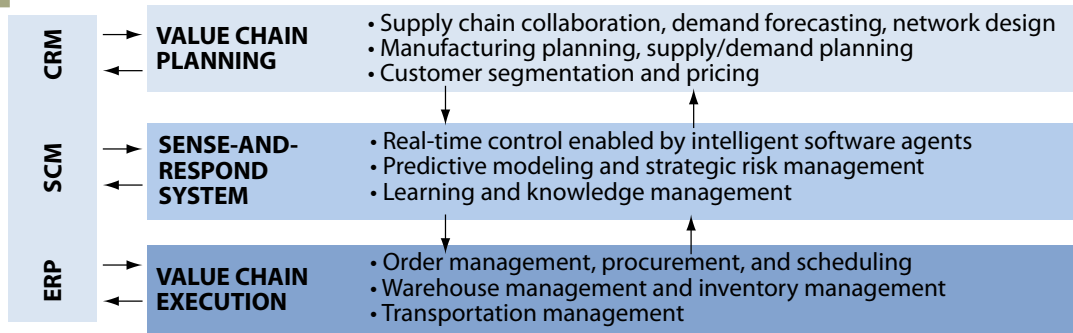
By 2002, IBM had deployed functional SCM, ERP, and CRM apps — like i2 for supply planning and Siebel for campaign management (see Figure 6-1). And in its quest to build an on demand supply chain, ISC is augmenting these planning and transactional tools with sense-and-respond technologies such as Web services, RFID, and software agents to dynamically match supply with demand (see Figure 6-2).<sup>26</sup> To facilitate the success of these technology efforts, ISC works to provide:

**Figure 6** ISC Is Adding Sense-And-Respond Capabilities To Its Core Tech Portfolio

**6-1 ISC is augmenting IBM’s core supply chain and CRM apps . . .**

Tool/vendor	Enabling role
WebSphere	<ul style="list-style-type: none"> <li>• Provide cross-brand shopping to customers using single-personalized interface</li> <li>• Telesales capability</li> </ul>
B2B Portals	<ul style="list-style-type: none"> <li>• Automate supply-side transactions</li> <li>• Automate client relationships (e.g., touchless processing of configured orders)</li> </ul>
Siebel	<ul style="list-style-type: none"> <li>• Common system to manage opportunities, leads, and client contacts</li> <li>• Targeted marketing campaigns</li> </ul>
SAP	<ul style="list-style-type: none"> <li>• Enable cross-brand, touchless orders flow</li> <li>• Receivables and payables management</li> </ul>
Selectica	<ul style="list-style-type: none"> <li>• Cross-brand configurator available on Web and mobile devices</li> </ul>
i2	<ul style="list-style-type: none"> <li>• Integrated supply/demand planning</li> <li>• Provide accurate, responsive promise date for orders</li> </ul>
DB2	<ul style="list-style-type: none"> <li>• Maintain trusted source of info for: products, prices, and customer data</li> </ul>

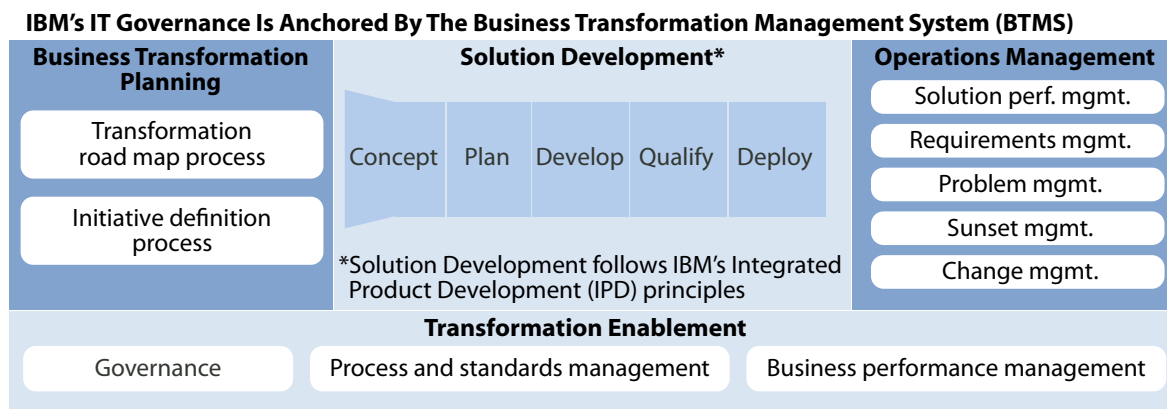
**6-2 . . . with sense-and-respond technologies developed by IBM Research**



Reference: G. Lin et. al.:The Sense-And-Respond Enterprise. ORMS Today, Vol. 29, No. 2 (April 2002)

Source: Forrester Research, Inc.

- **ISC/IT alignment.** IBM has made ISC a cornerstone of its enterprisewide initiatives focused on transforming the firm into an on demand business.<sup>27</sup> And to IT-enable all of these efforts, IBM created an On Demand CIO. A governance group oversees these IT-enablement programs, with leaders from the On Demand CIO office, the transformation initiatives, and LOBs. And this governance structure relies on IBM’s new Business Transformation Management System (BTMS) to plan, develop, and manage all IT-enabled transformation initiatives (see Figure 7).<sup>28</sup>
- **Rigorous IT project management.** Along with IBM’s other enterprisewide transformation initiatives, deployment of ISC-related IT solutions relies on IBM’s Integrated Product Development (IPD) methodology for successful management. IPD consists of six phases (concept, plan, develop, quality, launch, and life cycle), with periodic checkpoints predicated on fact-based decision-making. IPD’s cornerstone is team-based management, with cross-functional participation from IT, ISC, Finance, and Procurement.

**Figure 7** IBM Manages IT-Enablement Of Its Transformation Using BTMS Methodology

Source: Forrester Research, Inc.

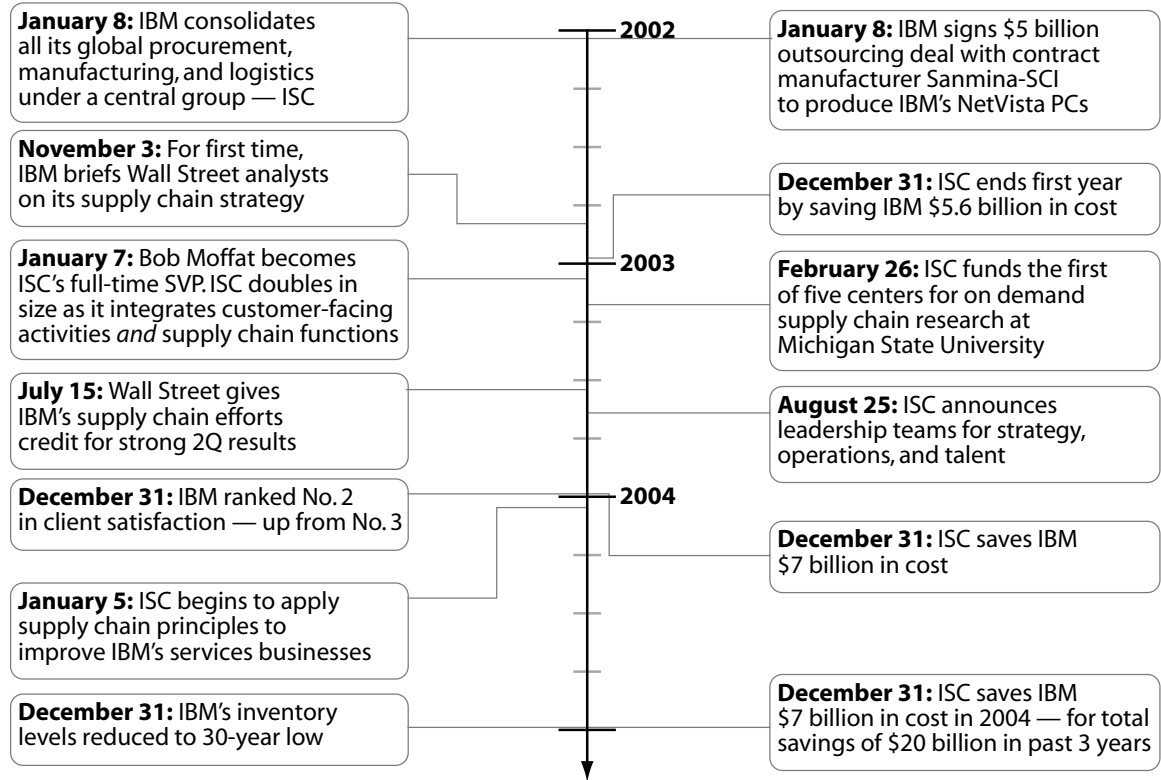
## 2002 TO 2004 PROGRESS REPORT ON IBM'S SUPPLY CHAIN TRANSFORMATION: B

Moffat calls IBM's supply chain transformation a journey — part of the ongoing effort to realize Palmisano's on demand business vision. And while ISC has reached key milestones, the journey it began in 2002 is far from over (see Figure 8-1). Forrester has reviewed ISC's transformation efforts and gives them a midterm grade of B. Broken down into ISC's four strategic imperatives, the midterm evaluation looks as follows (see Figure 8-2):

1. **Drive focus, flexibility, quality, and cost competitiveness.** Since its inception in 2002, ISC has saved IBM approximately \$20 billion — or about \$27 million per day.<sup>29</sup> And ISC increased IBM LOBs' responsiveness to supply/demand mismatches. For example, ISC helped IBM's Personal Computing Division resolve order imbalances in three weeks instead of the months it would have taken before. ISC has achieved these results through economies of expertise — outsourcing manufacturing and logistics services to partners like Sanmina-SCI and Maersk Logistics.

**Midterm grade: A-** ISC has successfully leaned out IBM's cost structure — bringing IBM's inventory levels to their lowest in 30 years. ISC has also boosted IBM's operational flexibility — increasing by 50% IBM's ability to respond to unexpected shifts in hardware demand. Ongoing savings will continue to come from procurement but also from addressing other functions, such as engineering and customer service and support.

**Work remaining:** Moffat believes that a high-tech firm like IBM can't compete solely on operational effectiveness and customer satisfaction. He knows that IBM must also crank up its innovation engine. Moffat and ISC have already delivered new products, processes, and services to help buttress IBM's ability to innovate. For example, ISC partnered with IBM Research to create the Value Chain Innovation Center, where ISC staff develop the innovation skills needed to drive more focus, flexibility, quality, and cost-competitiveness.

**Figure 8** Since 2002, ISC Has Made Progress In Transforming IBM's Supply Chain**8-1** ISC is leading IBM in its journey of supply chain transformation**8-2** KPIs show ISC has made progress since 2002 in helping IBM meet its strategic goals**1) Drive focus, flexibility, quality, and cost competitiveness: A-**

- **Client sat.:** 2% improvement in overall customer satisfaction
- **Cost reduction:** \$20 billion savings in expenses (2002-2004), logistics cost cut by 21%
- **Cash generation:** almost \$1 billion cash generated (2003-2004)
- **Demand/supply sync:** 50% increased ability to respond to shifts in hardware demand
- **Cycle time:** 16% increase in cycle time performance
- **Sales force productivity:** 25% reduction in time spent by sales on order fulfillment activities

**2) Roll out core strategic processes across the globe: B+**

- **Client sat.:** 600,000 reduction in annual customer calls thanks to self-service fulfillment apps
- **Cost reduction:** inventory levels in 2004 at lowest in 30 years
- **Cash generation:** \$180 million in cash a day freed by improving payment terms by one day
- **Demand/supply sync:** lowest number of unfilled orders in IBM history (2004)
- **Cycle time:** 93% on-time delivery
- **Sales force productivity:** 38.6% increase in time spent by sales on selling

**3) Extend supply chain principles to IBM's labor-based businesses: C+**

- **Cost reduction:** saved services business \$2.4 billion in cost (2004)
- **Demand/supply sync:** four-point improvement in BCS' resource utilization

**4) Provide industry-leading solutions integration and delivery capability: B-**

- **Client sat.:** client satisfaction with solutions delivery at 82%
- **Cash generation:** 100+ client engagements yielded \$600 million in consulting revenue

Source: Forrester Research, Inc.

**2. Roll out core strategic processes across the globe.** During the past three years, ISC tore down functional silos and standardized processes across all IBM business units for procuring, manufacturing, shipping products, and fulfilling customer orders. For instance, by consolidating customer fulfillment and support, ISC freed 38.6% more time for IBM sales to spend with clients during the past two years. And ISC is also reaping early success in integrating its core supply chain processes with R&D and sales functions — like having R&D work with ISC’s logistics group to optimize design of new products for easy shipping.

**Midterm grade: B+.** ISC has harmonized and standardized end-to-end supply chain processes for making and shipping products across all IBM business units — a significant effort. But it must now expand the scope of these processes across all IBM brands to enable the integrated sales, design, delivery, and support of integrated products and services — a nontrivial amount of work yet to do.

**Work remaining:** Having achieved sales/supply chain integration within individual brands, ISC now wants to extend its opportunity-to-cash composite process to support the fulfillment of *multibrand* solutions. To this end, IBM is embarking on a Multi-Brand Enablement initiative. This process standardization initiative will create a single, trusted source of data for product and price information across all IBM brands, for use by ISC’s Customer Fulfillment teams worldwide.

**3. Extend supply chain principles to IBM’s labor-based service businesses.** ISC has already helped reduce IBM’s services businesses’ costs by more than \$3 billion over two years. As IBM transitions from a capital-intensive hardware firm to a labor-intensive services firm, it must deliver the right skills at the right place at the right time. And it must do it all profitably. Since 2003, ISC has been working with IGS — whose 180,000 professionals account for 75% of IBM’s total costs — to apply supply/demand matching techniques to human capital management and optimize IGS’ services procurement.

**Midterm grade: C+.** Last year, ISC partnered with IGS to launch an IBM-wide initiative called Adaptive Workforce to provide greater visibility of human resource demand across all IBM services businesses, including the skills required to meet that demand.<sup>30</sup> As a first step, and a major one, IBM is deploying common and consistent skills taxonomy to assess skills and talent across internal personnel and subcontractors. Such firmwide resource visibility enables better resource deployment across IBM — yielding cost-saving opportunity of \$1 billion annually.<sup>31</sup>

**Work remaining:** Despite the promising early results, it is premature to judge the full impact of ISC’s work with IBM’s services businesses. And the impact of the labor supply chain will be different for that of the material supply chain. IBM’s labor supply chain is a profit center, whereas its product supply chain is a cost center. As such, any “supply chain” improvement in IBM’s labor-based service businesses would not only bring in operational efficiencies but also drive IBM’s top line growth.

**4. Provide industry-leading solutions integration and delivery capability.** To improve IBM's ability to sell integrated solutions — made up of offerings from IBM's hardware, software, and service brands — ISC created a common solutions framework anchored by three *cross-brand* solution supply chain (SSC) processes: 1) solution development; 2) solution sales execution; and 3) solution delivery.<sup>32</sup> In 2004, ISC created a new governance structure — which includes general managers of sales and heads of IBM LOBs — to monitor, manage, and optimize these cross-unit and multibrand SSC processes.<sup>33</sup>

**Midterm grade: B-.** ISC will begin to roll out its solution supply chain initiative only this year. Its success remains to be proven. But to be fair, no company has yet implemented an SSC, so ISC is embarking on uncharted territory. Even though this initiative is experimental, Forrester gives ISC a B- grade for taking the risk to pioneer the SCC field.

**Work remaining:** To build on its work-to-date, ISC is deploying a new management system with end-to-end metrics to track the performance of SSC processes. Some of these metrics expand on existing ones — like “available-to-promise” for multibrand sales execution and “on-time delivery cycles” for integrated solutions delivery. Other metrics address previously unmeasured activities — like “design-for-solution,” which tracks whether designs for new hardware, software, and service components work as interoperable building blocks that can be integrated on demand into an IBM-branded end-to-end solution. And emerging metrics will even track win rates.<sup>34</sup>

## RECOMMENDATIONS

### CEOs: MAKE SUPPLY CHAIN A STRATEGIC DRIVER FOR YOUR FIRM'S GROWTH

CEOs of manufacturing, retail, and distribution companies could transform their supply chains into profit centers. Instead, most of these CEOs tend to view supply chain as back-office operations that yield tactical cost-efficiencies. But IBM's ISC demonstrates how to leverage supply chain to drive top-line growth and achieve strategic market differentiation. To follow IBM's lead, forward-thinking CEOs must:

**1. Appoint a chief supply chain officer (CSCO).** It's time CEOs elevate supply chain relevance on par with IT and finance by appointing a CSCO. Only 25% of manufacturers and retailers now have an enterprisewide supply chain strategy that is integrated into their business strategy.<sup>35</sup> This is due in large part to the fact that few firms have a C-level exec akin to the CIO or CFO accountable for end-to-end supply chain performance.<sup>36</sup> Growth-seeking CEOs will create CSCOs and extend their oversight beyond traditional supply-side activities to include sell-side functions like customer service and support. And because of the high dependency on technology and the strong need for tracking and measuring performance, CEOs looking to promote from within will consider execs with strong IT and/or finance backgrounds.

- 2. Pitch supply chain transformation to Wall Street.** Rather than heralding the bad news, smart CEOs will do what IBM's Sam Palmisano did: have their CSCO participate in their firm's annual strategy meeting with Wall Street analysts. There, they can describe the *positive* impact of supply chain transformation initiatives on shareholder value. For most firms, the only time investors hear about a firm's supply chain performance — or lack thereof — is when CEOs report an operational glitch like parts shortages or logistics snafus. And announcing these problems can trigger as much as a 20% drop in a firm's market cap and destroy up to 12% of shareholder value.<sup>37</sup>
- 3. Bridge disconnect between sales and ops.** To sustain cross-functional integration, CEOs must implement and enforce companywide supply chain performance metrics that value both operational excellence *and* customer satisfaction. CEOs can't expect to match supply to increasingly complex customer needs as long as supply chain operations and sell-side activities are disconnected. Flexibility-seeking CEOs will do what Procter & Gamble's A.G. Lafley and GM's Rick Wagoner did: institute a CSCO-headed governance structure to oversee the design, deployment, and operation of composite processes that link supply chain and sales — such as proposal-to-contract-closeout or order-to-delivery.
- 4. Optimize the supply chain to deliver solutions — not just products.** CEOs of manufacturers and retailers eager to make services the core of their profit base will recast their product-centric supply chain to support the design, delivery, and support of integrated solutions. Services brought Home Depot \$1 billion in revenues in Q3 FY 2004, and GE expects its services to yield \$60 billion in profit over the next five years.<sup>38</sup> To get started, CEOs will ask their CSCO to overhaul their aftermarket service functions — such as warranty, field service, and maintenance. They will then integrate them with their product-centric activities like engineering, manufacturing, sales, and marketing.<sup>39</sup>
- 5. Ask CIOs to Web-service-enable all supply chain processes.** CEOs can't expect their supply chain to deliver business adaptability and build deep customer relationships if the supply chain processes are cemented by rigid IT infrastructure. CEOs eager to transform their firm into a sense-and-respond Organic Business — or what IBM calls an on demand business — must get their CIO and CSCO to execute an IT strategy for transforming monolithic supply chain *processes* into loosely coupled supply network *services* anchored by a service-oriented IT architecture.<sup>40</sup>

## WHAT IT MEANS

**ISC ANCHORS IBM'S SUPPLY CHAIN PROCESS INNOVATION NETWORK**

ISC is leading IBM's supply chain transformation to buttress IBM's evolution into an on demand business. But as Palmisano indicated at the NII Summit in December 2004, on demand businesses can't sustain growth unless they innovate.<sup>41</sup> And increasingly, firms can't innovate by relying on the old do-it-all-yourself model. Instead, successful innovation requires that intellectual resources be redeployed in the context of "innovation ecosystems" — what Forrester calls Innovation Networks.<sup>42</sup>

In the next decade, Forrester expects ISC to play its role in supporting IBM's innovation-led growth strategy by spawning a Supply Chain Process Innovation Network. Even without ISC, IBM is already migrating to Innovation Networks. For instance, IBM is encouraging open software innovation to support its infrastructure technologies by giving away 500 patents to the open source community — the first steps in spawning a Software Innovation Network.<sup>43</sup> And Chinese transformer Lenovo adds low-end PC innovation to IBM's Hardware Innovation Network.

ISC's part in IBM's Process Innovation Network will include multiple roles — as:

- **Inventor.** By developing and, where appropriate, patenting its business process ideas and technology inventions, ISC will enrich IBM's already extensive intellectual property (IP) portfolio.<sup>44</sup> ISC plans to continue inventing dozens of supply chain process best practices for saving costs, generating cash, and boosting customer satisfaction. Forrester also expects ISC to co-develop sense-and-respond supply chain algorithms with IBM Research's Mathematical Sciences team — like SCORPIO, a set of dynamic production scheduling routines.<sup>45</sup> And after attending The Value Chain Innovation Center that ISC is building with IBM Research, Moffat wants *every* ISC employee to become an inventor.
- **Transformer.** Internally, ISC is applying its supply chain inventions to transform IBM's service businesses. And to drive revenue, ISC is rolling out Business Growth Initiatives (BGI) to help IBM clients transform *their* business processes. Forrester also expects to see ISC's domain experts to increasingly act as transformers in BCS-led consulting projects. ISC has already delivered 100-plus BCS client engagements globally, with contracts valuing more than \$600 million.<sup>46</sup> The goal? To apply ISC's assets, talent, and ideas to improving IBM clients' performance in areas like procurement, engineering, supply/demand matching, logistics, and customer fulfillment. Ginni Rometty, head of BCS, estimates that the opportunity for these and other such business performance transformation services (BPTS) is worth as much as \$500 billion!<sup>47</sup>
- **Broker.** ISC's BGI team fills the role of Innovation Network broker. BGI works with IBM's services businesses to identify and capture external transformation opportunities for ISC's inventions, expertise, and relationships — like brokering access by a BCS industrial client to ISC's global logistics network. BGI also scouts external ideas — like lessons learned during

BCS client engagements — that can improve ISC’s own performance. For example, BGI will help ISC leverage the spending of IGS’ procurement outsourcing organization to improve ISC’s own global procurement — by consolidating all IBM’s supplier volumes to achieve lower prices.

- **Financier.** ISC is financing external supply chain-related invention and transformation capabilities that help drive IBM revenue and market segment share gains — especially by differentiating IBM’s offerings in the market. ISC is funding research at three US state universities — Michigan, Pennsylvania, and Arizona — to simulate large-scale on demand supply chains on a networked grid computing infrastructure. And ISC also funds an advanced RFID ROI study at Michigan State University — the results of which can be transformed into a business consulting service that ISC can co-deliver with BCS.

## ENDNOTES

- <sup>1</sup> Although the on demand business pitch was destined to IBM clients, Palmisano wanted IBM to lead by example, applying the on demand attributes to itself to become a responsive, variable, focused, and resilient organization. See the October 30, 2002, Brief “IBM Charts A Course To On-Demand Infrastructure.”
- <sup>2</sup> In his message to shareholders in IBM’s 2003 annual report, Palmisano describes that IBM’s future growth will not come merely from IT inventions cranked out of IBM’s famed R&D labs but also from delivering innovations — the intersection of invention and business insight — to IBM clients.
- <sup>3</sup> Palmisano wanted to transform IBM’s rigid supply chain into an “on demand supply chain,” an IBM term for what Forrester calls an adaptive supply network — an event-driven, real-world-aware, and self-regulating supply chain. See the February 22, 2002, Forrester Brief “Executive Overview: Adaptive Supply Networks.”
- <sup>4</sup> A shortage of ceramics used in AS/400 chips hurt IBM’s sales in the second half of 2000.
- <sup>5</sup> Inefficiencies in IBM’s services business — IBM’s “labor supply chain” — added to IBM’s overall supply chain cost. For instance, IGS’ procurement spend — \$12 billion — accounts for almost a third of all IBM supply chain spend.
- <sup>6</sup> In 1999, software and services accounted for 54% of IBM’s revenue, while hardware covered about 40%. And the most recent figures — pre-Lenovo — were about 64% and 32% respectively. The company’s 2004 fourth-quarter performance reflects this change. Revenues from Global Services increased 10% to \$12.6 billion. Big Blue signed services contracts totaling \$12.7 billion and ended the fourth quarter with an estimated services backlog of \$111 billion. Source: <http://web.mit.edu/ctl/www/news/current/crossroads.htm>.
- <sup>7</sup> ISC was created in January 2002 through consolidation of procurement, manufacturing, and logistics across IBM. But it was only in January 2003 that Moffat became its full-time SVP, and ISC’s mission expanded to include customer-facing functions. Until then, Moffat juggled two roles: heading both ISC and IBM’s PSG. Moffat successfully turned around IBM’s ailing PSG by outsourcing and leaning out its supply chain operations.

- <sup>8</sup> Moffat believes that firms shouldn't set their supply chain strategy in isolation but must design it to support their overall *corporate* strategy. Moffat says ISC's goal isn't to have the best supply chain strategy but to determine how — through which resources and processes — IBM's supply chain can most effectively help the company reach its goals.
- <sup>9</sup> Change management programs solely anchored by technology generally fail. Firms can boost the success of their business transformation initiatives by effectively aligning strategy, people, process, and technology. See the June 25, 2003, Brief "Executive Overview: Synchronized Deployment."
- <sup>10</sup> ISC sketched out its strategy — anchored by four imperatives — with input from all business units.
- <sup>11</sup> These 22 strategy champions were assisted in their cultural change management initiatives by ISC's Talent Team, which was responsible for the *deployment* of ISC's strategy.
- <sup>12</sup> ISC's Strategy Team is responsible for amending ISC's supply chain strategy — in response to external trends and/or changes in IBM's corporate strategy.
- <sup>13</sup> The centralization of the procurement function within IBM occurred during ex-CEO Lou Gerstner's tenure.
- <sup>14</sup> Moffat believed that ISC's formula for success wasn't merely centralization of IBM's supply chain functions. He felt ISC's success would stem from helping IBM "integrate, automate, consolidate, and elevate" its supply chain functions.
- <sup>15</sup> As a bonus, the brands were able to spend the last few weeks of each quarter in 2002 on value-added activities like sales instead of fire-fighting supply chain issues.
- <sup>16</sup> In December 2001, in one of the operating team meetings, Palmisano told BU leaders: "I believe I am going to create a senior vice president of supply chain, they are going to have a seat at this table, and we are going to view the supply chain as a major component to running our business." Source: "IBM's Journey on the Road to On Demand," CSCO magazine, February 2005.
- <sup>17</sup> Moffat designed ISC's end-to-end performance metrics with input from BU leaders.
- <sup>18</sup> To react to demand variability, firms need customer-focused composite processes that link sell-side functions to supply chain activities. See the June 24, 2003, Report "Helping Supply Chain Cope With Demand."
- <sup>19</sup> Out of the 26 supply chain execs in \$1 billion-plus companies surveyed by Forrester, 92% said their top priority is to improve their firm's operational efficiency, whereas only 54% are focused on boosting customer service. See the December 23, 2002, Report "SCM Processes Replace Apps: 2003 To 2008."
- <sup>20</sup> The effectiveness of these cross-unit composite processes is measured against the six ISC performance metrics.
- <sup>21</sup> ISC employees get paid on making or achieving ISC's overall goals, and for the past two years, ISC's performance bonus has scored among the highest within IBM.
- <sup>22</sup> As far as pay and benefits are concerned, ISC employees are no different from any other IBM employee. But ISC does have awards programs such as "Shoot for the Stars" to motivate, recognize, and reward individuals

and teams. Shoot for the Stars is an award that recognizes and celebrates employees who take on tough challenges, aim high, and by expecting more from themselves accomplish more than anyone might have thought possible.

- <sup>23</sup> Employees who earned the Customer Insight award made recommendations to change existing processes or metrics to redirect focus to the customer, rather than internal reporting, metrics, or reasoning.
- <sup>24</sup> To train ISC's future leaders, ISC's Talent Team is working with educational institutions like Penn State to implement a senior executive supply chain education curriculum.
- <sup>25</sup> In a survey with 22 manufacturers, Forrester found that only 41% firms have achieved positive ROI on their supply chain IT projects. See the March 18, 2002, Report "Bite-Sized SCM Projects."
- <sup>26</sup> "Sense and Respond" is IBM's framework for automating the process of monitoring and acting on business information relating to a supply chain. This framework was elaborated by IBM Research's mathematical sciences team and IBM's Advanced Business Institute.
- <sup>27</sup> ISC is part of IBM's enterprisewide transformation initiatives focused on turning the high-tech giant into an on demand business. These initiatives are categorized as: 1) process innovation to drive productivity (ISC goes in here) and client success; 2) technology to underpin IBM's transformation; and 3) people — creating a culture of collaboration.
- <sup>28</sup> IBM centralized its IT governance to ensure consistency and drive IT synergies among its enterprisewide transformation initiatives.
- <sup>29</sup> Big savings came from consolidating procurement spend across all IBM units.
- <sup>30</sup> ISC is applying to IBM's labor-based supply chain the same techniques it used to gain visibility into its product-centric physical supply chain. See the April 24, 2003, Brief "Supply Chain Visibility Defined."
- <sup>31</sup> Increased resource visibility has, for example, already helped Business Consulting Services — IBM's consulting arm — improve its workforce utilization by more than four points over 2003 levels.
- <sup>32</sup> The Solutions Delivery process enables delivery of multibrand solutions from a source of supply/service to a client location using strategic IT and logistic system.
- <sup>33</sup> This centralized governance structure is chaired by sales GM Mark Elliott and run by Lisa Koenig, who reports status of this program directly to Bob Moffat, the executive sponsor.
- <sup>34</sup> In coming years, ISC will train IBM's engineering, operations, and sales and marketing personnel across regions on how to perform against these end-to-end SSC metrics.
- <sup>35</sup> CSC's 2005 Global Survey of Supply Chain Progress gauges how successfully practitioners are advancing their supply chain capabilities. Source: [http://www.csc.com/solutions/supplychainmanagement/news/uploads/3109\\_2.pdf](http://www.csc.com/solutions/supplychainmanagement/news/uploads/3109_2.pdf).
- <sup>36</sup> In studying the member list of the Council for Logistics Management — a major supply chain association — Ohio State University Professor Bud La Londe found that only 20% of supply chain execs have a VP title. Source: <http://www.manufacturing.net/scm/index.asp?layout=article&articleid=CA311199>.

- <sup>37</sup> Professor Vinod Singhal at Georgia Institute of Technology found that manufacturers incur 20% erosion in their market cap whenever they report a supply chain glitch to Wall Street.
- <sup>38</sup> GE's 2003 annual report states that GE expects services to bring in a total of \$200 billion in revenues and \$60 billion in profit between 2004 and 2010. Home Depot's service revenues grew by 26% to \$957 million in the third quarter of fiscal year 2004. Source: <http://ir.homedepot.com/ReleaseDetail.cfm?ReleaseID=148325>.
- <sup>39</sup> To turn the aftermarket into a profit center, firms must make their service supply networks responsive — and use insights gleaned from installation, repair, and maintenance to tune upstream business activities. See the September 17, 2002, Report “Unleashing The Aftermarket's Hidden Value.”
- <sup>40</sup> Going beyond Web services to service-oriented architecture (SOA) and a broad service-oriented IT strategy greatly expands the strategic possibilities of Organic Business, creating a long-term vision of responsive, adaptive, and optimized business performance. See the June 18, 2004, Trends “The Big Strategic Impact Of Organic Business And Service-Oriented Architecture.”
- <sup>41</sup> On December 15, 2004, the US Council on Competitiveness hosted the National Innovation Initiative (NII) Summit — co-chaired by IBM CEO Sam Palmisano. The NII recommended creating a US innovation agenda to reverse the decline in America's ability to compete globally based on innovation. See the December 21, 2004, Best Practices “US Innovation Agenda Must Focus On Networks.”
- <sup>42</sup> Broader macroeconomic trends are propelling US firms into a new market structure called Innovation Networks — in which firms collaborate — as Inventors, Transformers, Brokers, and Financiers — to collectively match global demand for innovation with worldwide supply. See the June 17, 2004, Forrester Big Idea “Innovation Networks.”
- <sup>43</sup> On January 11, 2005, IBM announced that it will contribute 500 software patents — royalty-free — to the open source community, favoring the development of Software Innovation Networks. See the January 12, 2005, Quick Take “IBM Formalizes Its Software Innovation Network.”
- <sup>44</sup> With a \$5 billion R&D budget, IBM employs 3,440 researchers who generated 22,357 patents during the past decade. Ending 2004, IBM has received the most US patents for the twelfth year in a row. IBM has also brought in \$10 billion in IP licensing revenues since 1993.
- <sup>45</sup> SCORPIO's mathematical algorithms were developed by the same research team that developed the chess machine Deep Blue, which beat the world chess champion Garry Kasparov.
- <sup>46</sup> ISC has been involved in BCS client engagements such as Cooper Tire & Rubber Co.
- <sup>47</sup> Ginni Rometty, managing partner at IBM-BCS, told *Information Week* magazine that the BPTS market was worth half a trillion dollars. Source: <http://informationweek.com/shared/printableArticle.jhtml?articleID=56900493>.

# FORRESTER®

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## Headquarters

Forrester Research, Inc.  
400 Technology Square  
Cambridge, MA 02139 USA  
Tel: +1 617/613-6000  
Fax: +1 617/613-5000  
Email: [forrester@forrester.com](mailto:forrester@forrester.com)  
Nasdaq symbol: FORR  
[www.forrester.com](http://www.forrester.com)

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