PART I

TRACING BUSINESS PROCESSES AND TRANSFORMATION
CHAPTER 2

WHATEVER HAPPENED TO BUSINESS PROCESS REENGINEERING?

The Rise, Fall, and Possible Revival of Business Process Reengineering from the Organizing Vision Perspective

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Abstract: The abundance of innovative concepts in the business world and their differentiated influence on business practices make one wonder what shapes these concepts. Taking the perspective that a concept evolves as an organizing vision for applying an innovation in firms, this chapter addresses one aspect of the evolution: how does the popularity of one concept influence that of the other? Studying the discourse on business process reengineering (BPR) in the past 15 years, I found that the popularity of BPR, at different points in time, was associated with the popularity of four other concepts: total quality management (TQM), enterprise resource planning (ERP), knowledge management, and e-business. The intrinsically related contents of these concepts not only explained their correlated popularity but also revealed a moving frontier of BPR. Historically, TQM served as a comparative vision for understanding BPR, and ERP offered a means to do reengineering. More recently, as traditional focal processes such as order fulfillment and software development have already been reengineered, knowledge management and e-business have helped shift the focus to knowledge-intensive and interorganizational processes. The chapter ends with a call for more research into the process by which innovative concepts emerge and business knowledge spreads.

Keywords: Discourse, Organizing Vision, Popularity, Total Quality Management, Enterprise Resource Planning, Knowledge Management, E-Business, Business Process Reengineering

INTRODUCTION

Today’s business world changes fast. So does the discourse—what is said and written—about business. Management scholars have recently shown increasing research interest in discourse (e.g., Boje et al., 2004; Wynn et al., 2002) not only because discourse reflects or embodies the dynamic business reality but also because discourse constructs the very reality (Phillips and Hardy, 2002). For instance, long aware that discourse matters, knowledge entrepreneurs such as consultants and industry pundits produce and disseminate discourse promoting an innovation (i.e., a new technique or technology) in order to prompt and extend the adoption of the innovation by firms or consumers (Abrahamson and Fairchild, 1999). In doing so, through their ongoing conversations and multiple readings of the innovation across time and place, these actors create and sustain a collective concept
(Tillquist, 2000) that describes, for example, what the innovation is, why firms should adopt it, and how to implement and benefit from it. It is through such a concept, termed an organizing vision by Swanson and Ramiller (1997), that discourse shapes the diffusion of innovations.

As a concept for applying an innovation in organizations, each organizing vision characterizes one type of innovation, such as quality circles, data warehouses, and customer relationship management (CRM). In the context of information technology (IT) innovations, a vision plays three functions in diffusing an innovation (Swanson and Ramiller, 1997). First, the vision addresses the uncertainties shrouding the innovation by providing an interpretation of the innovation. Second, the vision legitimizes the innovation by developing the underlying rationale for it. Third, the vision helps mobilize entrepreneurial and market forces that emerge to support the material production, adoption, and utilization of the innovation. To the extent that an organizing vision successfully serves these functions, the innovation may come to be widely adopted. Considering the influential role an organizing vision plays in an innovation’s diffusion, one may ask what shapes the vision itself. For instance, why do some visions become highly popular and generate voluminous discourse and others do not?

The scant empirical research on organizing visions has focused on the characteristics of particular visions. For example, Ramiller and Swanson (2003) related a vision’s interpretability, plausibility, importance, and discontinuity to the ascendant and descendant stages in the vision’s career. However, no vision arises in isolation. Little is known about the relationship among organizing visions. When two visions are related somehow, will one vision’s popularity influence that of the other? If so, how? In this chapter, by reviewing the evolution of the organizing vision for business process reengineering (BPR) for the past 15 years, I found that the popularity of the BPR vision, at various points in time, was associated with the popularity of four other visions related to BPR—total quality management (TQM), enterprise resource planning (ERP), knowledge management (KM), and e-business. As the chapter will show, the intrinsically related contents of these visions not only explained their correlated popularity but also revealed a moving frontier for BPR. The chapter will end with a call for more research into the process by which innovative concepts emerge and business knowledge spreads.

**MULTIDIMENSIONAL RELATIONSHIP AMONG ORGANIZING VISIONS**

How might the organizing visions of innovations be related? Most conspicuously, technological commonality among innovations affects the relationship between their visions. For example, both CRM and business intelligence utilize data mining technology. Thus, their visions are intrinsically related, and it is common to read about one with reference to the other. Innovations such as job enrichment and quality circles that do not share apparent technical components may still be related in discourse because they share people’s attention—focused mental engagement on particular ideas (Davenport and Beck, 2001).

Attention is multidimensional and so is the relationship among organizing visions. First, when an innovation is perceived to solve the same problem as are other innovations, its organizing vision may come to “overlap, blend, or clash with other organizing visions” in the same problem domain (Swanson and Ramiller, 1997, p. 469). For example, despite their differences, EDI (electronic data interchange) and XML (extensible markup language) have both been purported to transfer business transactional data across organizations. Hence, in discourse, the two innovations are often compared and their visions related. Similarly, in the domain of techniques for “managing employees,” the collapse of the job enrichment vision was suspected to have released much attention
needed for the rise of the quality circles (QC) vision (Abrahamson and Fairchild, 1999). Second, several innovations may require the attention from the same group of people in an organization. A case in point is that both computer-aided software engineering (CASE) and object-oriented programming (OOP) require the attention of software developers. Third, different innovations may address the same business process or function. For example, the adoption of an integrated CRM package may help the customer service departments meet the standardization requirement of the TQM programs in some organizations. Hence, it is not surprising to see the discourses for CRM and TQM intertwined, at least in those organizations. Although other dimensions than the three mentioned above (problem domain, group of people, and business process or function) may exist, this chapter does not aim to catalog all possible dimensions along which organizing visions may be related.

Current thinking suggests that, however related the visions are, their popularity is negatively correlated. That is, when vision A is related to vision B, one vision will become more popular and the other will become less so. The reason is that A and B share attention, the amount of which is finite and limited for a given problem domain (Swanson and Ramiller, 1997) or multidimensional “niche” (Whittaker and Levin, 1975). In other words, organizing visions are competing with each other for attention. When they encounter each other, more discourse is needed for “separating the visions, integrating them, or abandoning one in favor of another” (Swanson and Ramiller, 1997, p. 469). The validity of this argument depends on the assumption that visions A and B exclusively occupy the same multidimensional space (i.e., A and B perfectly overlap with each other in all dimensions, but neither overlaps with any other vision). In reality, perfect substitute visions may be hard to find. More common are visions that are related in some aspects and unrelated in others. In that situation, little is known about how the popularity of one vision influences that of another. This chapter examines how four visions related to BPR (TQM, ERP, KM, and e-business) influenced the popularity of BPR.

THE BPR VISION

In the early to mid-1980s, Michael Hammer, an MIT computer science professor-turned business consultant, became disenchanted with office automation (OA). He realized that using computers to automate outdated business activities would never address a company’s performance deficiencies. Declaring that “OA has no future” (Hammer, 1984), he began to search for a more compelling consulting practice. With the consulting firm Index Group, Hammer participated in a multifirm research program to understand new ways to improve work flows with IT. Based on the positive outcomes firms such as Ford, Hewlett-Packard, IBM Credit, and Mutual Benefit Life had obtained from their work flow redesign projects, Hammer coined the term business process reengineering in 1987, aiming to shift managers’ attention from improving individual functions incrementally to redesigning value-creating business processes. Index immediately selected BPR to label this new practice over “business process transformation,” which sounded too “touchy-feely” (Kleiner, 2000, p. 29). Meanwhile, Thomas Davenport, Hammer’s collaborator at Index, proposed an article on BPR to the Harvard Business Review, which, however, rejected his proposal. At this stage it was uncertain whether BPR would become the “next big thing.”

The Rise

The economic recession in the early 1990s gave the nascent BPR vision a boost. In July 1990, readers of the Harvard Business Review, many of whom were struggling with sagging corporate
performances, saw an article entitled “Reengineering Work: Don’t Automate, Obliterate,” in which Hammer urged managers to strive for a “dramatic level of improvement” and to “use information technology not to automate an existing process but to enable a new one” (Hammer, 1990, p. 108). At about the same time, Davenport and James Short published an article in the Sloan Management Review that provided detailed guidance for redesigning business processes with IT (Davenport and Short, 1990). The initial vision for BPR, introduced in these two prominent management journals, was quickly picked up first by IT-related periodicals and then by outlets with broader audiences. In 1993, Davenport’s book, Process Innovation: Reengineering Work Through Information Technology, was published. Almost concurrently, Hammer and James Champy released Reengineering the Corporation: A Manifesto for Business Revolution. In this best-selling book, the authors define 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” (Hammer and Champy, 1993, p. 33). With this definition, Hammer and Champy stressed a number of principles for BPR. First, by “fundamental rethinking,” they encouraged discontinuous thinking, that is, identifying and abandoning old rules and assumptions underlying existing business processes. Second, by “radical redesign,” they asked managers to discard existing structures and procedures and design new processes with “a clean sheet of paper” (Hammer and Champy, 1993, p. 49). Third, by “dramatic improvement,” they differentiated BPR from marginal or incremental improvements, which often characterized the objectives of TQM programs. Fourth, by “business processes,” they accentuated the “process orientation” where tasks performed by specialists should be brought back together into business processes that deliver value to the customer. Last, they acknowledged the enabling role of IT for BPR.

From these pioneering articles and books, the BPR discourse grew exponentially in the form of more articles, books, conferences, and workshops. Figure 2.1 shows that the number of articles about BPR in ABI/Inform Global, a database of nearly 1,800 worldwide business periodicals, took a dramatic leap in 1993 and 1994, reaching the peak in 1995, when the BPR vision turned into a $51 billion consulting industry. In 1993, the management consulting firm Bain and Company began surveying firms worldwide regarding their use of various management tools. Figure 2.1 also shows that 66 percent of the respondents taking Bain’s survey said that they were using some form of reengineering in 1993. Like the discourse, the usage reached its full ascendancy (78 percent) in 1995. Another survey conducted by CSC Index in 1994 found that firms most frequently reengineered their customer service, order fulfillment, and manufacturing processes. Despite these impressive figures, BPR’s popularity did not last long.

The Fall

In a November 1995 Fast Company article, describing the fall of those corporate exemplars of BPR, Davenport wrote “reengineering isn’t dead; it is effectively over” (Davenport, 1995, p. 70). Bain’s annual management tools survey (see Figure 2.1) saw the usage of BPR drop for the first time in 1996, and it continued to drop for the next five years. With regard to the benefits of financial results, market share, growth, and competitive stance, the survey showed that BPR’s scores were below average, whereas BPR had topped the same benefit categories just two years before. This change mirrored BPR’s rapidly waning popularity in the corporate world. “A series of studies in the early 1990s established that 70 percent or more of reengineering initiatives had actually made things worse” (Kleiner, 2000, p. 28). Amid the “confusion, delays, resentment, and screwups” (Kleiner, 2000, p. 28), middle managers led a fierce backlash against BPR, because they were then vulnerable to the downsizing attributed to reengineering. Unwilling to take all of the blame
heaped on BPR, reengineering gurus apologized for forgetting about people. “I wasn’t smart enough about that,” Hammer told the Wall Street Journal in November 1996. “I was reflecting my engineering background and was insufficiently appreciative of the human dimension. I’ve learned that’s critical” (White, 1996, p. A1). Similarly, Davenport wrote: “The rock that reengineering has foundered on is simple: people. Reengineering treated the people inside companies as if they were just so many bits and bytes, interchangeable parts to be reengineered. But no one wants to ‘be reengineered’” (1995, p. 70). The term reengineering suddenly became an expletive in addition to a fad. Major consulting firms that had made fortunes from reengineering practices dropped the BPR label. Some found new labels (“organizational agility” at CSC Index); others (e.g., Ernst & Young and Andersen Consulting) terminated their reengineering practice and embarked on KM and ERP implementations. Accordingly, as shown in Figure 2.1, BPR discourse declined in the late 1990s nearly as quickly as it had risen.

Signs of Revival?

BPR did not go away with the old millennium, however. Both BPR usage reported by Bain’s annual management tools survey and BPR discourse volume measured by the number of articles in ABI/Inform rose again in 2000 and 2001 (see Figure 2.1). In March 2000 when the Internet bubble burst, CIO Magazine published a special report, entitled “Reengineering Redux,” including a roundtable discussion by Hammer and “a stellar panel of CIOs and business executives.” The introduction of the report claimed, “[n]ow the headlong rush to e-business is bringing us
back to the reengineering bowl for another dip” (2000, p. 143). A month later, Hammer’s former collaborator Champy ended his search for “a better label.” In a Computerworld column, also entitled “Reengineering Redux,” Champy wrote that “so-called business-to-business digital marketplaces will succeed only if they offer re-engineered processes to sellers and buyers. . . . The New Economy won’t work without re-engineering” (2000, p. 47). By 2002, Bain’s survey of 708 global executives found that 54 percent of their firms had reengineering initiatives, suggesting a likely revival for BPR.

As this short history suggests, the rise, fall, and possible revival of BPR overlapped with the rise and fall of several other visions. I have chosen to look at four of them in more detail. First, TQM is “a set of systematic activities carried out by the entire organization to effectively and efficiently achieve company objectives so as to provide products and services with a level of quality that satisfies customers, at the appropriate time and price.” Second, ERP represents a class of IT that integrates an organization’s diverse business functions into one system. Third, KM, however diversely defined, represents organizational endeavors to stimulate learning and to benefit from knowledge. Last, e-business enables suppliers, distributors, and customers to conduct business electronically. Figure 2.2 portrays the popularity of these four visions and BPR in ABI/Inform. The next section describes how I analyzed the relationships among the visions.

DATA AND THEIR ANALYSIS

The primary data source for this chapter is archived written discourse—articles published in periodicals indexed by ABI/Inform. Discourse researchers count the number of articles on particular
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Like-wise, I measured the popularity of the BPR vision by counting the number of articles whose titles, abstracts, or subjects included the phrase *business process reengineering* for each periodical for each quarter from 1990, when the first article about BPR appeared in ABI, to the last quarter of 2004. Among the 5,511 articles identified, ABI did not record the quarters in which 671 articles were published, and thus I dropped those articles and focused on the remaining 4,840 articles, published by 647 periodicals. The articles were unevenly distributed across those periodicals. Table 2.1 shows the top 20 periodicals that published nearly 30 percent of the BPR articles. Interestingly, the three major IT periodicals—Computerworld, InformationWeek, and CIO Magazine—are the top three publishers of articles on BPR, suggesting a strong IT flavor in the BPR discourse. In contrast, 535 periodicals published fewer than 10 articles in the 15 years. The 122 periodicals that each published 10 or more BPR articles were retained for further analysis. Observations for each periodical began with the first quarter when the article count was not zero and ended in the last quarter of 2004.

For the volume of discourses carrying other visions related to BPR (i.e., TQM, ERP, KM, and e-business), I counted articles on each vision in the entire ABI/Inform Global database for each quarter in the same period, with the caveat that these four visions are illustrative rather than comprehensive. I also assumed that each periodical’s decisions about whether and how much to publish about BPR in each quarter was shaped by the total volume of discourses about related visions, not by the volume published by any particular periodical.

Table 2.2 lists operational definitions of all variables. The dependent variable (Variable 1) is the BPR article count $y_{jq}$ for each periodical $j$ each quarter $q$. To partial out the effect of periodical-specific factors on the outcome, I included four control variables (Variables 2–5, denoted as $x_{kjq}$ for the $k$th variable for each periodical $j$ each quarter $q$): each periodical’s age, authorship, and

| Table 2.1
<p>| Top 20 Periodicals that Published Articles on BPR |</p>
<table>
<thead>
<tr>
<th>Periodical</th>
<th>BPR Article Count</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Computerworld</td>
</tr>
<tr>
<td>2</td>
<td>InformationWeek</td>
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<tr>
<td>3</td>
<td>CIO</td>
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<tr>
<td>4</td>
<td>Industry Week</td>
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<tr>
<td>5</td>
<td>Industrial Engineer</td>
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<tr>
<td>6</td>
<td>Computing Canada</td>
</tr>
<tr>
<td>7</td>
<td>Quality Progress</td>
</tr>
<tr>
<td>8</td>
<td>Chemical Week</td>
</tr>
<tr>
<td>9</td>
<td>CRN</td>
</tr>
<tr>
<td>10</td>
<td>InfoWorld</td>
</tr>
<tr>
<td>11</td>
<td>Manufacturing Systems–MSI</td>
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<tr>
<td>12</td>
<td>Strategic Finance</td>
</tr>
<tr>
<td>13</td>
<td>National Underwriter</td>
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<td>14</td>
<td>Government Executive</td>
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<td>15</td>
<td>Progressive Grocer</td>
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<tr>
<td>16</td>
<td>Executive Excellence</td>
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<tr>
<td>17</td>
<td>Datamation</td>
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<tr>
<td>18</td>
<td>Journal of Organizational Excellence</td>
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<tr>
<td>19</td>
<td>Management Services</td>
</tr>
<tr>
<td>20</td>
<td>Best's Review</td>
</tr>
</tbody>
</table>
Table 2.2

Summary Statistics and Bivariate Correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Quarterly number of articles on BPR per periodical</td>
<td>0.63</td>
<td>1.45</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2 Age of periodical in years</td>
<td>43.05</td>
<td>30.23</td>
<td></td>
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</tr>
<tr>
<td>3 Academic periodical (0,1)</td>
<td>0.25</td>
<td>0.44</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>4 Frequency of publication per year</td>
<td>16.64</td>
<td>15.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 U.S.-based periodical (0,1)</td>
<td>0.76</td>
<td>0.42</td>
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<td>6 Quarter</td>
<td></td>
<td></td>
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<tr>
<td>7 Quarterly percentage change of S&amp;P 500 index</td>
<td>2.30</td>
<td>6.84</td>
<td></td>
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<tr>
<td>8 Quarterly number of articles on TQM in ABI</td>
<td>277.14</td>
<td>148.68</td>
<td></td>
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</tr>
<tr>
<td>9 Quarterly number of articles on ERP in ABI</td>
<td>102.39</td>
<td>87.71</td>
<td></td>
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<tr>
<td>10 Quarterly number of articles on knowledge management in ABI</td>
<td>167.81</td>
<td>140.97</td>
<td></td>
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<tr>
<td>11 Quarterly number of articles on e-business in ABI</td>
<td>772.55</td>
<td>684.84</td>
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</tbody>
</table>

Variable 5 6 7 8 9 10
6 Quarter | | | | | | |
7 Quarterly change of S&P 500 index | | | | | | |
8 Quarterly number of articles on TQM in ABI | | | | | | |
9 Quarterly number of articles on ERP in ABI | | | | | | |
10 Quarterly number of articles on knowledge management in ABI | | | | | | |
11 Quarterly number of articles on e-business in ABI | | | | | | |

Notes: N = 5,389. * p < 0.05; ** p < 0.01; *** p < 0.001.
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Readership (academic or nonacademic), publication frequency, and headquarters location (U.S.-or non-U.S.-based). These data came from Ulrich’s Periodicals Directory reported annually by R.R. Bowker. To exclude the potential influence of time, a linear time trend (Variable 6, updated each quarter) was included as a control variable. Moreover, Cyert and March (1992) argued that “performance gaps” between aspirations and achievement motivate managers to increase their search for innovations that may help narrow the gaps. At an aggregate level, firm performance thus may drive the volume of discussions about certain innovations. To account for that possibility, I included another control variable (Variable 7)—the quarterly change of the Standard & Poor’s 500 index—as a proxy for aggregate performance. Variables 8–11 in Table 2.2 are the independent variables. Each independent variable $x_{kjq}$ measures the $k$th factor for each periodical $j$ each quarter $q$. In order to make inference about causality, the dependent variable (BPR article count) was lagged one quarter behind all independent and control variables.

Because the dependent variable is the quarterly BPR article count, count data regression was used. In particular, I used negative binomial regression, a general form of count data regression, in order to test the statistical significance of the covariates’ influence. Essentially, the expected number of articles on BPR published by each periodical each quarter can be modeled as a function of the popularity of related visions and control factors:

$$\mu_{jq} = \exp[\beta_0 + \beta_1 x_{1jq(q-1)} + \beta_2 x_{2jq(q-1)} + ... + \beta_m x_{mj(q-1)}],$$

where $\mu_{jq}$ is the expected value of $y_{jq}$ (i.e., $\mu_{jq} = E[y_{jq} | x_{1jq(q-1)}, x_{2jq(q-1)}, ..., x_{mj(q-1)}]$) and $\beta$s are parameters to be estimated. To estimate coefficients in the model, I used Stata® because of its straightforward procedure for negative binomial regression.

RESULTS

Between July 1990 and December 2004, the 122 periodicals published 3,401 articles on BPR in ABI/Inform. Table 2.2 displays the summary statistics for the 11 variables and their pairwise correlations. On average, each periodical published 0.63 articles on BPR each quarter. The average age for the periodicals was 43.05 years. A quarter of the periodicals were academic journals; three-quarters were based in the United States. Ranging from weekly to quarterly, the periodicals published 16.64 times a year. In the same period, about 773 articles on e-business were published in each quarter on average, making e-business the vision with the largest discourse among the four. All correlations between the dependent variable and other variables are significant. The correlations between several pairs of independent and control variables are relatively high but give no indication of serious multicollinearity problems.

Reflecting the distinctly larger volume of the e-business discourse, a different axis was used in Figure 2.2. The figure indicates that, despite the different life cycles of the five visions, some phases of their life cycles may have been correlated at different times. For example, in the early 1990s, the upswing phase of the BPR discourse largely paralleled with the rise of the TQM discourse with some delay. The downswing phase of the BPR vision in the second half of the 1990s concurred with the rise of discourses on ERP, e-business, and KM.

Table 2.3 presents the results from negative binomial regression analysis. Model 1 is a full model including all 10 covariates. The interaction terms between independent variables and time (measured in quarters) were then added (Model 2). Both models utilized the entire data set of the 15-year data. All the interaction terms are significant (Model 2), meaning the strength of associations depended on time. Therefore, I broke the 15-year period into three five-year subperiods.
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<tbody>
<tr>
<td>Control Variable</td>
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</tr>
<tr>
<td>Age</td>
<td>–0.01* (0.00)</td>
<td>–0.01* (0.00)</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
<td>–0.02*** (0.00)</td>
</tr>
<tr>
<td>Academic</td>
<td>–0.12 (0.13)</td>
<td>–0.11 (0.13)</td>
<td>–0.50** (0.19)</td>
<td>–0.13 (0.12)</td>
<td>0.28 (0.21)</td>
</tr>
<tr>
<td>Frequency</td>
<td>0.02** (0.01)</td>
<td>0.02** (0.01)</td>
<td>0.02* (0.01)</td>
<td>0.01* (0.01)</td>
<td>0.02** (0.01)</td>
</tr>
<tr>
<td>US</td>
<td>0.05 (0.13)</td>
<td>0.06 (0.13)</td>
<td>0.14 (0.19)</td>
<td>0.10 (0.13)</td>
<td>0.04 (0.20)</td>
</tr>
<tr>
<td>Quarter</td>
<td>–0.03** (0.01)</td>
<td>–0.03** (0.01)</td>
<td>0.15** (0.06)</td>
<td>–0.12** (0.04)</td>
<td>0.02 (0.06)</td>
</tr>
<tr>
<td>S&amp;P 500 Change</td>
<td>0.02*** (0.00)</td>
<td>0.02*** (0.00)</td>
<td>0.05* (0.02)</td>
<td>0.03** (0.01)</td>
<td>0.04** (0.01)</td>
</tr>
<tr>
<td>Independent Variable</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TQM</td>
<td>0.66** (0.23)</td>
<td>0.34** (0.11)</td>
<td>2.00** (0.70)</td>
<td>0.39 (0.50)</td>
<td>0.95 (0.80)</td>
</tr>
<tr>
<td>TQM · Quarter</td>
<td>–0.02** (0.01)</td>
<td>–0.02** (0.01)</td>
<td>–0.05* (0.02)</td>
<td>0.04** (0.01)</td>
<td>0.21 (0.51)</td>
</tr>
<tr>
<td>ERP</td>
<td>–0.09 (0.07)</td>
<td>–0.08 (0.06)</td>
<td>0.01*** (0.00)</td>
<td>0.07 (0.04)</td>
<td>0.06 (0.06)</td>
</tr>
<tr>
<td>ERP · Quarter</td>
<td>–0.09 (0.07)</td>
<td>–0.08 (0.06)</td>
<td>0.01*** (0.00)</td>
<td>0.07 (0.04)</td>
<td>0.06 (0.06)</td>
</tr>
<tr>
<td>KM</td>
<td>0.02 (0.02)</td>
<td>0.01 (0.00)</td>
<td>0.07 (0.04)</td>
<td>0.06 (0.06)</td>
<td>1.45* (0.68)</td>
</tr>
<tr>
<td>KM · Quarter</td>
<td>0.02 (0.02)</td>
<td>0.01 (0.00)</td>
<td>0.07 (0.04)</td>
<td>0.06 (0.06)</td>
<td>1.45* (0.68)</td>
</tr>
<tr>
<td>E-business</td>
<td>0.02 (0.02)</td>
<td>0.01 (0.00)</td>
<td>0.16 (0.12)</td>
<td>0.02 (0.06)</td>
<td>2.85** (0.89)</td>
</tr>
<tr>
<td>E-business · Quarter</td>
<td>0.02 (0.02)</td>
<td>0.01 (0.00)</td>
<td>0.16 (0.12)</td>
<td>0.02 (0.06)</td>
<td>2.85** (0.89)</td>
</tr>
</tbody>
</table>

N = 5,389 5,389 593 2,390 2,406
Wald χ² (degrees of freedom) = 422.84 (10) 416.57 (14) 38.17 (10) 175.18 (10) 36.22 (10)
Probability > χ² = 0.000 0.000 0.000 0.000 0.000

* p < 0.05; ** p < 0.01; *** p < 0.001.
WHATEVER HAPPENED TO BPR?

(1990–94, 1995–99, and 2000–4) that represented the rise, fall, and likely revival of BPR, respectively. Accordingly, I performed the same regression analysis on data for each five-year subperiod in Models 3, 4, and 5. Analogous to the $F$-test in ordinary least squares (OLS) linear regression, the Wald chi-square tests show that all models are significant improvements from the unrestricted models of simple means.

Among the six control variables, publication frequency was significantly positively associated with the BPR article count in all models. Similarly, the effect of S&P 500 index change was significant and positive in all models, confirming the “performance gap” theory. Being headquartered in the United States did not matter at all to how many BPR articles each periodical published. Interestingly, the academic or scholarly nature of a periodical had a significant negative effect on the number of BPR articles the periodical published between 1990 and 1994, indicating that academic periodicals published fewer articles about BPR than their practitioner counterparts did in each quarter in those years, ceteris paribus. However, the academic effect disappeared after 1995.

Among the independent variables, only the TQM article count had a significant (positive) effect on the dependent variable over the 15 years (Model 1). However, the significant and negative coefficient for the interaction between TQM and time in Model 2 suggests that TQM’s positive effect significantly decreased over time, as confirmed by the nonsignificant effect of TQM after 1995 in Models 4 and 5. Although article counts on the other visions (ERP, KM, and e-business) had no effects on the dependent variable (Model 1), their interactions with time were all significant and positive. Model 3 suggests that ERP and BPR went in opposite directions in terms of article count before 1995. However, that relationship was reversed in the next five years (Model 4). The effects of KM and e-business discourses on the dependent variable were similar. They were not significant in the first 10 years, but were significant and positive in the new millennium.

In sum, the regression results suggest that the effects of related visions on the BPR vision were different at different times. Between 1990 and 1994, the rise of BPR discourse was positively associated with the rise of TQM discourse, but negatively associated with ERP discourse. The fall of BPR discourse in the second half of the 1990s was positively associated with ERP discourse. After 2000, BPR’s seeming resurgence was associated positively with discourses on e-business and KM.

DISCUSSION

The above discourse analysis has established that the popularity of BPR and that of the other four visions was linked at various times. The linkage, as I discuss below, can be interpreted by the intrinsic relationship among these visions in terms of their substance.

Total Quality Management

The U.S. Naval Air Systems Command coined the term total quality management to describe its Japanese-style management approach to quality improvement in the early 1980s. However, the quality movement was initiated as early as the 1940s. BPR inherited a number of principles from TQM. First, rejecting the traditional formulation of quality control that only examined the characteristics of the end products, TQM incorporates quality diagnosis and correction in the entire production process that often cuts across a number of functions. BPR applies this process orientation to redesigning not only production processes but also other processes such as order fulfillment and customer services. Second, like TQM, BPR espouses the customer-centric view. Just as “quality is what customers say it is,” business processes must deliver what customers value.
Third, both TQM and BPR emphasize measuring results, and, thus, the rigorous techniques for quality measurement have been employed to evaluate BPR outcomes in terms of quality as well as cost, profit, and speed.

Besides inheriting the TQM legacies mentioned above, BPR contrasts strikingly with TQM in other aspects. Foremost, TQM programs seek to improve existing processes, and contemporary quality management emphasizes continuous improvements that are often incremental. BPR, as formulated by Hammer and Champy, seeks radical improvements and “breakthroughs, not by enhancing existing processes, but by discarding them and replacing them with entirely new ones” (1993, p. 49). Such radicalness makes TQM’s bottom-up, employee-empowerment approach inapplicable to BPR programs, which often follow a top-down route. This dissimilarity has been attributed to cultural differences. Hammer and Champy wrote, “Reengineering isn’t another idea imported from Japan. . . . Reengineering capitalizes on the same characteristics that have traditionally made Americans such great business innovators: individualism, self-reliance, a willingness to accept risk, and a propensity for change” (1993, pp. 2–3).

Both the similarities and differences between TQM and BPR, I suspect, explain the positive correlation between their discourses, especially in the early 1990s. Later on, TQM gradually lost its popularity and was increasingly called quality management in the United States. Today, TQM has arguably been folded into standardization initiatives such as Six Sigma and ISO 9000. The nonsignificant coefficients for TQM in Models 4 and 5 indicate that the BPR discourse has parted with that of TQM.

**Enterprise Resource Planning**

In April 1990, IT research firm Gartner Group introduced ERP as the next generation of MRP II (manufacturing resource planning). The heart of an ERP system is a central database that collects data from and feeds data into the system’s individual application components (called modules), supporting diverse business functions and processes such as finance, manufacturing, logistics, human resources, and so on. When new information is entered or updated in one module, other related modules in the system are automatically updated.

Apparent in the ERP vision is the cross-functional process orientation, consistent with the BPR vision. Radically new business processes coming out of the redesign sessions need redesigned and reimplemented information systems. However, most manufacturing firms did not have the capabilities to develop new IT anymore, partly because they had downsized their software development workforce, which had not been considered a “core competency.” The call of new business processes for new enabling IT made many firms shift from building to buying IT, especially packaged business software, throughout the 1990s (Swanson, 2003). In 1992, market leader SAP introduced a client/server–based ERP suite that quickly conquered the European and the U.S. markets. Major ERP vendors (SAP, Oracle, PeopleSoft, Baan, and J.D. Edwards) enjoyed dramatic growth in the mid-to-late 1990s. By the end of 1998, more than 60 percent of the Fortune 1000 companies had implemented ERP core applications (Stein, 1999). With expanding functionalities and new interfaces added, ERP packages quickly spread from large companies to mid-sized companies, from European and U.S. markets to Asia Pacific and Latin America, from manufacturing and logistics companies to other vertical industries such as wholesale, health care, banking, and insurance.

However, a tension existed between the business processes packaged in the ERP systems and those written on that “clean sheet of paper” in the BPR programs. ERP packages were notoriously difficult to customize to match the processes either previously existing in the firms or desired by reengineering managers. Therefore, when ERP systems were introduced to companies, manag-
ers found that their first priority was to change their existing business processes to fit with the “best practices” prepackaged in the ERP systems. Possibly, they shifted their attention originally allocated to BPR to the business process change posed by ERP, leading to a significant negative correlation between the discourses on ERP and BPR (Model 3). Nonetheless, the “best practices” embedded in ERP were newer and significantly different from the existing processes in many firms. Gradually, ERP became a means to do BPR, as more and more firms adopted ERP systems with specific embedded processes that they would like to obtain (Davenport, 2000). In this way, the relationship between ERP and BPR became increasingly complementary—a proposition confirmed by both the positive coefficient for the interaction between ERP and time in Model 2 and the positive coefficient for ERP in Model 4, suggesting that the ERP and BPR visions became supportive of each other in the late 1990s.

Knowledge Management

The concept of KM emerged in the 1980s and remained largely unknown until the late 1990s, when KM became popular in discourse (Figure 2.2) and practice. In 2001, market research firm IDC reported that worldwide spending on KM services was $3.7 billion. Most of the money was paid for KM consulting, succeeding BPR as a new “advisory practice” in major consultancies. The succession struck Brown and Duguid as particularly interesting as they observed: “As reengineering stumbled, reengineering consultants themselves began to be downsized. They probably needed little sympathy, for many moved swiftly across the hall to the suites reserved for the next fashion, ‘knowledge management’” (2000, p. 93). KM and BPR are related not only because they both were likely advised by the same consultants but also because KM has extended the BPR vision.

Despite the numerous definitions for KM and the still heated debate on whether knowledge can actually be “managed,” it is generally accepted that KM has at least two broad “tracks”—information management and practice management (Prusak, 2001; Sveiby, 1999). Both are subtly related to BPR. On one hand, information management focuses on how information is created, processed, stored, retrieved, and used with the help of IT. In the business context, information flows in every process, and managing information is thus an essential part of managing business processes. As mentioned earlier, BPR programs were initially concentrated on processes in customer services, order fulfillment, and manufacturing, where processes can be relatively clearly defined, outcomes accurately measured, and thus information management relatively straightforward. As BPR has advanced into more “knowledge-intensive” processes such as sales, marketing, research and development, and management, where knowledge workers are autonomous, knowledge work invisible, and work flow nonlinear, reengineering these processes thus requires a more sophisticated form of information management, or KM. For example, when it comes to reengineering photocopier repair processes, a product manual, however improved, that ignores the unique context in which each copier works may not be so helpful to service technicians as is a “knowledge base” composed of tips extracted from “war stories” told by technicians (Bobrow and Whalen, 2002).

On the other hand, reengineering knowledge-intensive processes also requires practice management, the other track of KM. Practice, the way in which work gets done (Brown and Duguid, 2001), is often different from the process described formally in manuals, training programs, organizational charts, and job descriptions (Brown and Duguid, 1991). Some scholars attribute this difference to different levels of abstraction, whereas others maintain that practices are always situated in particular contexts and thus should not be codified into processes and applied to other contexts (Brown and Duguid, 2000). According to the latter, the sensible way to “manage” practice is to facilitate or support people in getting their work done. A notable example of such
practice management is to foster access to and membership of “communities of practice” (Brown and Duguid, 1991; Lave and Wenger, 1991). Therefore, reengineering processes entails careful attention to the practices that make the processes. Together, information management and practice management made KM a driver for BPR, as the significant association between the BPR and KM discourses in 2000–4 corroborated (Model 5 in Table 2.3).

E-Business

The commercialization of the Internet technology and spread of the World Wide Web in the 1990s made it possible for firms to engage in e-business. The implications of e-business for business processes became clear and important. Fahey et al. wrote:

[E-business] provides the electronic means to enable connections among and between processes to take place in fundamentally new ways and at such speeds that it literally opens up the ability to radically reconfigure each core operating process, to create new subprocesses within each core operation process, and to enable new modes of integration across the operating processes. (2001, p. 895)

The core processes, as Fahey et al. argued, include processes that directly buttress and enable developing, producing, and delivering products and services valuable to the customers (e.g., product development, customer services, and supply-chain management). Many of the processes in the traditional “brick-and-mortar” firms were inadequate to the demands of e-business (Kleiner, 2000). The fall of the first crop of “dot-com” ventures suggested that a slick Web storefront without seamless and efficient business processes would not work. Ventures that had reengineered their internal processes (whether by implementing ERP or not) in the 1990s found themselves facing another round of process reengineering in the new millennium. This time, the focus was on the interenterprise processes linking suppliers, producers, distributors, and customers in an “e-business value web.” Linkages that did not exist had to be built. Disparate processes needed to be standardized. Rigid processes, typically packaged in ERP systems, were to be relaxed. In this sense, e-business might have created new hope for BPR’s possible revival, a conjecture supported by the finding that the volume of e-business discourse had significant correlation with that of the BPR discourse in 2000–4 (Model 5 in Table 2.3).

To summarize, Table 2.4 encapsulates my interpretation of the relationships between BPR and the four other visions around the three questions the BPR vision is supposed to answer: What is BPR? Why do it? And how to do it? For instance, discourse that compared BPR with TQM helped clarify the similarities and differences between the two visions, making it relatively easy to interpret what is BPR. Further, regarding why firms should do BPR, newer visions such as KM and e-business provided new rationales and motivations much needed for BPR’s possible revival. Moreover, the techniques, methods, and technologies underlying other visions equipped reengineers with the necessary know-how to carry out the BPR vision in practice.

CONCLUSION

The 15-year evolution of BPR indicated that the popularity of the four organizing visions (TQM, ERP, KM, and e-business) I chose to study were positively associated, with the exception of ERP in 1990–94, with the popularity of BPR at different times. The association, as interpreted above, was rooted in the inherently related substance of the visions. Historically, TQM served as a compara-
### Interpretation of the Relationships Between BPR and Other Visions

<table>
<thead>
<tr>
<th></th>
<th>What Is BPR?</th>
<th>Why Do BPR?</th>
<th>How To Do BPR?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Quality Management</td>
<td>+ The similar principles (e.g., process orientation, customer-centric view, and emphasis on measurement) and the different principles (e.g., incremental versus radical improvements, bottom-up versus top-down, Japanese versus American) help compare the TQM and BPR visions clearly.</td>
<td>+ TQM and BPR share the objective to improve quality in the production process.</td>
<td>+ Rigorous quality control and evaluation methods can be applied to assessing the outcomes from reengineering programs.</td>
</tr>
<tr>
<td>Enterprise Resource Planning</td>
<td></td>
<td></td>
<td>– Tension exists between the processes designed or redesigned in BPR programs and processes prepackaged in ERP systems. + ERP systems enable cross-functional business processes. Implementing ERP systems is therefore an opportunity to integrate previously siloed business activities and functions into reengineered processes.</td>
</tr>
<tr>
<td>Knowledge Management</td>
<td></td>
<td>+ KM and BPR share the objective to improve knowledge-intensive processes such as product development (R&amp;D), marketing, and management.</td>
<td>+ KM methods such as information management and practice management are useful in reengineering knowledge-intensive processes.</td>
</tr>
<tr>
<td>E-business</td>
<td></td>
<td>+ For firms to conduct business electronically with suppliers, partners, and customers, internal and interenterprise business processes must be created and redesigned to meet the new requirements.</td>
<td>+ A variety of e-business technologies (e.g., XML and Web services) enable the reengineered e-business processes.</td>
</tr>
</tbody>
</table>

*Notes:* + is positive implication on the relationship between the vision and the BPR vision; – is negative implication on the relationship between the vision and the BPR vision.
tive vision for understanding BPR, and ERP offered a means to do reengineering. More recently, as traditional focal processes such as order fulfillment and software development have already been reengineered, KM and e-business have helped shift the focus to knowledge-intensive and interorganizational processes. The trend is clear: as some business processes are reengineered, commoditized, standardized, and outsourced (Davenport, 2005), other processes will become the new, interesting frontier of reengineering, and transforming those processes early on will bring competitive advantage before the even newer frontier emerges.

Essentially, this chapter addresses a knowledge-intensive, interorganizational process not yet well understood—namely, the process of creating and popularizing grand concepts (or organizing visions) for business innovations. It is knowledge intensive because each organizing vision contains knowledge about the innovation's purpose, function, and outcome. The process is also interorganizational because various organizations contribute and synthesize knowledge in discourse that goes beyond organizational boundaries. As a case study of BPR, this chapter shows that the extent to which BPR was popular depended on the popularity of other related visions at different times. At this point, we do not know, for example, how much of the relationship among visions and timing is subject to human agency and how the visions are related in a dynamic, multidimensional network. Apparently, we have just begun this line of inquiry into the process by which innovative concepts are created and business knowledge diffuses. An understanding of the process can help us improve, or perhaps even reengineer, it.

ACKNOWLEDGMENTS

The author is grateful to the editors of this volume and Burt Swanson for their helpful comments. The study was supported, in part, by the Information Systems Research Program at UCLA Anderson School of Management.

NOTES

1. All articles were counted if their titles, abstracts, or subjects include the phrase business process reengineering.
4. JUSE (Union of Japanese Scientists and Engineers), a spearhead organization for quality management, provided this definition.
5. The most commonly used count models are Poisson and negative binomial. Poisson is the special case of negative binomial when the conditional variance equals the conditional mean. In this study, the variance of the dependent variable far exceeds its mean (i.e., the data are overdispersed), as shown in Table 2.2, so negative binomial is more appropriate than Poisson. For technical details, see Cameron and Trivedi (1998).
6. The BPR article counts are assumed independent across periodicals, but not necessarily for each periodical. Therefore, I used the cluster option of Stata’s nbreg procedure (Stata Corporation, 2001) to correct the estimated standard errors, accounting for the lack of independence across observations for each periodical.
7. In Model 2, the counts on the related visions were logarithm transformed and then centered around the means.

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