

**COMPETING IN THE INFORMATION AGE:
STRATEGIC ALIGNMENT IN PRACTICE**

Edited by Jerry N. Luftman.¹

New York, N.Y.: Oxford University Press, Inc. 1996.

Pp. 414. \$35.00 (hard).

Perhaps more than anything else, information technology ("IT") is a subject area that has become a major source of anxiety for business leaders of the 1990s. IT can indisputably have a tremendous impact on a company — from improved inventory management, to better tracking of customer preferences, to faster product development. However, before a company may realize these benefits, its executives must overcome a number of obstacles. First, they must bridge the gap between the company's "technical" and "business" people. The technical jargon used to describe IT projects is as incomprehensible to executives (pp. 138-40) as the consultant jargon executives use is to information engineers. Second, executives, who are often unaware of the capabilities of the latest generation of IT products and services, must educate themselves about how these capabilities might fit into the existing business (p. 21). Finally, they must deal with the uniquely complex nature of IT investment decisions. It is often difficult to quantify the extent to which investments in IT will enhance the profitability of an operation (p. 164). Furthermore, it is not easy to predict how quickly the assets purchased in an IT initiative will become obsolete.

Competing in the Information Age proposes to help the perplexed executive find her way through these complexities. Edited by Jerry Luftman, it is a compilation of articles² by academics and consultants on various aspects of developing and implementing an IT strategy. The cover jacket explains that the book "outlines how to match information systems with business strategy to forge a strong competitive edge and bring powerful solutions to real-world problems." Weighing in at 414 pages and apparently dedicated to tackling the thorny issues behind the development of an IT strategy, a reader might expect a thorough handling of these problems. Such a reader will be disappointed. Although

1. Jerry Luftman is the Executive Director of the Stevens Institute of Technology's information management research center. Contributors to *Competing in the Information Age* include a number of leading academics in the field, including Peter Keen, B. Joseph Pine, and N. Venkatraman.

2. Each article constitutes a different chapter in the book. For the sake of variety, "chapter" and "article" will be used interchangeably in this review.

Competing in the Information Age is a reasonable overview of IT strategy formulation, it gives only ambiguous and slippery answers to the toughest questions.

Luftman's book is based on the Strategic Alignment Model, which is presented in Chapters 2 and 3. These chapters explain the basics and the remainder of the book covers aspects of the model in greater detail. As the model's title suggests, the focus is on how to develop a synchronous set of strategies and policies within a company. The authors identify four elements that must be brought into alignment with one another: Business Strategy, IT Strategy, Organizational Infrastructure, and Information Systems ("IS") Infrastructure (pp. 25-28).³ These elements and their interrelationships are displayed in the two-by-two matrix in Figure 1.

The Strategic Alignment Model's basic premise is that traditional analysis has tended to concentrate on either the vertical alignment within the matrix (the extent to which infrastructure and processes support a company's strategy) or the horizontal alignment within the matrix (the extent to which IT approaches support the business approaches). The authors argue that a company must consider both "strategic fit" (vertical alignment) and "functional integration" (horizontal alignment) to fully develop its competitive potential (p. 29).

Using the two-by-two matrix, the authors describe four perspectives on developing a cohesive strategy. Each perspective starts with a company determining either its business strategy or its IT strategy. Building on that foundation, the company then moves one square either horizontally or vertically in the matrix, and determines its optimal policy for that square. Finally, the company moves to the next adjacent square and determines what approach best suits its selected overall strategy.

For example, in the first perspective, entitled "Strategy Execution," the company begins by determining its business strategy (p. 29). The

3. The full names of the Organizational Infrastructure and IS Infrastructure boxes are "Organizational Infrastructure and Processes" and "IT Infrastructure and Processes," respectively (p. 26). For the sake of brevity, they are referred to by their shortened titles throughout both the book and this review.

Figure 1

	Business	IT
External Strategy	Business Strategy	IT Strategy
Internal Structure	Organizational Infrastructure	IS Infrastructure

company then moves vertically (downward) to the organizational infrastructure box, where it determines what infrastructure would be ideal to support the strategy it has selected (pp. 29-30). Finally, the company determines what characteristics its IS infrastructure should have so as to best complement its desired organizational infrastructure and business strategy (p. 29).⁴

The Strategy Execution perspective is the "classic hierarchical view of strategic management" — top management is the "strategy formulator," and the information systems are designed so as to best implement the strategy (p. 29). This perspective has recently expanded to include efforts, like those in reengineering initiatives,⁵ to use information systems to radically redesign organizational processes (p. 29).

The other three perspectives that the authors describe follow similar triangular patterns around the two-by-two matrix (pp. 30-32).⁶ The discussion of these different approaches, exploring how business strategy can drive IT strategy and vice-versa, is very interesting from a theoretical perspective. The drawback is that the discussion is abstract and far-removed from the difficult issues companies face when their strategic thinking shifts from the "10,000-foot view" to the more particular issues of implementation.

4. Companies following the Strategy Execution perspective do not explicitly visit the IT Strategy box. The authors note that the driving force in this perspective is the company's business strategy (p. 29).

5. For a more detailed discussion of using information systems to effect radical change in business processes, see generally MICHAEL HAMMER & JAMES CHAMPY, *REENGINEERING THE CORPORATION: A MANIFESTO FOR BUSINESS REVOLUTION* (1993).

6. These strategies are entitled "Technology Potential," "Competitive Potential," and "Service Level." "Technology Potential" companies begin with their business strategy, then determine an appropriate IT strategy, and finally establish which IS infrastructure is necessary to support their chosen IT strategy (p. 31). "Competitive Potential" companies start with IT strategy and then create a business strategy based on this IT strategy. Finally, these companies create an organizational structure that is appropriate for the chosen business strategy (pp. 31-32). "Service Level" companies also begin with IT strategy, but then determine an appropriate IS infrastructure that in turn determines which organizational infrastructure is needed (p. 32).

The remainder of the book is divided into four parts, each based on one of the basic elements of the Strategic Alignment Model. Although occasional efforts are made to tie the articles back to the analysis presented in Chapters 2 and 3, the articles are independent works, and have only limited connections to the original Strategic Alignment Model. The chapters are often distilled from larger, previously written works, and the editing process is imprecise in places.⁷ These imperfections, which reflect the cut-and-paste nature of the articles, can confuse the reader, particularly during the more abstract analyses.

The portions of the book covering Business Strategy and Organizational Infrastructure largely deal with subjects that are unrelated to IT. The most relevant article discusses some of the cutting edge competitive strategies and briefly reflects on how IT makes the different strategies feasible.⁸ The authors first describe two long standing business models: mass production and invention. Traditional mass production companies focus on delivering a homogenized product at minimum cost, while traditional invention companies focus on delivering highly differentiated products that are developed in a free-wheeling corporate atmosphere that pays less attention to cost (pp. 76-79).

The authors argue that the leading corporations use competitive strategies that avoid the classic trade-offs between the mass production and invention models (p. 79). Specifically, they identify two strategies, "Continuous Improvement" and "Mass Customization," which allow companies to maintain low costs while still having innovative products and/or processes (pp. 80-86). Continuous Improvement companies produce a stable product line and focus on developing better manufacturing and customer service processes. These companies operate like traditional mass production companies, except that they are quicker to make improvements to the ways they manufacture products and service customers. They produce homogenized products as mass production companies do, but are able to achieve both lower costs and greater customer satisfaction. IT plays a key role in this strategy by allowing the company to implement improvements in its manufacturing operations more quickly (pp. 80-83).

Mass Customization companies, on the other hand, seek to realize the low costs of a mass production company while allowing the customer

7. A typical imperfection is seen on page 165, where the writer states five categories of IT opportunities and then begins to describe them over the next nine pages. The descriptions initially seem to follow the writer's stated order, but other, marginally related concepts are interjected and some of the five stated categories of IT opportunity are in fact ignored.

8. See Bart Victor et al., *Aligning IT with New Competitive Strategies* (pp. 73-96).

a great deal of flexibility in specifying the particular characteristics of the product. These companies use IT to align their output more closely with what their customers want. Improved communications technology allows these world-class companies to instantly transmit customer orders to both the plant and the purchasing offices. IT also allows the plant to reduce its cycle times, enabling it to carry lower inventories, as well as to produce more made-to-order products (pp. 83-86). This article usefully describes how IT may be employed to fundamentally improve a company's business model.

The other three articles in the sections on Business Strategy and Organizational Infrastructure describe the impacts and imperatives of globalization,⁹ business culture¹⁰ and change management.¹¹ Although these chapters raise some interesting points, they do not add anything to work that has already been done in these areas, and do not adequately integrate IT into their discussions. The articles are good summaries of some of the basic issues, and would be useful for a reader who is not familiar with the topics. A person who is looking for a thorough discussion of these areas, however, would be better off looking elsewhere.¹²

The highlight of *Competing in the Information Age* is its discussion of IT Strategy,¹³ and in particular the first two chapters of the section. One chapter, by noted commentator Peter Keen,¹⁴ describes a number of ways in which IT can improve a company's operations. He observes that IT has allowed companies to use time as a competitive weapon in a variety of ways (pp. 145-48). First, companies have used electronic data interchange and automated ordering systems to effect just-in-time inventory, reducing working capital requirements. One example Keen points to is the relationship between Wal-Mart and its suppliers. Customer order data from every Wal-Mart branch is scanned and transmitted directly to the suppliers' warehouses, which are then able to schedule replenishments as needed (p. 166). Wal-Mart is thereby able

9. See John L. Daniels & N. Caroline Daniels, *Building Global Competence* (pp. 97-133).

10. See Janet C. Caldwell & John B. Kirby, *Business Culture: The Key to Regaining Competitive Edge* (pp. 293-317).

11. See William H. Davidson & Joseph F. Movizzo, *Managing the Business Transformation Process* (pp. 322-58).

12. On the topic of globalization, a reader could investigate JOHN L. DANIELS & N. CAROLINE DANIELS, *GLOBAL VISION* (1993), on which the chapter on globalization is based, or CHRISTOPHER A. BARTLETT & SUMANTRA GHOSHAL, *MANAGING ACROSS BORDERS: THE TRANSNATIONAL SOLUTION* (1989). The authors of the chapter on business culture included a helpful bibliography of relevant books (pp. 295-97).

13. Although the IS Infrastructure section of the book is only one chapter, the articles in the IT Strategy section also provide some discussion on IS infrastructural issues.

14. See Peter G.W. Keen, *Do You Need an IT Strategy?* (pp. 137-78).

to cut down on its purchasing and logistics costs (p. 166). Second, time-based competition has accelerated the product development process, from the initial market research, to the integrated design of the new product, to the roll-out of the product. Keen points to product development in the auto industry, where computer-aided design and manufacturing has helped to cut time-to-market by fifty percent. As a result of this shortened development time companies may reduce the average age of their product lines, remaining more true to continuously evolving consumer tastes (p. 146).¹⁵

In addition to the discussion on the benefits of time-based competition, Keen includes a brief but excellent analysis of how a good IT strategy can improve profitability. On the revenue side, IT's ability to improve customer satisfaction can improve customer retention. Furthermore, strong technological capabilities can allow companies to offer new services to consumers, and to sell their IT prowess to other companies (p. 174).

On the cost side, Keen also introduces a few interesting ideas. First, businesses can use IT to develop "location independence" — they can "[b]ring work to people, not the other way around" (p. 172). For example, many companies using "800" numbers have consolidated their operations in Omaha, Nebraska, increasing their economies of scale by reducing per-unit overhead expense and obtaining bulk discounts for telephony capacity (pp. 172-73). Second, businesses can "recreate organizational simplicity" (p. 173). By automating processes, a company can remove entire levels of bureaucracy, thereby reducing cost and increasing responsiveness to customers (pp. 157-58).

The next chapter¹⁶ addresses one of the opportunities cited by Keen and others in the book — using IT to keep up with changes in customer preferences. The authors advocate changing a company's mindset and capabilities from "make-and-sell" to "sense-and-respond" (p. 179). While companies in the former category push their products onto consumers, sometimes in spite of the fact that consumer preferences lie elsewhere, the "sense-and-respond" companies design their products to fit what their customers want. The secret to success, the authors argue, is to minimize the time it takes to diagnose customer needs (sense) and then to design a product that meets those needs (respond) (pp. 180-82). The authors draw an interesting analogy to jet fighter pilots. The best dog fighters are those who have what the U.S. Air Force calls the fastest

15. For a more thorough discussion of time-based competition, see GEORGE STALK, JR. & THOMAS M. HOUT, *COMPETING AGAINST TIME: HOW TIME-BASED COMPETITION IS RESHAPING GLOBAL MARKETS* (1990).

16. See Steve H. Haeckel & Richard L. Nolan, *Managing by Wire: Using IT to Transform a Business from "Make-and-Sell" to "Sense and Respond"* (pp. 179-215).

“OODA Loops.” “OODA stands for observation (sensing environmental signals), orientation (interpreting the meaning of the signals captured), decision (selecting from a repertoire of available responses), and action (executing the response selected)” (pp. 184, 215). In the same way that a good pilot “reads” a situation and responds instantly, a world-class company is able to sense shifts in the competitive landscape and to quickly adjust its operations.

The authors of the article on “Sense and Respond” provide a simplified outline of how IT infrastructure capabilities enhance a company’s responsiveness. They divide IT infrastructure into three characteristics: connecting (sensing), structuring (interpreting), and sharing (coordinating decisions and actions). The connectivity characteristic is observed in the extent to which “the technological architecture links informational sources, media, locations, and users” (p. 203). Included in this dimension are the outside sources of data that are accessible and monitored by a company’s IT network, as well as the extent to which different departments can access each others’ files (pp. 203-05). By “structure,” the authors mean the way a company stores and analyzes data. When data is organized in a uniform method, and on a single platform or standard, managers in various parts of the company will better be able to use data received from other departments (pp. 205-06). Finally, by “sharing,” the authors mean the ability of a company to manage the flow of information and actions that arise from that data (pp. 206-07). In addition to enabling managers to access helpful data from multiple departments, it is critical that the actions taken are coordinated with the efforts of others in the company. “Anyone who receives multiple premium notices on the same day from the same insurance company for different policies is on the receiving end of an informational infrastructure with a multiple personality disorder” (p. 207).

While both of the above chapters present valuable ideas on how IT can improve a company, neither chapter gives much practical guidance as to the implementation of changes. For example, Keen seems to have written his short discussion on implementation for non-IT senior executives — his primary message is that senior executives should not be intimidated by the technical jargon that pervades IT (p. 154) and should instead focus on creating a set of “big rules” for the IT department to observe (p. 152).¹⁷ These big rules, which themselves should be in harmony with the company’s overall business strategy, can then be used as the guiding principles upon which more specialized executives can design an IT strategy and infrastructure (p. 154). Keen also points

17. For example, a big rule at a company dedicated to making information easily transferable between every division might be: All departmental systems must be compatible with one another and use similar standards whenever practicable.

out some of the common pitfalls, including lack of communication between the IT department and the rest of the company, and a general lack of a clear, overarching vision (which leads to disarray as departmental leaders follow different interpretations of the strategy) (pp. 155-56). Although these pointers are conceptually useful, they are not sufficiently detailed to give an executive a clear vision of how to implement a company's IT strategy.

In general, the first two-thirds of the book argues a point that the reader already knows — IT is important — but fails to give clear guidance on *how* to reap the benefits. At best, the reader is left with only some lists of abstract factors to be aligned, and generic catechisms like: avoid situations where “[b]usiness and IT are going in different directions with poor communication and interaction between them” (p. 46). Throughout the text, the various authors allude to some of the tough issues, such as how a company should balance the need to maintain IT flexibility against the need to keep costs low. To the reader's growing frustration, however, these questions are largely left unanswered to this point in the book.

Toward the end of the book, though, there are two chapters that seem to explain two key steps in implementation — benchmarking IT strategic alignment,¹⁸ and measuring the value of IT investments.¹⁹ Both chapters start with a powerful articulation of the importance of their topics. The chapter on benchmarking by Patti Prairie begins: “Achieving alignment between business and IT continues to top the priorities lists of executives and so does the key question of *how* to do it. . . . One approach that has proven quite effective is the use of IT strategic alignment benchmarks” (p. 243). At last, it seems, there is a chapter that will move from the *why* (why have an IT strategy?) to the *how* (how do we do it?).

Unfortunately, more disappointment follows. The chapter begins with a description of an IT study performed for American Express that explored the best IT practices of a selected group of other top-performing companies. Prairie first gives a general overview of how to conduct a benchmarking study, which would be helpful for someone who has never conducted such a project before (pp. 246-51). She also supplies some of the IT-specific questions that the study asked, which again would be helpful as a starting point for a company that wished to conduct its own

18. See Patti Prairie, *Benchmarking IT Strategic Alignment* (pp. 242-90).

19. See Peter Weill et al., *IT Value and the Role of IT Infrastructure Investments* (pp. 361-84).

study.²⁰ Among the places in which this chapter lacks depth, however, is in the description of the *findings* of these various studies. Consider the findings of the American Express study:

In the best companies, senior management in both business and IT displayed significant vision, provided strategic directions, and were committed to rigorous planning and execution. All across these organizations, including the relationship between departments and divisions, there was a feeling of trust and a team orientation. HR [human resources] were emphasized, and in the IT organization motivation and training were considered to be very important (p. 255).

In other words, the best companies did well because the leaders were good leaders, because the different departments worked together, and because the employees were well-trained and well-motivated. While undoubtedly true, these findings are hardly insightful; one can't help but wonder about how much American Express paid for this research.

To be fair, the remainder of the chapter discusses a more comprehensive study — the IBM IT Transformation Benchmarking Project. Although the presentation of this project's findings is more fleshed out than that of the American Express study,²¹ the description still does not come close to answering the deep questions that the rest of the book has raised. What is most aggravating is that the author frequently tantalizes the reader with unexplained examples of how useful benchmarking studies can be. The author describes attractive end-states while never explaining how the company got there.²²

20. Unfortunately, the author ducks some of the most difficult questions around designing benchmarking surveys, such as what metric should be used to evaluate various capabilities. How can a company quantitatively measure the integration between IT and business strategy? How can a company measure how well a system's capabilities mesh with the actual needs of the users? The author simply states that "agreed-to measures of performance don't exist for many IT processes" (p. 252).

21. This is not a high hurdle to meet. The IBM study results cover only one-and-one-half pages of the article, with observations that, although more detailed than those of the American Express study, are hardly revelations (pp. 268-70).

22. For example, the author related the following anecdote, which arose from the IBM benchmarking project:

One multidivisional company with a typical *stovepipe* or *silo* organization, where each line of business has its own IT department and systems, knew that it was running redundant IT activities on the order of 35% and recognized the problem but never found a way to crack it. However, thanks to initial benchmarking against another multiproduct company that did not stovepipe, its IT organization was

It may not be fair to expect Prairie's chapter to develop *all* of the insights gained from benchmarking initiatives, as that is a task that itself could fill a volume. Unfortunately, however, the other chapters in this book do not pick up enough of the slack. The final chapter,²³ which describes how to evaluate the return on investments in IT, is an example of this. Again, the authors do an excellent job of describing a well-known problem: the benefits of IT investments are often difficult to track and quantify (p. 366). As companies become more focused on return-on-investment and economic-value-added, there is increasing pressure to have a solid financial justification for every capital expenditure. This dynamic creates problems for executives who are trying to convince senior management to undertake an expensive new IT initiative with ambiguous benefits (p. 164).

Once the problem is on the table, however, the authors do little to solve the quandary. Although they do have a helpful general discussion of where value in IT "comes from,"²⁴ they do not even begin to offer an framework for measuring the value of IT. The authors liken investments in IT to investments by government in the public infrastructure (e.g., roads and bridges) (p. 371). They note that these investments "add to the community in ways that could not be achieved through end-user or private investment" (p. 372). Among the compelling similarities between IT and public infrastructure investments, the authors contend, is that "[b]oth types of infrastructure are difficult to cost justify in advance, and it is difficult to show the benefits of each in hindsight" (p. 373).

Even accepting the intellectual validity of the analogy, it still seems unlikely that many advocates of IT investment would feel comfortable bringing nothing but this explanation before a board of skeptical colleagues and trying to persuade them to increase IT spending. Ultimately, the authors of this article have introduced a difficult question and have answered it by saying: "It is too difficult to answer."

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able to develop new cross-business systems and increase efficiency and lower operating costs dramatically (p.268).

After hearing this story, the alert reader will wonder how the company was able to achieve such a powerful result. Unfortunately, no concrete explanation is given, in this chapter or any other, as to how a company can implement a process to achieve these goals.

23. See Weill et al., *supra* note 19.

24. The authors argue that companies pursue IT initiatives with three mindsets: the "utility" approach, where the infrastructure investment allows cost savings via economies of scale; the "dependent" approach, where investment is for the purpose of meeting the need of a particular strategy; and the "enabling" approach, where infrastructure advances give a company the newfound flexibility to pursue different strategies (pp. 374-75).

Although this review has been generally critical, *Competing in the Information Age* does provide a good overview of the macro-issues involved in the creation of a well-aligned IT strategy. The discussions on globalization and business culture²⁵ are best suited for an IT executive who does not have as much experience on the business side of management. The discussions on IT strategy are well suited for a reader who is largely unfamiliar with the current thinking on IT.

A key source of disappointment is the lack of depth. Many of the most difficult questions in IT strategy are either ignored or too quickly dismissed, badly limiting the extent to which the book makes a contribution to the field. This is partly the result of the structure of the book itself — as a compilation of articles, there is little connectivity from one to another. While this allows the reader to consider a variety of IT and non-IT topics, it also means that the reader is left to draw insights from a collection of inadequately developed essays. The book is a jack of all trades and a master of none. It would have been preferable to remove the non-IT chapters, leaving those subjects to works specializing in them, and to devote more space to fleshing out the many interesting but insufficient discussions on IT. *Competing in the Information Age* should have focused on its core competency — discussing IT strategy — and outsourced the rest.

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25. As mentioned earlier, the chapter on globalization was part of the section on Business Strategy, and the section on Organizational Infrastructure included chapters on business culture and change management.

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