

## Revisiting Reengineering

Heralded as the corporation's savior, BPR was later condemned as a heartless, failed management fad. But perhaps evangelists like Michael Hammer needed to go even farther.

**T**he management fad with the greatest reputation for arrogance is also the one most prone to *mea culpas* by its leaders. Beginning in 1995, the three most influential founders of business process reengineering (BPR) — former Massachusetts Institute of Technology professor Michael Hammer, then-University of Texas professor Thomas Davenport, and James Champy, then-president of the consulting firm CSC Index — all issued public apologies. This was only eight years after they had coined the word “reengineering,” and only three years after Dr. Hammer and Mr. Champy’s book, *Reengineering the Corporation: A Manifesto for Business Revolution*, had become a runaway bestseller. In that scant time hundreds of companies had leapt onto the bandwagon of BPR: the radical redesign of corporate processes (from order-taking to procurement, from product development to customer service) with the goal of dramatic breakthroughs in performance.

Process redesign initiatives, of course, had existed on the management scene long before “reengineer-

ing” came along. The methods that Messrs. Hammer, Champy, and Davenport proposed were not very different from those of such old management luminaries as Russell Ackoff, Eric Trist (the theorist of sociotechnical systems), Joseph Juran, and W. Edwards Deming. Process redesign is a nitty-gritty exercise in rethinking the flow of work and information. And its methods can, in fact, work miracles, especially in companies split into functional “stovepipes” and “silos,” where R&D, marketing, and operations people have been isolated from one another.

Like the quality and sociotech movements, reengineering showed that business processes worked best when designed as a single, inter-related system. But the quality and sociotech movements invited people on the shop floor and in the back office to gradually improve their work together. To the reengineers, there wasn’t time for incremental change; the frenetic pace of the business environment demanded that managers adopt a “blank sheet of paper,” torpedo the old, wasteful, bureaucratic processes, and redesign everything from scratch.

In principle, Dr. Hammer said, a

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whole reengineering effort should take less than a year, and he offered examples of creaky old hierarchical dinosaurs that suddenly became as nimble as greenfield startups. In practice, however, reengineering generally meant turning over process design to teams of outside experts and information technologists, with a mandate to cut fat, particularly payroll expenses, from the corporate budget. By 1994, a \$50 billion consulting industry had developed around it. The redesigns that worked, worked well; but the vast majority didn't work. A series of studies in the early 1990s established that 70 percent or more of reengineering initiatives had actually made things worse: They bred confusion, delays, resentment, and screwups. As reengineering projects led to crises, and as jobs were eliminated, often without much subtlety or consideration, Dr. Hammer himself became an unwilling symbol for downsizing, and reengineering triggered a ferocious middle-management backlash.

So it was that Dr. Hammer admitted error in an interview in *The Wall Street Journal*, Mr. Champy apologized in an article in *Across the Board*, and Dr. Davenport wrote a confessional cover story for the premiere issue of *Fast Company* maga-

zine. All three said essentially the same thing: Amid the fervor of revolutionary change, they had forgotten about people. "The last thing that I would have ever imagined," Dr. Davenport later recalled, "was that people would start losing their jobs because of some ideas that I was offering."

Today, conventional wisdom says that reengineering failed because it went too far. But if you look below the surface, it's more persuasive to say that reengineering crashed because it didn't go far enough.

Any management change initiative is really a philosophical statement about the nature of human activity; its success or failure depends primarily on the rigor, depth, and quality of its insight. And like many management consultants, the gurus of reengineering weren't complete as philosophers. They got so caught up in marketing their products that they never quite followed through on the intellectual underpinnings that gave those wares meaning and that indeed could have led to significant and highly beneficial change. Reengineering was a great lost opportunity for American industry.

When I said as much to Michael Hammer recently, he replied, "It's not entirely lost yet." And he's right. As

value chains and supply channels prove inadequate to the demands of e-commerce, there are rumblings of a reengineering revival. Managers are starting to clamor again for a "blank sheet of paper" — not only within companies but between them. But that doesn't mean the reengineers should be complacent. Those who cannot learn from the first round of reengineering calamity may be doomed to repeat it on a larger scale.

### From Hacker to Hammer

Reengineering was born in the mid-1980s, when Messrs. Hammer, Champy, and Davenport began working together in Cambridge, Mass. Mr. Champy, a cofounder of the Index Group, a small IT-oriented consulting firm not yet merged with Computer Sciences Corporation, was a well-liked rainmaker with a civil engineering degree from MIT. Dr. Davenport was a humanist academic sociologist intrigued by business; he had been about to restart his career by getting an MBA at MIT when Mr. Champy offered him a research and consulting job at Index. Dr. Hammer was an MIT computer science professor with his own consulting firm in the same building as Index.

Dr. Hammer's research on databases and office automation specialized in the problems of computer-human interfaces. He was on the fringes of the famous MIT "hacker" subculture, the Chinese food-craving all-nighter-pullers who helped create today's personal computer industry. Dr. Hammer himself had the personality of a hacker — earnest, literal-minded, a bit childlike and otherworldly, and intensely contemptuous of the unnecessary impediments of mainstream bureaucracies.

By the early 1980s, he had become disenchanted with computer

science. He found the real-world dilemmas and opportunities at companies like Citibank and Xerox much more interesting than his academic research. He resigned his MIT professorship and began working closely with Index on joint projects, particularly with Dr. Davenport.

While studying office automation, the Index researchers shrewdly began to compile a data bank of workflow redesign anecdotes. For instance, some Ford Motor Company managers had discovered, after acquiring Mazda, that Ford had 500 accounts payable clerks where Mazda had only a handful. The only difference was Ford's invoice process, which the company had never questioned. By cutting it, Ford eliminated three-fourths of its accounts payable staff.

To Messrs. Hammer, Champy, and Davenport, such stories represented the foundation of a compelling new kind of consulting practice. Dr. Hammer coined the name "reengineering" in 1987; Index adopted it after rejecting "transformation," which sounded too touchy-feely. "Reengineering" was hard, tough, masculine. By 1990, Dr. Hammer knew that reengineering would be a huge hit from the way his first tentative presentations electrified audiences. From there grew articles and books, lucrative consulting, and the climactic peak of the mid-1990s.

The early champions of reengineering were information technology departments; their huge computer investments had never achieved the kind of payback they expected, and now they finally had a corporate imperative to redesign the whole organization to match the information flow of their computer systems, instead of the other way around. It also appealed to corporate innovators,

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struggling against new forms of competition. Instead of accommodating old bureaucracies, they could simply get rid of those outdated parts of the process and feel virtuous in the bargain.

Ultimately, reengineering was most seductive to senior executives. CEOs sensed their old command-and-control techniques no longer worked, especially for changing the direction of the company. But they weren't ready to give up authority and move toward a more self-managing system. Reengineering gave them a way to command without the tedium of controlling; instead of telling people what to do, they could simply set up processes that, in effect, programmed the whole company.

Few of these people wanted to

hear about intellectual roots. They just wanted results; the easiest way to measure them was staff reductions. Dr. Davenport first realized the monster he had helped create around 1994, during a consultation with Pacific Bell: "They announced that 10,000 people would be laid off through reengineering. I knew that they were nowhere near the point with their process designs where they could figure out how many people would be needed to do the work."

The three founders of reengineering have moved on. Dr. Davenport went to Ernst & Young, then to the University of Texas and to Andersen Consulting, where his practice now focuses on knowledge management and large-scale information systems; his book *Information Ecology:*

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*Mastering the Information and Knowledge Environment* (with Laurance Prusak) is a paean to the value of human informality and messy irrationality in large-company systems design. Mr. Champy — an elegant, genial rainmaker who never had much to do with the nuts and bolts of process design — is now the chairman of Perot Systems' consulting practice. Dr. Hammer is the head of his own Cambridge firm, Hammer and Company, and is still convinced that his persistence to reinvent management will inevitably change the world. In his view, it already has.

### Technocratic Roots

"The management ideas that get picked up by the marketplace," Dr. Davenport said recently, looking back

on the reengineering boom, "are the ones that resonate with the zeitgeist. Guys like me and Hammer just kind of throw this stuff against the wall. Some of it sticks and some doesn't."

But there was a reason the zeitgeist responded to this particular management fad. Implicit in the reengineers' method, but only vaguely and occasionally voiced, was an extremely powerful idea whose potential still has not been realized. Organizations are machines. To be sure, this idea has been programmed from the top down. This has been the starting point for many abusive systems over the years, from Frederick W. Taylor's "one best way" to the Soviet Union's five-year plans to the Rand Corporation's innovations in systems analysis that ultimately led, through Robert

McNamara and Alain Enthoven, to the doomed policies of the Vietnam War and the Great Society. But while reengineers like Dr. Hammer unwittingly echoed these traditions, and they sometimes fell prey to the same hubris, they also moved beyond it into the post-industrial realm.

For a corporation is not just an ordinary machine. It is like a complex computer system, an intricate form of artificial life running on thousands of brains networked together. In that context, a reengineering plan (or any process design) is an algorithm. The computer is the company. The bits are people. The routines are business processes. The operating system is the organization's culture. And you can program corporations as if they are giant multiprocessor computers.

When I first suggested the analogy to him several years ago, Dr. Hammer agreed, but added that, "The pieces are more complex and subtle in real life. As yet, they can't readily be automated. Maybe in 500 years." In other words, he recognized the dangers of the machine metaphor — but fell prey to it anyway.

Yet Dr. Hammer, of all people, could have avoided the danger. As a student of computer science, he is heir to a tradition that might still provide a way out.

For 50 years, information theorists have struggled with the problem of translating real life into binary code and back again. The result has been a theoretical discipline of software design, grounded in what Yale computer scientist David Gelernter calls "machine beauty": the theoretical correspondence between simplicity, power, and elegance. Prof. Gelernter argues that this is not true just for software engineering, but for civil engineering (consider the simplicity and elegance of the arch).

In computer science, this idea has led to several interrelated concepts: the elegance of using one line of code to solve several different tasks; the concept of recursion, in which processes develop a kind of mathematical self-awareness; the idea of the “mythical man-month,” where adding two more people to a software project can quadruple the headaches, because the number of relationships among people rises at a much faster rate. And the emphasis on understanding abstract structure championed by software theorists like Edward Dijkstra and Donald Knuth.

Much of this theory applies directly to reengineering corporate processes; indeed, as a cross-fertilized theory from another field, it is more compelling and insight-provoking than a homegrown management theory would be. Dr. Hammer’s innate understanding of this probably led him to recognize the power of the early corporate change stories in the first place. But he never analogizes in this way, not in his books, his lectures, or his conversation.

Consider, for instance, his failure to talk about debugging. Anyone who studies programming knows that half the work of creating software is eliminating errors. Computer languages incorporate many ingenious tools and techniques for doing this. But while Dr. Hammer occasionally says reengineering plans should be iterative — that people in a company should revisit the plans in practice and eliminate problems — he proclaims far more loudly that “reengineering can’t be carried out in small and cautious steps. It is an all-or-nothing proposition.” Statements like this guarantee that neither time nor attention is made available for fixing errors. Indeed, there is enormous pressure at many sites to pretend

those errors don’t exist. No wonder that working in a reengineered company is often like living inside a piece of buggy, frustrating software, with no way to shut off the machine.

### Theory Counts

To be fair, Dr. Hammer is developing his own principles of process redesign. But they are drawn from the experience of companies he works with, and not from his computer science awareness, so they come out as simple platitudes. “A process should be performed by as few people as possible. Geography is a variable, not a given.” This benchmarking approach is probably the most telling factor underlying reengineering’s disappointments (past and future). As is the case with many management fashions, its advocates looked around for examples of corporate practice that seemed to work, and then summed up the “lessons learned,” with all the carelessness and arrogance that comes with intuitive philosophizing — instead of asking, in some robust theoretical way, why these principles would work and others would not.

In person, Dr. Hammer is an intelligent and gracious man, with a rare candor and a genuine interest in both learning from his mistakes and making a better world. Why, then, did he mask his intellectual origins? When I asked him recently, he said that, by temperament and training, he was inductive: Most mathematicians start with examples and build up their theories instead of starting with a body of theory to apply.

Reading Prof. Gelernter, one can imagine another reason Dr. Hammer downplayed his intellectual background in the service of promoting BPR: The macho culture of business can more easily accept a tough, no-

nonsense idea like “start from scratch” than a subtle set of concepts around the elegance of design.

I cannot prove, of course, that reengineering would have gone differently if there had been a design theory to invoke, and it’s certainly true that there are clumsy, inelegant, overstuffed programs around, despite 30 years of wisdom from the likes of Prof. Knuth. “I would have preferred a theory, too,” said Dr. Hammer. “But I felt it was too soon to try to develop one. There were hundreds of years of experimental data with the real world before Newton developed his theory; we have only a few decades of experience with process design.”

But theory-building, too, is an iterative process, and every field must start somewhere. And for reengineering, in the absence of a clear theoretical base, there was no compelling argument against the descent it made from process redesign to rampant downsizing. There was no effective way to argue that a default policy of cutting heads wouldn’t work; BPR’s creators could argue only that it was morally wrong. The reengineers have been struggling ever since to regain the control they lost over the movement they created. +