

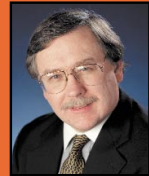
Applying digital business models

Embracing architectural change

Article Authors



Lynette Ferrara
gferrara@csc.com



Doug Neal
dneal@csc.com



Howard Smith
CTO, CSC Europe
hsmith23@csc.com

“Those who cannot remember
the past are condemned to
repeat it.”

George Santayana

Reason in Common Sense, 1905

Reengineering Redux

Get ready for a next round of reengineering. Early efforts at e-business have shown that modest programmes such as on-line catalogues and e-procurement yield modest results. Radical improvements that will delight your customers – new products and services, reduced R&D cycle time, improved customer service, drastic cost reduction – will require close and complex collaboration with customers, suppliers and other partners. You will need to work together to take time and cost out of the way you work together and to pool your understanding of your customer. Prepare to change everything: new processes, new job structures, new management systems, new technologies and sometimes a new corporate culture. Best practice no longer means a single process applied to all customers. It now means mass customisation of each and every process – the way you work and who you work with will be designed to meet the needs of each customer and market you serve.

This article is a guide for business and IT managers who believe reengineering is dead and who want to remember and learn from the past before launching a new wave of business process redesign. It begins with a reminder of the principles of reengineering articulated by Hammer and Champy, the founders of the reengineering movement; provides guidelines for applying reengineering to today's agenda of collaborative processes; and identifies the critical failure factors to avoid when launching a reengineering project.

Reengineering is a call to action to create businesses in which empowered employees focus on the customer

In 1990, Michael Hammer launched the reengineering movement with a call to use information technology to obliterate – not automate – work¹. Three years later, Hammer and James Champy published their manifesto for business revolution². Businesses were besieged by the three Cs: Customers, Competitors and Change. It was time to stop tinkering with existing ways of doing business and rethink how work was done. The goal was to focus on the customer and harness change (particularly 'disruptive' technologies) to deliver value to the customer faster and cheaper than the competition. Innovation meant new products and services delivered in totally new ways by employees who were freed from the drudgery of routine though highly specialised tasks. The truly routine tasks needed to support the delivery of value would be automated. There would be no 'standard process'.

Straightforward problems would be forwarded to generalist case workers empowered to resolve them using their best judgement and the information at hand. When they needed help, they would consult the few remaining specialists. By eliminating the time transactions spent waiting in in-trays, such changes could typically remove 90 percent of the processing time. The walls surrounding departments, business units and even the corporation itself would fall as completely as the walls of Jericho.

By the end of 1995, 69 percent of North American and 75 percent of European companies had at least one reengineering project underway³, and the rest were considering or planning reengineering. In North America, the processes most likely to be addressed were customer service, order fulfilment, and customer acquisition. In Europe, they were manufacturing, customer service, distribution, and order fulfilment. Success stories proliferated as one company after another achieved radical improvements in cycle time, cost, and customer satisfaction. Reengineering was less often applied to processes that focused on innovation and knowledge creation. However, companies such as Hoffman-LaRoche, Nynex and Sun Microsystems found that standard templates for project planning, and the use of cross-functional teams to bridge the gap between R&D, sales and production, significantly reduced the cycle time from concept to market. Few claimed to apply reengineering to management processes. And business strategy was generally beyond the reach of the reengineering teams.

1. Michael Hammer – *Reengineering Work: Don't Automate, Obliterate*, *Harvard Business Review*, July-August 1990.

2. Michael Hammer and James Champy – *Reengineering the Corporation*, *Harper Business*, 1993.

3. *Business Process Reengineering: Its Past, Present and Possible Future*, *Harvard Business School*, 9-196-082, November 13, 1995.

By 1995, reengineering was dead and had been replaced in the pantheon by ERP (enterprise resource planning) implementations led by consultants or embedded in applications⁴. Best practices – standard processes copied from industry leaders – replaced process innovation. This was in part due to the success of reengineering: consultants helped replicate newly discovered best practice within and across industries. However, in many

cases reengineering was identified with massive layoffs, a demoralised work force, and failed technology projects orchestrated by hordes of arrogant young consultants with no idea of how business or technology worked. In many companies, looming Y2K issues triggered a rush to replace ageing systems that left no time for process redesign. As a result few companies have realised the business benefits expected from their ERP projects⁵.

BUSINESS PROCESSES AND TECHNOLOGY – FROM ORGANISATIONAL CHANGE TO TECHNOLOGICAL IMPLEMENTATION

By Howard Smith CTO, CSC Europe and Co-Chair BPMI.org

Business processes are back in vogue, driven by the familiar combination of companies preparing for recession while competing for the business of customers who make extraordinary demands. The difference is that information technology, which posed so many barriers to change in the earlier days of business reengineering, now promises to serve up a radical set of solutions. These new systems define and manage business processes, orchestrating the many software application components needed to carry out routine but complex tasks such as selecting a product or service, placing orders, checking the availability of products, choosing a shipping method, assessing the credit-worthiness of the buyer, and managing payments and credits. Existing technology requires the business to design a complex process (say, order to cash, or build to order) then expects IT staff to integrate the packages and proprietary software needed to support the process. Often the business objectives of the new process design are lost in the hand-off between business and IT.

With business process management technologies, the business and IT work together to design, deploy and revise end-to-end business processes. Business process management technologies provide agility, making it easier for the business to access and use the information flowing through its network of customers, suppliers and other partners. These new technologies:

- Improve the quality of process design – analytic tools validate, simulate and enhance processes before deployment
- Reduce the time and cost of building a networked enterprise – because they build on rather than replace legacy systems, both home grown and best of breed solutions such as ERP and CRM
- Integrate from the top down reflecting the process model, not the myriad point-to-point technical interfaces that cost too much to implement today
- Improve your ability to make sense of and react to market dynamics by providing real-time metrics on process operations.

The foundation that underpins process management is the Business Process Modelling Language (BPML). This innovation led to the establishment of the Business Process Management Initiative (BPMI.org). Founded in August 2000, the BPMI had by June 2001 gathered over 125 members, including consulting firms, end users and technology companies in many categories. Some are evolving existing products towards the process management capability; others are re-examining the fundamentals of today's software architecture. If processes can be separated from software logic, as many now believe, process management systems could become the platform for process-aware applications that transact with, analyse and transform entire end-to-end business processes spanning the value chain. These applications will be very different from today's three-tier data transactional model.

4. By 1999, James Champy was unsuccessfully trying to reinvigorate the reengineering movement through articles such as an interview in the *Harvard Management Update* entitled *Reengineering dead? Don't believe it.*

5. A Conference Board Study of 117 firms in 17 countries, *ERP Post Implementation Issues and Best Practices*, December 2000.

Reported reengineering successes 1995

COMPANY	PROCESS	REPORTED BENEFIT
AMOCO	Capital Allocation	33 percent staff reduction
British Nuclear Fuels	Fuel Processing	Doubled fuel processing rate
Federal Mogul	New Product Development	Cycle time reductions from 20 percent
Ford	Accounts Payable	75 percent reduction in headcount
Xerox	Supply Chain	30 percent reduction in inventory
Rank Xerox	Billing	Cycle time reduction from 112 days to 3 Annual cash flow increase of \$5 million

Source: *Business Process Reengineering: Its Past, Present and Possible Future*, Harvard Business School, 9-196-082, November 13, 1995.

Reengineering is the manifesto for survival in today's fast changing economy

The three Cs (Customers, Competitors and Change) loom even larger in the competitive landscape as firms struggle to put in place processes that provide agility, sense making and innovation. Customers are more demanding, competitors are more aggressive and change is relentless. Disruptive technologies routinely destroy the basis of value in entire industries. Flexible networked enterprises are replacing integrated businesses: partnerships are replacing mergers, acquisitions and joint ventures. The static business contract is being replaced by more dynamic business practices. Prices, terms and conditions reflect market conditions. From computers to T-shirts, today's (or this moment's) pricing is based upon real-time analysis of consumer demand and production cost. Similar dynamics exist in the business-to-business sector.

Businesses are collaborating with consumers, suppliers and other partners to produce products and services on demand. They are searching for ways to better understand their customers' needs and to craft solutions before a competitor undermines their business. At the same time, competitors are driven to work together on industry issues from logistics operations to common technology standards that will reduce the costs of business for the industry as a whole. The core principles of reengineering provide a useful framework for action.

Business value means value to the customer (the final consumer – not another business that simply resells your product)

Hammer and Champy defined reengineering as: "The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical

contemporary measures of performance, such as cost, quality, service and speed". Reengineering focused on delivering customer value and obliterating everything else. Early reengineering projects found that customer value was produced by less than 10 percent of the processes they studied. In most businesses the overwhelming majority of the work was checking, coordinating, and handing off within and between departments – activities that delivered no value to the customer. Each step took time and introduced errors that had to be corrected and then validated once again. Reengineering therefore was the call to focus on process not functional organisation, and to use information technology to restructure what was done and how it was done. The goal was to create a new world of work where workers were problem solvers or innovators. Truly routine activities should be automated, replacing humans with machines. Everything else should be obliterated – not done at all.

Reengineering changes everything

	FROM	TO
Work Units	Functional	Process
Jobs	Simple tasks	Complex tasks
People roles	Controlled	Empowered
Job Preparation	Training	Education
Performance Measures and Compensation	Activity	Results
Advancement Criteria	Performance	Ability
Values	Protective	Productive
Managers	Supervisors	Coaches
Organisational Structure	Hierarchical	Flat
Executives	Score keepers	Leaders

A business is its processes not its products or services

Hammer and Champy proposed a radical shift: rather than defining a business by the products or services it produces, businesses are defined by what they do well. Hammer and Champy believed such a view of business knocked down barriers to growth as businesses found new ways to adapt what they did well to new markets. It also eliminated the gap between strategy and implementation since senior management no longer simply set goals but had to understand exactly what must be done to achieve these goals.

In 1993, they had to rely largely on hypothetical examples – such as the buggy whip company that might have survived the age of the automobile if it had only considered itself a producer of fine leather goods. Today, we can point to numerous businesses that are providing processes rather than products. Solectron provides manufacturing that looks and feels like an integrated production facility to its customers around the globe. Procter & Gamble provides new product launch services to others, including Coca-Cola. DuPont offers safety management services. Many companies are creating shared services organisations and taking these to market in partnership with others.

Reengineering is never finished

Hammer and Champy viewed reengineering as more than a one-time event. The goal of a reengineering project was to create a new business design – an operating model that they represented as a ‘business diamond’ that encompassed processes, organisational structure, management systems and the cultural aspects (values, beliefs and behaviours), where each of the four points of the diamond focused employees on creating customer value. Once the diamond was in place, the participants would use time tested quality management techniques to improve the processes.

However, the end of a reengineering project was not the end of reengineering the business. Hammer’s later book



The Business Diamond.

*Beyond Reengineering*⁶ dedicates a chapter to the need for continuous vigilance that your business focuses on customer value. Hammer believed that businesses must plan for two types of change: evolutionary and revolutionary. Evolutionary change is process improvement – usually a quality programme managed by the process owner. The result is slow but steady improvement to the existing processes. Hammer believed that any business needed a second ‘deep’ system that focused on the future. Hammer stated: “Self-examination and self-criticism are the prime deep system values”. Revolutionary change must be led by someone not caught up in day-to-day operations who would lead a team with responsibility to learn, redesign and transition. The resulting business would look very much like GE or Toyota, where periods of incremental change were interspersed with periods of rapid and radical redesign.

Thanks to successes in reengineering, most major companies have eliminated much of the inefficiency within their businesses. A recent CSC study of the automobile industry found that the auto makers and their suppliers were extremely efficient in the work conducted within their businesses. However, they could cut the cost per car by \$5,000 through better collaboration between consumers, suppliers and other partners. The largest target for reengineering in such companies is logistics from factory to dealer. Once a car comes off the production line, it disappears from view for 19 days while in transit to the dealer. A radical redesign of the logistics process would cut costs and provide the consumers with the car (make, model, colour, accessories) they want, when they want it.

6. Michael Hammer, *Beyond Reengineering*, HarperCollins Publishers, 1996.

Today's reengineering should build on the lessons of the past

The current round of reengineering begins in a more promising technical and cultural environment. Over the past decade there has been rapid development and deployment of technologies to support collaboration. The Internet, e-security, communications standards and countless miles of high bandwidth cable mean that connecting and collaborating is easier than ever and improving constantly. Business process management technologies provide the sophisticated tools to design, deploy and monitor processes across businesses' boundaries⁷.

As importantly, your customers, suppliers and employees are ready, willing and able to use the technology. They train on their own time while surfing the web or communicating with friends and family.

However, the expectations of these customers, suppliers and employees have risen as well. Each customer – whether consumer or another business – wants the latest in goods and services customised to his requirements at the best possible price. Customers want to work with you in ways that reflect their markets and their culture. Far from having a standard process (and using a specialist for difficult cases) you will need to deploy alternative processes with different partners for key customers. Instead of fixed contracts, we will see dynamic pricing: your prices and product or service features will vary with customer demand and the cost, availability and quality offered by your suppliers. To stay competitive, your business will measure the effectiveness and efficiency of its processes in real time using techniques such as activity based costing.

In addition, multiple businesses develop and manage multiple types of partnerships. It will take many years of successful partnership to create a shared framework for working together and for supporting and managing employees who may spend more time collaborating with partners than with the business that pays their salary.

As you begin this round of reengineering you must build upon lessons learned from past reengineering projects.

1. Focus on customer value – one customer or customer segment at a time

Using a reengineering methodology to redesign processes focuses attention on the consumer – the often forgotten or poorly understood individual who buys and/or uses your product or services. That customer's needs, wants and concerns become paramount. The choice of goods to sell, features to add, and processes used to sell, take orders and provide service, must be rooted in the customer's requirements. Your goal is to understand the customer better than the competition and to build a collaborative dialogue with each customer that will enable you to be first to market, time and again, with products and services uniquely packaged for that customer.

Everything else – your products and services, processes and pricing and the choice of partners to develop, produce and support your products – are subordinate to the customer's needs. As a minimum, your objective will be mass customisation where you configure your offerings to order. At best, you produce to order choosing the specific set of partners that will enable you to meet each customer's requirements.

Therefore, this round of reengineering will differ from your past efforts in two ways. First, this round of reengineering will require you to focus outward rather than inward. In the US automotive industry, the target may be eliminating the 19 days in which cars 'disappear' as they are shipped from factory to dealer. In the grocery business, grocers and their suppliers may strive to improve the shopping experience for their customers, who fail to get all the products they want in supermarkets (in store or online) forty percent of the time. Second, prepare to manage many different processes supported by many different technologies. The objective is not to develop a single best practice process that you apply to all customers. You will now mass customise your processes – the way you work and who you work with to meet the needs of each customer and market you serve. Your competitive edge will be your flexibility to manage many very different processes and your agility in changing processes as fast as your customers and markets demand new services.

7. Past journal articles on this topic include: *The evolution of business process from description to data to smart executable code*, *Foundation Research Journal*, March 2001; and *Business Process Management: closing the gap between business intent and execution*, *Foundation Research Journal*, July 2001.

2. Automate systems, empower people: customers, suppliers, other partners

The initial wave of reengineering was a war on non-value-adding work. Then, this meant the endless dreary specialist tasks within a business that eat time and money and often introduce errors. This time the goal is to eliminate non-value-adding work between businesses. Once needless work is obliterated, everything else should be automated or assigned to empowered customers, employees and other partners.

Technology contributes in two very different ways. First, by automating the vast number of tasks that can be done by a computer without human intervention. With technically sophisticated customers or partners, you can readily deploy more complex automated processes such as payment on receipt or on use and automated reordering. The scope and scale of such automation will broaden as your understanding of the processes themselves grows. Examples include pricing based on real-time analysis of supply and demand, straight-through processing of

financial transactions, and generating and testing drug candidates against specific diseases.

The second role for technology is to provide the remaining people in the value chain with the tools and information to do their jobs. We do not mean discovering best processes and devising tightly scripted paths to implement them. On the contrary, the people must know their objectives and do what is needed to achieve them. The role of technology is to provide information on demand, analysis tools to turn data into actionable information, and a secure space to collaborate with other members of the value chain. The goal is to provide customers, employees and partners with expressive systems that allow them to express and explore the world as they see it⁸.

The people in the value chain should be doing tasks that only people can do – sense making, decision making, and innovation and using the results of these activities to build deeper bonds with the customer.

USING AUTOMATION TO DRIVE OUT TIME AND COST WHILE FACILITATING SENSE MAKING AND INNOVATION

Iowa Telecom and Tesoro Petroleum applied reengineering principles to process redesign. Both eliminated labour-intensive tasks that added little value. They then automated the integration between internal systems so that the remaining people in their core processes focused on problem solving and trouble shooting. Millennium, Toyota and BMW automated R&D tasks to allow their scientists and engineers to focus on sense making and innovation.

Iowa Telecom improved customer service and reduced the order to cash cycle by eliminating swivel chair integration

Iowa Telecom is a local phone company with more than 280,000 subscribers. One of its most difficult problems has been handling all the transactions involved in responding to customer requests to switch long distance carriers. It was also losing revenue because of the length of time it took to process billing name and

address change requests from the long distance carriers. The root of both problems was the labour-intensive process by which information was passed between multiple systems.

Investigation revealed that most of the delay was in 'swivel chair integration': people rekeying data from one system to another. Using business process management software from Fuegotech (www.fuegotech.com), the process was recast so that more than 80 percent of the work was fully automated and exceptions were routed to skilled staff for resolution. Headcount for the manual activities was reduced by 88 percent. Cycle time for processing a request was reduced from five minutes to less than five seconds. A backlog of 25,000 name and address changes was eliminated. All this was accomplished in two and a half months with payback of the investment in eight months – less time than it would have taken to build the solution using an EAI approach.

8. Richard Pawson's book *Expressive Systems: A manifesto for radical business software*, CSC Research Services, 2000, provides a guide to the design and development of business software that empowers rather than enslaves.

Since the initial installation, Iowa Telecom has continued to add capabilities to the system. As it learned more about the overall process, it has been able to automate the handling of progressively more difficult transaction codes. Typically these changes are made at the level of a visual diagram which can be understood by technical and business staff alike. Then XML is generated and turned into Java code that is deployed on the business process management system server.

The initial problem at Iowa Telecom was systems integration. In future the CIO, Brian Naaden, expects to make significant use of the business process management system as a way to make business processes explicit, measurable, and changeable. In contrast to telephone companies with a long history, Iowa Telecom is a new start-up company that was formed to purchase the Iowa assets of GTE, which wanted to quit the market. With its mix of old and new staff the company does not have the implicit processes, good or bad, of an established company. Iowa Telecom has the opportunity to consciously decide how its processes should work. The business process management system will help it make them explicit and document the results.

An initial success convinced Tesoro Petroleum to launch an enterprise-wide process redesign programme

Tesoro Petroleum is a \$5 billion energy company. Like many companies in the energy business, it has implemented SAP. However, this did not provide appropriate support to the part of the business that re-supplies boats servicing the drilling rigs in the Gulf of Mexico. When a boat pulled into to one of the Tesoro provisioning docks, the workers had to enter 50 to 70 mouse clicks over 13 to 15 screens. The training required was too extensive for the dock workers. Using business process management software from Fugotech, Tesoro was able to put more intelligence into the order entry system, use familiar names and shrink the system to three screens. In the background the business process management system orchestrates 14 SAP transactions and updates non-SAP systems. The pilot was up and running in five weeks.

Tesoro's CIO, Mark Evans, is now developing a programme of change using business process management. He expects to make use of this technology

on 15 other projects including one with significant revenue implications that will link a variety of systems and sources to improve Tesoro's pricing operation.

Based on his experience, Mark Evans believes that in the future Tesoro will need business process architects and projects managers, but all else will be outsourced. However, these business process architects do not exist today and will need to be grown within the company. Mark recognises that this will require strong leadership on his part, to set the example. Fortunately Mark had good teachers in his previous position at Phillips Petroleum where IT staff were trained in two important disciplines – how to think in business process terms and how to talk to business executives. This is highlighted in a famous Harvard Business School case study describing how Phillips mobilised its resources to dramatically increase its profitability in response to a business threat.

The new business process architects will not only sit with business staff to design new processes, but will work with both sides of intersecting processes to help diagnose and sort out process interaction issues. For Tesoro this clarity about what all participants in a process actually do may be one of the most important benefits of explicit process management. Previously when things went wrong between departments or between partners there was very little shared understanding of what each side did. Now with explicit visibility into how others in a process do their work there is much less misunderstanding and the root cause of issues can be quickly sorted out.

Integrating automation into the research and development process gives scientists and engineers time for creativity

Stefan Thomke⁹ studied the role of new technologies such as computer simulation, rapid prototyping and combinational chemistry. He found that companies including Millennium, Toyota and BMW used these technologies along with a well defined research process to slash the time and cost of R&D. Toyota reported savings of 30 to 40 percent in cycle time when it integrated design and manufacturing engineers into a single team that used computer-aided design and engineering tools and rapid prototyping capabilities, and so could anticipate and resolve production issues early in the design cycle.

9. Stefan Thomke, *Enlightened Experimentation: The New Imperative for Innovation*, Harvard Business Review, February 2001.

3. Build a platform for collaboration rather than for integration

The initial round of reengineering was focused on integration of the value chain. While the rhetoric was partnership and empowerment, the practice was command-and-control – treating suppliers as an extension of the enterprise. Ford built upon Mazda's experience of reducing the accounts payable process and created a small group that dealt only with the tough cases involving disputes about what was delivered when. In the new process, suppliers were paid on receipt, thus eliminating the need for suppliers to bill Ford and for Ford to process the bills and subsequently reconcile the bill with a purchase order. Later Ford changed the process to payment on use, eliminating its need to pay for inventory. Today Ford pays some vendors when the car is sold, sharing risk and reward with its suppliers even further.

In many value chains, integration is a necessary first step in cutting costs and sharing information. However, collaboration requires deeper levels of partnership with customers, suppliers and other partners. Effective collaboration requires on-going dialogue and knowledge sharing to identify and assess opportunities for new products and services and new ways of working. Static relationships defined by long-term contracts are replaced by dynamic relationships that change with market conditions, customer needs and introduction of innovative technologies.

4. Don't leave success to chance – programme and project management basics still apply

It is true that innovation, even revolution, can happen without planning and management. In many businesses, innovation projects are regarded as somehow immune to the rigours of project management. This is especially true of new frameworks for working, such as partnerships and alliances. Research finds that most of these projects fail¹⁰ – but because of poor management rather than failures of new technology or of partners. Experience shows that

new or changed processes, applications or business objectives within the company and involving partners can only be achieved using the top-down principles of business process management.

When reengineering the value chain, basic project management (setting clear goals, obtaining senior executive alignment and sponsorship, building a business case for action that delivers business value along the way in multi-year plans) goes a long way towards ensuring success. The senior management of all participants (including customers and other partners) must be aligned and support the project. This means you must articulate the benefits to each party and track your progress to make sure you are delivering. What is more, all parties to the reengineered value chain must also redesign their business systems to support collaboration.

Most innovation projects fail because of poor management.

When processes are radically redesigned to use new technologies, other components of the business diamond (jobs and structures, values and beliefs, and management and measurement systems) need to change as well. Providers of BPM software are finding innovative ways to manage change in the human dimensions of reengineering unobtrusively as processes are automated.

Transforming your business to a networked enterprise will require years of effort. The goals are sweeping and get more ambitious over time. The technology is complex, expensive and evolving as rapidly as your business' appetite for change. The challenge is to keep your process designs synchronised with what technology can deliver and your people can absorb. Most IT organisations already have experience of equally massive programmes, and have found the answer is programme management: well defined business and IT architecture based on components that can and will change with business requirements and advances in technology. The more difficult issue for many organisations will be keeping technology synchronised with the capabilities of the people – customers, suppliers and

10. *Technology driven innovation: are you seeing clearly?*, Foundation Research Journal, November 1999.

employees – who use it. This is quite different from old user interface issues (when the goal was to entice the user to interact with the system). These are information competency issues. They are about developing the skills to analyse and interpret the masses of information flowing through the value chains.

5. Develop information systems to support both continuous improvement and radical change

Processes exist to deliver value to customers. Not surprisingly the process must change as the customers' needs change or when new technologies provide the opportunity to provide better products or services or to offer completely different value propositions.

One key role of information systems is to allow the business to monitor its processes and the market to identify and resolve problems before they become business-threatening. The goal is both to provide real-time information about what is happening and to simulate alternative market scenarios. The strategy and operations simulation laboratory will become the nerve centre of the business.

Today's reengineering projects need not repeat the mistakes of the early 1990s

Cost reduction is a good outcome but a poor objective

In many businesses, the by-products of reengineering (such as lower costs, flatter organisations and lower headcounts) were defined as the objective of reengineering. Once these results were achieved – often by

across-the-board layoffs – the programme was declared a success and the remaining employees were left to struggle with their anger and guilt, and little training or technology to support the new ways of working.

The true objective of reengineering is to improve delivery of value to specific customers. The metrics of success should reflect the value to the customer: more and better functionality, improved or more flexible service, shorter delivery times, innovative products and services customised to each customer's requirements. This should in turn lead to good outcomes for your business and its partners: lower costs of production and sales, lower inventory and/or logistics costs, higher prices for what the market considers premium products or services, and higher sales to existing and new customers. These outcomes for your business flow from the benefits you provide your customers. Without that link to customer value, they do not provide sustainable competitive advantage.

Acknowledge the central role of technology (and technologists) in process redesign

Hammer and Champy lauded technology while dismissing technologists, particularly internal IS leadership. *Reengineering the Corporation* contains a chapter on how 'disruptive' technologies can create new ways of working. It recommends that businesses look at IS inductively – explore new solutions and use them to drive change in the business. However, the reengineers did not include technology staff in redesign efforts.

CISCO HAD EVERYTHING BUT A STRATEGY SIMULATION LABORATORY

On April 30, 2001 Cisco announced its first drop in sales and profitability. Sales were down 30 percent. More importantly, the company with one of the world's most transparent supply chains announced that it would write off \$2.2 billion of inventory. Cisco had listened to customer complaints of delays due to production bottlenecks of scarce components. It had not considered that past customer demand might not be a good indicator of future behaviour. Despite the richness

of the supply chain information available, Cisco failed to carry out some basic scenario planning: What if one market segment – such as the dotcoms – suddenly ceased to buy or went out of business? What if another sector, say telecoms, also stopped buying? What if the remaining customers suddenly could buy Cisco gear still in the box for a tiny fraction of the Cisco price? The result was a drastic drop off in investor confidence and stock price that may threaten the company's ability to survive.

They were dismissive of IT efforts to automate the business or software engineering as efforts to replace tired, ineffective systems with more efficient systems.

As a result, many of the radical new process designs outstripped the ability of the technology to deliver the new applications or the infrastructure to support them. Processes dreamed up in a process action team room required new systems, new user interfaces, and new devices for collecting and delivering information. Users from senior executives to customer service clerks were asked to take on radical new ways of working with systems that were poorly designed, under funded and under supported. The gap between IS and the business opened wider.

In 1997, CSC Research Services completed a research project that documented the role of IS in creating business value by enabling dramatic improvements in business performance. Internal IS staff were encouraged to play a leading role in reengineering by taking on business as well as technology roles. This report¹¹

encouraged IS staff to join the process teams and to take a leadership role by orchestrating or even leading them. IS became the centre of the business diamond. The role of IS was to provide a seamless foundation for business transformation – which appeared a bit far-fetched even to the authors of the report.

THE FUTURE ENVIRONMENT FOR BUSINESS TRANSFORMATION

- Infrastructure is pervasive, resilient and expressive
- A permanent business change lab enables ongoing innovation and transformation
- Rollout of change occurs instantaneously

From CSC Foundation Report *IS at Work in Business Reengineering*.

Today, emerging business process management technologies and standards have made that vision readily achievable. What was once a far-fetched vision is rapidly becoming benchmarked best practice.

ABOUT BPMI.ORG

The BPMI.org (Business Process Management Initiative) is a non-profit corporation that empowers companies of all sizes, across all industries, to develop and operate business processes that span multiple applications and business partners, behind the firewall and over the Internet. The Initiative's mission is to promote and develop the use of Business Process Management (BPM) through the establishment of standards for process design, deployment, execution, maintenance and optimisation. BPMI.org develops open specifications, assists IT vendors in marketing their implementations, and supports businesses in their use of business process management technologies. BPMI.org was initiated by Intalio, Inc. and created in August 2000 by a group of sixteen enterprise software vendors and consulting firms, including Computer Sciences Corporation. Membership is open to all companies, non-profit organisations and individuals.

Key aspects of Business Process Management include:

- Business processes can be modelled end to end, not limited to standard public interfaces between companies. Processes deeply embedded in

applications and work practices within a business can nevertheless collaborate with similar processes in partner organisations.

- Processes are deployed top-down, from a business-level process blueprint. They are not constructed through bottom-up technical integration. Process changes and customisation are similarly handled by modifying the upper level process designs.
- Process management can be logically centralised, providing a 360 degree view of the business' operations. Process execution can be physically distributed, yet retain transactional integrity even across long-lived processes.
- Process management like other successful enterprise software strategies is built on standards and architecture, in particular, Business Process Modelling Language (BPML) and Business Process Query Language (BPQL). Business Process Management Systems (BPMS) provide the infrastructure that implements these standards.

11. CSC Foundation Report, *IS at Work in Business Reengineering*, 1999.

Don't confuse ignorance and arrogance with creativity

A main theme of reengineering was that it could be done by generalists with little or no knowledge of a process. The very lack of knowledge of how the process was 'supposed to work' was said to free the reengineering team to break rules and make changes that those who lived with the process could not see, and their 'open minds' to create an atmosphere conducive to innovation. In practice, young consultants with no understanding of the industry, its customers or the available technologies were unleashed on hapless customers. 'Innovative design' meant what they had read in the Wall Street Journal or used in their last assignment. Creative cooperation within the team, creating a new process out of the experience of the business, knowledge of IT and cross industry experience of the consultants, rarely occurred. As a result, the new process designs were unoriginal and showed little understanding of how they would impact the business. As importantly, the consultants (not their customers) owned the new design. Not surprisingly, support for the redesigned processes evaporated when the consultants left. Without a process management environment, this was inevitable. New process management tools should help eliminate this pitfall by providing a centrally managed infrastructure in which everyone involved in the process reengineering can work together.

Build your process redesign team for effective creative collaboration¹². Begin with a preliminary view of your customer's requirements, and work with your customer to verify them. As the requirements are defined, build a team of experts – technologists, designers, marketers, production engineers and finance experts – who can work together to create the unique value proposition for the customers. Relevant expertise – not the employer – should determine who is on the reengineering team. Expect to have a core team made up of customers, suppliers and other partners. Align corporate and team objectives so that all team members focus on the team rather than the corporate objective.

Automate process; support practices

With the rallying cry of obliterate not automate, process redesign teams replaced humans with computer systems, then defined the requirements for systems to support the remaining employees as they took on more and more tasks. Applications were supposed to provide intelligent generalists with the information and analysis tools to solve problems formerly relegated to specialists. Only the really difficult or new issues were now referred to specialists. The rush was on to automate functions such as customer service, internal help desks and sales.

John Seely Brown¹³ and others have documented the results: systems that ignored the complexity of problems and the corresponding need for employees who could diagnose problems and solve them. Too much attention was placed on communicating what needed to be done when (process) and too little time was spent on understanding how the work is done and why (practice). People became drones who lost the ability to improvise. Worse, customers had to interact with employees who had little control over what information was available to them or the way they approached problems. Consumers began to recognise that dreaded half-second pause when they picked up a phone that indicated a telemarketer equipped with a demon dialler was about to read a script. With less empowerment, not more, employees became bored and cared less about the company or its customers.


Demolish the walls of Jericho – don't just shake them

In theory, reengineering was rooted in a deep understanding of the consumer, and constructed an end-to-end process to provide value to the consumer. Reengineers, like latter day Joshuas, knocked down the walls around businesses, and within them.

In practice, consumers, suppliers and partners were rarely involved in the redesign. Most companies experienced great difficulty tearing down walls between departments and business units. Labour and management were

12. *Partnering with your IT Vendors*, Foundation Research Journal, November 1999.

13. In Chapter 4 of the book, *Practice Makes Process of The Social Life of Information*, John Seely Brown and Paul Duguid point out that most reengineering projects made little effort to understand how work gets done or how people learn to do it. As a result reengineered systems told people what to do when and provided no support when the proffered remedy did not work.



reluctant to add customers to the redesign teams. The goal was to get the house in order, then access the outside. Also the team – or its consultants – felt they knew the customer. New process designs moved inventory around the value chain by requiring the supplier to meet new ‘just in time’ delivery goals. The suppliers were told their new responsibilities and the new technologies they were required to use. In most cases, just in time delivery meant that inventory moved from one company’s books to another: cost was moved round the supply chain, not eliminated.

Reengineering the business instead of the value chain reflected both the limitations of existing technologies and the command-and-control cultures of most large companies. While many corporations were reluctant to open their processes to customers and suppliers, the technology of the early 90s was too expensive and complex to support open communication and collaboration in today’s dynamic supply chain practices. Proprietary EDI systems were complicated, expensive and only oriented to simple trade processes, not the rich forms of process inherent in all businesses. Dial-up connections were expensive and difficult to maintain and the open communication standards of the Internet were not available. As importantly, users were not ready to work electronically. Personal computers were isolated islands. The Internet revolution (in which users trained themselves to use technology as they surfed the web or chatted online with their children and grandchildren) was a half a decade off. Security and reliability were not an issue since new systems were deployed within not outside the corporate walls.

What’s next? Prepare your IS organisation to lead reengineering

The next round of reengineering is too important to leave to consultants or software vendors alone. Your business needs your expertise and an IS infrastructure to

support design, deployment and on-going evaluation of new business processes. Actions you can take right now to enable change as fast as your business can refocus its people include:

- Make sure your leadership team is well versed in reengineering theory and practice
- Bring new technologies such as business process management to the table
- Act as thought leaders on the application of new technology to process redesign and as thought partners with the business and its customers and partners in helping to test new designs
- Get really good at simulating new processes in a collaborative environment with customers, suppliers and other partners
- Make sure your team focuses on working with the outside world – customers, suppliers and partners – as well as internal operations¹⁴.

Develop experience with the business and technology architecture you will need to develop and deploy business processes that cross organisational and application boundaries. The place to begin is with small proof of concept or prototype projects that allow you to explore and compare the advantages of new business process management technologies in your business. For example, use a new process discovery and design tool, and measure the advantage of capturing your processes. Another popular way to learn about this technology is to challenge several vendors to a ‘bake-off’ in which they must demonstrate the power of their technology by solving a real problem in your business.

In all of this, remember the first principle of reengineering: focus on delivering value to a customer, and not a hypothetical customer but a real customer. Don’t begin any project unless a customer is part of your project team.

14. See *Getting ready for e-business: from the outside-in and the inside-out*, *Foundation Research Journal*, March 2001 for a framework to help set your agenda.

SIMULATIONS WILL REPLACE PROTOTYPES

Today's rapidly changing markets and demanding customers will not sit still while the business deploys and evaluates alternative strategies and processes. Your business needs to get it right the first time, every time, and be ready to change in synch with the market – not after the market. Your problem is not to identify a new process, but to implement the means to change processes continuously. Amongst other things, this requires simulations that use real data to simulate processes and identify and resolve problems before they occur. Your business also needs the ability to conduct 'What if?' scenario-planning sessions and to develop alternatives rapidly when a new scenario is likely.

This is not the same as prototyping a system to confirm user requirements. It is a full simulation of what will happen when a new strategy or process is deployed – a multiplayer video game where the game winner captures your customers and your markets.

Where prototyping required a laboratory, today's simulations needed to be shareable across time and space. You need to be able to run simulations with customers and partners in a collaborative environment that allows participants in different places and time zones to view the simulation and to design new scenarios.

All business processes involve discovery, design/redesign, deployment, execution, maintenance, optimisation and analysis. Until the advent of business process management systems, the tools for discovery and design/redesign were limited in their analytical capability because they did not get feedback from live systems. Now we have capabilities that support the full 'stack' of business process management, tools like Proactivity (www.proactivityinc.com) become significantly more powerful. Changes in design can now be connected directly with changes in results. This opens the door for powerful analyses of how processes really work, without the effort involved in (for example) activity-based costing. It used to be so hard

to capture data about process execution that it was only done once. Now, data about process execution is routinely carried along with the process.

As routine analysis becomes easy, the base will be built for understandings that will support simulation of likely consequences even before the process is deployed.

In the future, much more data on process execution will be available. Already firms like Tilion (www.tilion.com) provide non-invasive ways for supply chain partners to gain deep visibility into how things are going, not just see when a part will ship. This visibility is expected to result in new and frequently changing ways in which business processes are executed. Optimisation will no longer be just within the walls of a single company, but deployed across multiple companies. The relentless search for new and improved processes will be a major focus of attention. And when a new possibility has been identified, business process management systems will make it possible to capture the benefits.

