Breakthrough Management

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published by Productivity Press, 2001

Breakthrough Management

Principles, Skills, and Patterns for Transformational Leadership

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and

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PUBLISHER:

Confederation of Indian Industry
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Tel: 011-24629994-97

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isbn978-81-903564-3-5
345678910
First printing, August 2006 in India
Second printing, October 2006 in the USA
Third printing, 2007 in India
Fourth printing, 2016 in India
See www.walden-family.com/breakthrough for corrections.

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Preface

For many years we, and particularly Shoji Shiba, have been investigating the management of business breakthrough, or transformative change (Shiba98, Walden93). Shoji Shiba has observed and run workshops on breakthrough management throughout the world. Our previous book, *Four Practical Revolutions in Management* (Shiba01), included a chapter on breakthrough management.

In 2003 Shoji Shiba published a book titled *Breakthrough Management* in Japanese (Shiba03). Well received in Japan, the book won the 2004 Nikkei Quality Control Literature Prize for which it was nominated by the Nikkei QC Literature Prize Subcommittee of the Deming Prize Committee. The Japanese edition of *Breakthrough Management* went beyond discussing concepts of business change; it also provided a concrete methodology through which businesses could identify and expand into new business areas.

This present book is a summation of our thinking on breakthrough management as of early 2006. It is a major revision and update, not simply an English translation of Shoji Shiba's 2003 work. We include here new concepts and more case studies of change, examples from countries other than Japan, and details of how to practice the relevant individual skills.

A note about our case studies: While most of our cases describe quite recent activities of various organizations, some are about activities that took place a decade or two ago, and we mention in passing some even older examples. Many leadership lessons do not become obsolete even when the details of a particular business situation are no longer relevant. A company manufacturing personal computers today and facing the potential for their replacement by a newer technology (perhaps something more integrated with cell phones or DVD players) might do well to study the example of a minicomputer company that closed its eyes to the then

future potential of personal computers. As the saying goes, "Those who cannot learn from history are doomed to repeat it."

Today need for breakthrough often arises because of business globalization. Thus, this book includes many examples of companies that are struggling with and dealing with the effects of globalization. The book is for English-language readers not only in North America and western Europe but in all countries where there is rapid business change and development, as in Eastern Europe and Asia. We have included case studies from countries in Asia, Europe, and North America.

Our target readers are people in companies that are trying to move into new business areas for whatever reason or that must compete on a large geographic scale — nationally or internationally. Most specifically, we are writing for official leaders of companies as well as for change leaders within companies or other organizations who are trying for change and/or have the freedom to change. The methods we describe apply to all types of activities — product or service, nonprofit or for-profit, charitable, religious, manufacturing, health care, and so forth.

The first two chapters of the book introduce the importance of breakthrough in today's rapidly changing, globalized world. The last section of Chapter 2 (Figure 2-14, page 40) introduces the remaining eight chapters, which discuss principles, skills, and models of business transformation.

Many people and businesses, of course, do not have the freedom to change. For instance, the local plumbing contractor must do business within the conservative constraints of the national construction industry and local regulations. This book is not aimed at readers in such circumstances, although we think they can still learn something from reading it.

We ourselves have learned an enormous amount while working on this project, and we continue learning as the book goes to press. Like business breakthrough itself, the study of breakthrough is an open-ended process.

Shoji Shiba and David Walden
July 2006

Acknowledgments

Many people helped and supported us in the preparation of this book, and our appreciation and thanks go to them all.

Developing the content

We have described many real business cases and management experiences from our research and studies. These accounts highlight the great wisdom human beings are capable of, and we have great respect and appreciation for the participants in these examples.

Much of this book was based on Shoji Shiba's lectures in MIT's Leaders for Manufacturing (LFM) program, especially in the years from 2000 on. Many guest speakers have contributed to the course. Alex d'Arbeloff, Greg Fischer, Matabee Maeda, and Ray Stata kindly spoke to the class over several years. The insights of these guest lecturers and business leaders are key elements of this book.

Teaching these methods in the LFM program helped Shoji Shiba improve many of the ideas and their presentation. The students' excellent comments and class discussion often led to the development of new ideas or to the reshaping of existing ideas. We thank all the LFM fellows and others who attended the classes from the MIT Sloan School of Management's Sloan Fellow, Management of Technology, and MBA programs.

We also thank the participants in Shoji Shiba's Breakthrough Management seminars all around the world. Interaction with seminar participants strengthened the concepts, tools, and examples we present in this book and made the contents richer in many ways.

Five people especially supported the process of creation of the breakthrough concept and tools by connecting Shoji Shiba to numerous management leaders over the past two decades: Bertrand Jouslin de Noray, Martine Morel, José Miguel Carreño, Louis Balme, and Eric Bergemann.

Kenji Murakawa collaborated with Shoji Shiba to write a 56-page "textbook" for Japan's 1999 Quality Month. This provided an important trial run as we formulated the breakthrough concept. The publication of Shoji Shiba's *Breakthrough Management* in Japanese (Shiba03) helped perfect the concept, and our thanks go to Kenkichi Yamashita and Shinichi Kojima of the Toyo Keizai publishing company.

In addition, Shoji Shiba's recent work with the Confederation of Indian Industry, the MIT Sloan School of Management's China project, and the Shanghai Center for Quality of Management strongly influenced this book by helping us see how to apply breakthrough concepts and tools in rapidly changing societies.

Several key people supported our work at MIT; our thanks go to Steve Graves, Lester Thurow, Toby Woll, Eric von Hippel, Bill Hanson, Don Rosenfield, and Lois Slavin.

The late Tom Lee was instrumental in providing Shoji Shiba with an opportunity to work in the United States and at MIT. Tom also gave David Walden an opportunity to teach at MIT, and he brought the two of us together. We miss him and greatly regret that he did not live to see the publication of this book.

Ray Stata, a truly noble man, has encouraged and supported our work continuously since 1999; his ongoing support encouraged us to finish this book.

Writing and publishing the book

The text in several passages in this book is footnoted as being drawn without much rewriting from our previous book (Shiba01), which had a chapter on breakthrough among 28 other chapters on improving an existing business. This text is reused with permission from *Four Practical Revolutions in Management: Systems for Creating Unique Organizational Capability*, by Shoji Shiba and David Walden, Copyright © 2001, 2000, 1999, 1998, 1993 by Center for Quality Management, Published by Productivity Press, a division of the Kraus Organization Ltd (`www.productivitypress.com`). We thank Maura May, publisher, for granting this permission.

We have included extensive source notes and references, directing readers to original sources and attempting to give due credit to colleagues and authors from whom we have learned. However, as we have lectured and written over the years on the evolving content of this book, some ideas or phrases originated by others may have become so familiar that we now do not recognize them as other than our own. If you spot something that you think should be credited to someone else and isn't, please let author Walden know. We will post updates to our book website (www.walden-family.com/breakthrough) between printings.

The following people helped us develop the ready-to-print manuscript for this book. Jay Howland edited the book. Janice Hall (TTF Design, janice.hall@verizon.net) rendered the figures. Steve Peter (Beech Stave Press, www.beechstave.com) helped with design and layout. Elaine Payne (www.elainepayne.com) helped with proofreading.

Sarita Nagpal and her colleagues at the Confederation of Indian Industry helped facilitate publication in India — in particularly, V.K. Trivedi for the first printing and Kalpana Narain for the third printing. Kalpana also did another proofreading scan and found another couple of dozen typographic errors.

The public library in Sandwich, Massachusetts, provided many books we needed in which to look up sources, although library staffers often had to obtain books from other libraries in the Old Colony Library Network or from other Massachusetts libraries. We are grateful to all the libraries that helped us, and particularly to the librarians and other library staff and volunteers.

Many other people supplied useful information or insight or otherwise supported our work on the book. The Cape Codder Resort and Spa of Hyannis, Massachusetts — particularly front desk manager Cindy Johnson — provided us a comfortable venue during the week we spent planning this book. In addition to Eric Bergemann, other employees of the Center for Quality of Management facilitated our efforts, including Silja-Riitta Dandridge, Linda Pizzotti, Moriah Tumbleson, and Lucinda Doran. David Dobbin and Bob Barbour facilitated our use of images from Dale Farm annual reports. Kaija Poysti answered questions about Finnish culture; Hans Hagen answered questions about Dutch culture.

MIT Venture Mentoring Service director (and interim MIT executive vice president) Sherwin Greenblatt and operations manager Roberta McCarthy provided information on their activity. Earl Jones gave us insight about MIT's Leaders for Manufacturing program. Ed and Susan Barrett welcomed author Walden into their East Sandwich shop when he needed a break from typing.

Our families

Shoji Shiba: I thank my wife, Mieko, for insightful comments on my work and for her encouragement and support over the past 43 years. In addition, I thank her for her recent support of my elderly mother in a hospital near our home in Japan, which freed me to work for periods of time outside of Japan and away from home. Without Mieko's help my work at MIT and elsewhere could never have been realized.

David Walden: I thank my wife, Sara, for her efforts in helping take care of my elderly mother, who was living with us during much of the time this manuscript was being drafted. I also have enjoyed and benefitted for 40 years from Sara's parallel interest in writing; I am particularly fond of the recent rearrangement that has brought our desks and keyboards together, side by side, in the same room.

Part 1: Surviving in a Changing World

Chapter 1

Rapid Change in a Global World

We are in an age of enormous change in business and industry. While there is significant change in the United States and in Europe, the most dramatic changes are happening in Asia, particularly in China and India. These changes impact the whole world. They may threaten the position of the United States in the rest of the world.

Change can be a source of opportunity for a business. It can also threaten an organization's survival. If your business involves commodity products — products that can be replicated elsewhere in the world — the question you face is how to find the opportunity in change and thus survive.

1.1 Change from China

Until recently Hiroshi Okuda was chairman of Toyota. He also was chairman of Keidan-Ren, the most powerful organization of CEOs in Japan. On November 11, 2003, CEO Okuda, in his capacity of chairman of Keidan-Ren, gave a presentation to a gathering of top Japanese business people, executives, and managers. In his presentation he noted:

> China has become the world's top producer of steel, small-sized motors, and home electrical appliances such as refrigerators.
>
> Fast development in these areas has been a result of two important factors:
>
> - foreign investment in China
> - the high quality of the Chinese workforce
>
> The quality of the workforce in China is superb. As an example, sup-

> pose you needed 10 workers and listed the following qualifications in your advertisement:
>
> - 20–24 years of age
> - right-handed
> - eyesight better than 2.0 [20/20]
> - height 155–165 cm
>
> You would surely have 100 qualified applicants the following day. In addition, those people would be eager to work overtime as well as Saturdays and Sundays. Their pay would be about one-twentieth that of similar workers in Japan.
>
> Japan cannot compete with China in the production of like products. China has an enormous competitive advantage in its quality of workforce. We must clearly understand that competition is not possible in the field of "commoditized" products.
>
> What do we do, then, for future survival?

What Okuda said about Japan's difficulty in competing with China is true for the rest of the world as well. Labor used to be cheap in Hungary, Ireland, Spain, and so forth, but these countries now have difficulty competing with the labor available in China. And, of course, labor in the United States has not been cheap for many years.

China also is driving out the competition in other countries' home markets. A few years ago there was a manufacturing company in Budapest, Hungary, that made train equipment, but the company went bankrupt. In October 2004, Shoji Shiba visited and photographed the Személybe Járar (Four Tigers Market) that now exists in the train factory location (see Figure 1-1). The manufacturing environment is still intact — for instance, there are large industrial cranes on tracks running along the ceiling (see Figure 1-2); but by 2004 the factory buildings were home to rooms full of clothes, lingerie, and toys imported from China. Street stalls located between the buildings sold casual clothes and shoes out of shipping containers that opened into retail sales spaces. Hungarian industry cannot compete with these products.

Interestingly, the people working in the Four Tigers Market are largely Chinese, not Hungarian. We are not sure how they come to be in Hungary.

Figure 1-1. Top: Exterior of former train equipment factory in Budapest, Hungary. Bottom: Reused building — the Four Tigers Market.

Figure 1-2. Interior of the former train equipment factory.

The manual labor workforce is not China's only excellent workforce. The workforce of Chinese knowledge workers is also developing; many Japanese companies now outsource software work to China, and Microsoft's research center in China has been described in the U.S. business press. Soon it may be hard to compete with China in the area of knowledge work as well as in manual work.

More than that, the Chinese are developing excellent management skills. Since China opened itself to participation in the World Trade Organization (WTO), globalization has become a primary task of Chinese managers. China set the goal of becoming the "plant for the world," and is succeeding in our view. An article in the December 24, 2004, issue of the *New York Times* ("In Roaring China, Sweaters Are West of Socks City," pp. A1, C3) described how the city of Datang, China, specializes in manufacturing socks — 9 billion pairs of socks a year. The article said that to the west of Socks City were Sweater City and Kids' Clothing City. To the south . . . Underwear City.

China is promoting the management training required for globalization — "globalization management training" — on three fronts:

1. joint ventures with foreign firms
2. government Department of Labor qualifying examinations for managers
3. diffusion of MBA programs

Joint ventures with China have been frequently documented in the United States business press.

The people of China have a *long* history of qualifying for higher positions by way of examinations. Thus, it is quite natural for China to establish qualifying examinations as a component in promoting the management training required for globalization. There are three grades of examinations. The grade 3 examination qualifies a person to be a middle manager. Grade 2 relates to being a vice president. Grade 1 is to be a CEO or COO. The grade 3 and grade 2 training and examination systems have been operating since 2002. In parallel with setting up qualifications and examinations for three levels of management skill, the Chinese government has established training mechanisms for the examinations. The

grade 1 system began operating in 2004 with an 18-week, two-days-a-week course.[1]

Beijing University is offering an International MBA. Its promotional literature says, "If you want to be a CEO in the new century, this school is a 'West Point' for management." The teaching is done in English, often in weekend sessions that students can fit in with their existing jobs. Such international MBA programs also are available at other prestigious universities, among them Chinhua University in Beijing, Fudan University in Shanghai, and Lingnun University in Guang Zhou. Some of these programs have alliances with foreign universities, for instance, with the MIT Sloan School of Management.

In China, management education, specifically an MBA, has become a qualification to become a manager. In another break with the past, people are becoming senior managers at younger ages, especially when they have an MBA. For instance, in the management team of the company Suzhou in 2001, the president was 37 years old year and had an MBA, the plant manager was 40 with an MBA, the sales director was 44 with a BA, the marketing manager was 38 with a BA, the IT manager was 37 with a BA, the quality manager was 32 with a BA, the financial manager had an MBA, and the logistics manager was 40 with a BA. In the past, long seniority, possibly based on a rise from the factory floor, might have been more common in Chinese companies.

Also, in at least one well-publicized instance, a Chinese company purchased a U.S. business partly as a way of getting more management talent. In late 2004 IBM announced the sale of its personal computer business to the Chinese company Lenovo. An article in the December 28, 2004, *New York Times*[2] suggested that at least part of the reason for this purchase by Lenovo was to acquire the experienced management team that came with IBM's personal computer business.

These rapid changes are perceived within China as well as outside. In 2002, 2003, and 2004, Shoji Shiba asked his students in the international MBA program at Fudan University about changes in Shanghai. Each year he led the students through a process to rank the areas of greatest change in Shanghai. Table 1-1 summarizes the results of the analysis of the students' perceptions.

Table 1-1. Perception of recent change in Shanghai among Fudan University I-MBA students

	2002	2003	2004
Infrastructure	53.8%	38.8%	38.6%
Globalization	20.0%	41.8%	9.1%
Social life	25.4%	19.4%	52.3%
Number of students	67	67	44

As shown in the table, the perceived area of greatest change moved in three years from infrastructure to globalization to social life — a big shift over a short period.

By change in *infrastructure* the students meant changes in buildings; highways, subways and bridges; environment (water, green space, etc.); population inflow; and income and gross domestic product. *Globalization* referred to foreign companies (joint ventures, branch offices, investment, etc.); foreigners (business people, foreign students, etc.); and language schools as well as to worldwide events. Changes in *social life* were described in less tangible terms but included:

- new styles of consumption — new consumer goods (cars, clothing, etc.) and more opportunities for consumption
- new social trends — demographic changes (increasing numbers of people coming to Shanghai from the country and the reverse)[3] and new mentalities (e.g., divorce)
- unfavorable effects — congestion (e.g., cars), layoffs by some companies (as China's planned economy ended), rising costs (housing, etc.), and so on.

In addition to providing severe competition to businesses throughout the world, China will have a big impact as a market itself. For instance, an article in the July 12, 2004, issue of *Nikkei Business* forecasts the change in the worldwide car market between 2003 and 2020. In this forecast the markets in the United States and Europe do not grow expansively — they are saturated. However, the number of cars produced for the domestic

market in China goes from 439×10^4 to $1{,}700 \times 10^4$. The same is likely to happen for other types of products.

Yet the pace of change in China is such that even Chinese companies sometimes struggle to compete. On December 25, 2005, at a training seminar of the Shanghai Center for Quality of Management (CQM) for the grade 1 qualifying examination, Shoji Shiba worked with executives such as chief executive officers, chief operating officers, vice presidents, and directors of large- and medium-scale companies in the Shanghai area and asked them, "What is the biggest change in your business in 2005?" There were many answers, but the responses could be boiled down into a few categories:

- The cost of labor and materials increased.[4]
- The exchange rate had a big effect.
- Competition became harder and harder.
- The price for the product went down.
- The export market increased [a good thing].

In response to the follow-on question, "What did you do about it?," the answers fell into the following groups:

- Move the factory away from Shanghai to where land and labor is cheaper.
- Try a new product mix.
- Restructure the company.
- Improve quality.
- Change the mentality of management.

In response to a further follow-on question about results, it became clear some companies had done better in 2005 and some had done worse. In Shoji Shiba's small sample, six companies reported increased sales, while three reported decreased sales. Two reported a profit increase, and four reported a profit decrease. A couple reported opening new markets.

In general, the change now underway is enormous. Some things that were true as recently as 2003 are no longer true. For instance, Figure 1-3 shows the change over the years 2000–2005 in different countries' shares of the internal automobile market in China. Almost all automobiles or automobile parts sold in China are now made in China, although in many cases the Chinese makers are in joint ventures with foreign companies;

furthermore, Chinese companies are increasingly producing automobiles themselves with technology and knowhow obtained from their foreign partners.[5]

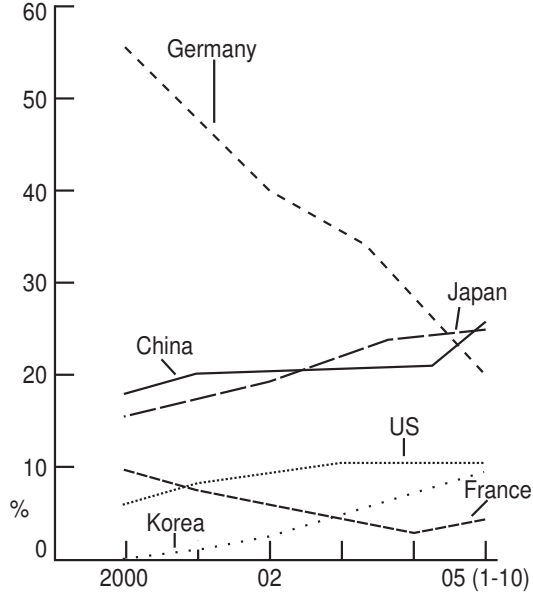


Figure 1-3. China automobile market by country. (From *Nikkei* newspaper, December 8, 2005.)

Shoji Shiba, who travels the world studying and teaching business, has never seen a country change so fast. For example, developments in China are proceeding much faster than the changes he saw in Japan in the 1960s and 1970s. It seems inevitable that the changes in China will continue to jar the rest of the world for years to come.

1.2 Change from India

Another major venue of change — and source of change in the rest of the world — is India. If China wants to become the "plant of the world," India seems on its way to becoming the "back office of the world."

In particular, India is trying become a major software center for the

world. As shown in Figure 1-4, between 1995 and 2004 the value of export software work taken in by India rose from $.7 billion to $15 billion. Over the last four years of the period, the value doubled.

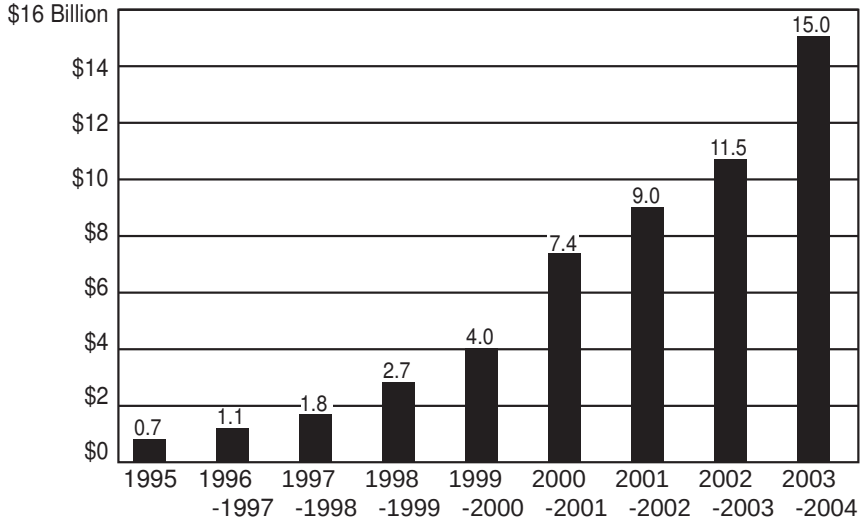


Figure 1-4. IT export work taken in by India. (Derived from *Fole*, October 2004, p. 5.)

Figure 1-5 shows why India is becoming a top-notch competitor in the software area. The vertical axis represents a measure of the "goodness" of available human resources in a country's software industry — a combination of the skill level and labor cost of engineers. The horizontal axis represents the number of highly qualified vendors of software. For our purposes here, the noteworthy aspect of this figure is that India has nearly caught up with Britain, the United States, and Japan in terms of the overall quality (capacity, skill, and cost) of their software industry.

A second strength of India in the changing buiness world is in manufacturing. In 1988 the Confederation of Indian Industry (CII) set up a Total Quality Management (TQM) division and began the intensive diffusion of quality methods. The level of quality of Indian industry has been such that 111 Indian companies were TPM Award Winners between 1995 and 2006. Similarly, 16 Indian companies won the Deming Prize and Japan

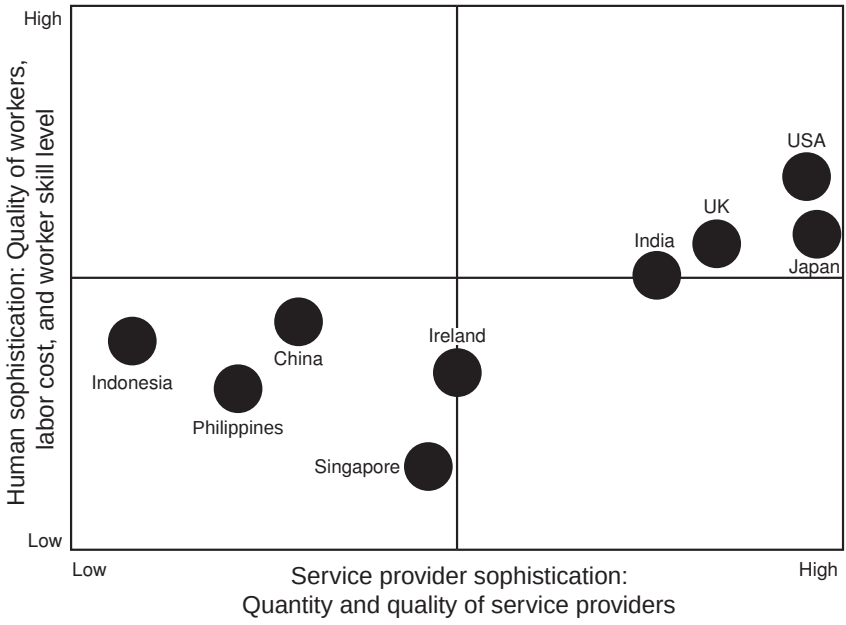


Figure 1-5. India IT positioning to capitalize on a global delivery model. (Source: Slightly adapted from Softbridge Solutions Japan Co. Ltd.)

Quality Medal. In the United States only two companies have ever won the Deming Prize (Florida Power and Light in 1989 and AT&T Power Systems in 1994). In Taiwan only one company has ever won the Deming Prize (Phillips in 1991).

Of course, in only a few countries do companies even bother to challenge the Deming Prize, which raises the question of why so many Indian companies have successfully sought the prize. The answer is that Indian companies are competing to be excellent; applying for the prize both provides a target for improvement and benefits a company's reputation. (That eight companies in Thailand have won the Deming Prize since 2001 may be indicative of another coming Asian competitive powerhouse.)

In a slightly different domain, at the International Conference on Quality Circles in Bangkok in December 2004, there were more participants from India than from any other country except Thailand. The level

of QC Circle activity in India today is comparable to the activity in Japan in the 1970s.

Another important component of India's drive for and success in improved quality in manufacturing is the embrace of cross-company mutual learning that we are seeing in several Indian industries. We describe this in more detail in section 10.1 (beginning on page 235).

Shoji Shiba was able to get a high-level view of India's industrial strategy on July 25, 2004, when he was invited to meet for an hour with Dr. A. P. J. Abdul Kalam, the president of India. President Kalam told Shoji Shiba that India has three types of companies:

- companies with an R&D capability to create unique technologies
- companies that license technology and do some design
- companies that do manufacturing according to a specification given to them

The issue in each case is how to push that type of company to a higher level.

The way Shoji Shiba's meeting with President Kalam came about brought home to Shoji Shiba the insight that one of the skills of great leaders is quick action at cutting through bureaucracy. Shoji Shiba was in New Delhi for three weeks giving a seminar. A seminar participant who was well connected in the government passed along to the president's office information about what Shoji Shiba was teaching. Immediately an invitation came to visit the president.

A similar thing had happened in Hungary in 1989 when Shoji Shiba was giving a seminar in Budapest, and the Hungarian minister of industry, Laszlo Kapolyi, invited Shoji Shiba to come directly to his office.

And, in another example in the United States, in late 1990 the term of Shoji Shiba's secondment from Tsukuba University to MIT had expired. When U.S. Secretary of Commerce Robert A. Mosbacher heard that Shoji Shiba had to return to Japan, he immediately wrote to the Japanese ambassador to the United States asking that Shoji Shiba be allowed to stay and help U.S. industry for an additional period of time.

1.3 Change in the United States and Europe

Even though the competition is strong, the United States has not been standing still. Since 1990 Shoji Shiba has been regularly visiting U.S. companies.[6] In 1990 no U.S. company Shoji Shiba saw practiced all of the elements of a world-class factory as defined by Czarnecki et al. (Czarnekioo, p. 78). By 1998–99, the best U.S. companies, including Intel, HP, Honeywell, and General Motors, had all of the elements of a world-class factory.

Another example comes from an informal survey of Shoji Shiba's students in MIT's Leaders for Manufacturing (LFM) program. The LFM students are highly qualified for graduate school and typically have several years of industrial or business experience before attending the program. In 2002 Shoji Shiba gave the LFM students a questionnaire to determine their awareness of quality methods that are common to world-class factories. As shown in Figure 1-6, the students were asked about a representative few items in a longer list of quality methods; also, the students did not discriminate between using and teaching a method (which is why the percentage figures span those two columns).

On average half of the students did not know about or had not heard of the various quality methods. However, the other half of the students did know of the methods, and a majority of those students had personally used or taught the methods. This was a significant change from our impression of our LFM students' awareness of such methods 5 and 10 years before. Shoji Shiba also believes that you would not find such a high level of awareness in any other country (not even in Japan where the level of awareness is now a bit less than it once was).

Historically, U.S. companies have been strong in strategy but weaker in operations than firms in some other countries. Since 1990, however, U.S. business has also achieved great strength in operations. For instance, the Boeing "moving line" production system for its 737 airplane includes standardization, just-in-time, and other techniques — all of the elements of a world-class factory. Incidentally, having a strong operations capability also facilitates globalization; without it, it is difficult to set up reliable factories outside the United States.

		Do not know/Have not heard of	Know	Personally used	Taught
Improvement Steps (7 steps, etc.)		57%	18%	25%	
7 Tools					
	Pareto				
	Cause and Effect	32	27	41	
	Checklist				
	Control Chart				
Affinity					
Tree Diagram					
5S		43	30	27	
Visual Factory		68	14	18	
Six Sigma					
Benchmarking					
Concept Engineering					
SPC					
Taguchi		58	40	3	
Experimental Design					

Figure 1-6. Student awareness of quality methods. (Based on a 2002 survey in MIT's LFM program.)

Since 1990 Japanese business has developed a decent capability in strategy but has lost some of its earlier capability in operations (with notable exceptions such as Toyota). Japan's loss of operations capability results from a shortage of manpower, the refocusing of top management's attention on strategy, and deemphasis on quality improvement training.

Even universities are showing signs of revolutionary change. The Massachusetts Institute of Technology, with which we both have been affiliated on and off over the years, has recently made a symbolic gesture toward a new kind of thinking. In Figure 1-7 (top), one of the MIT science buildings looks like it stood for efficiency. In contrast, the new Ray and Maria Stata Center shown in the bottom photograph clearly stands for

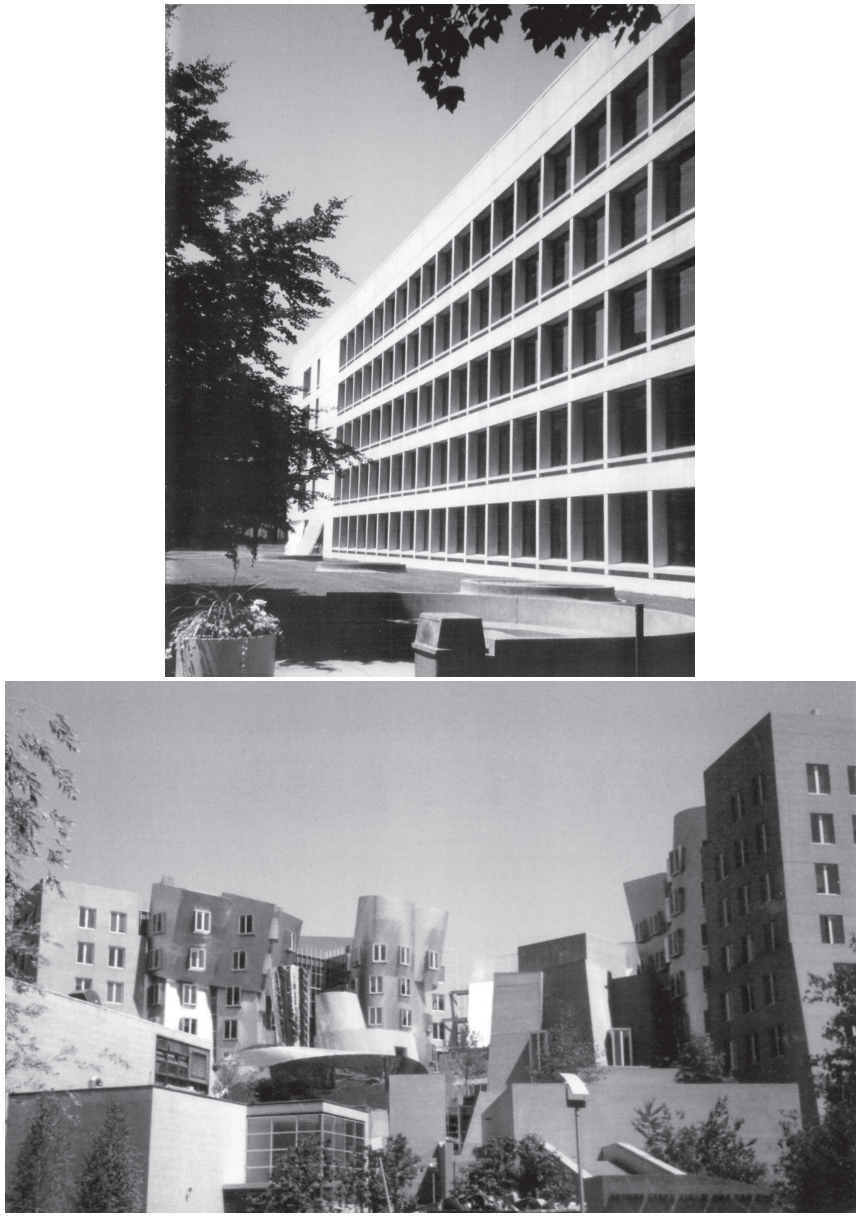


Figure 1-7. Top: Camille Edouard Dreyfus Chemistry Building, I. M. Pei architect, built 1967–70. Bottom: Ray and Maria Stata Center, Frank Gehry architect, opened May 7, 2004. The Stata Center houses the electrical engineering and computer science department and a few other groups.

something beyond efficiency. In the words of MIT president Charles Vest,

> On the threshold of a new century and millennium, MIT had the responsibility of . . . constructing . . . a new home for computer, information, and intelligence sciences. . . . MIT needed to be as bold at the start of the twenty-first century as our predecessors had been at the start of the twentieth. The time had come to build a facility, the physical form of which signaled the intellectual brashness, energy and excellence held within. The building must display our soul as well as contain it. (Joyce04, Preface, p. xiv)

Europe also has not been standing still. Although the European nations' impact on business practices and global economy may not be as great as the changes coming from China and India, some of the most advanced thinking about business is emerging from Europe. In Chapters 3–5 we will introduce several case studies of European companies.

Chapter 2

Exploiting the 10× Change

This chapter will focus on breakthrough — a fundamental change in an organization's direction — as a response to an abrupt, radical change in the business environment. Andrew Grove of Intel has characterized such environmental changes as "10× change," indicative of an order of magnitude change in one or another factor in the environment.

2.1 The 10× change

In his book *Only the Paranoid Survive* (Grove99), Andrew Grove illustrated great insight about change in our time. He starts by paraphrasing the five forces that Michael Porter (Porter80) said determine the competitive well-being of a business (which we paraphrase still further):

- the strength of the company's current competitors
- the strength of the company's suppliers
- the strength of the company's customers
- the strength of the company's potential competitors
- the possibility the company's product can be built or delivered in a different way

To this list Grove adds a sixth element:

- the company's situation with regard to other companies whose businesses complement the company's business

Grove shows these forces in what he calls a Six Forces Diagram, as shown in Figure 2-1.

The six forces can be sufficient to deal with normal business pressures. However, suppose one of the six forces is suddenly increased by a factor

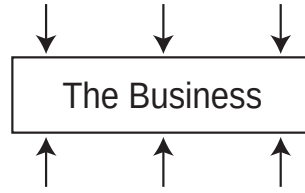


Figure 2-1. Grove's Six Forces Diagram. (Grove99, p. 29.)

of 10, as illustrated in Figure 2-2. For instance, suppose a competitor offers the equivalent of your product at one-tenth the price and perhaps with more capability; this is a 10× change. When a 10× change happens, says Grove, a business gets really hard to manage. You lose control of your business. Eventually the industry will settle down with the new paradigm, and your company may or may not be one of the survivors. Unfortunately, a company often does not or cannot anticipate when a 10× change is about to happen.

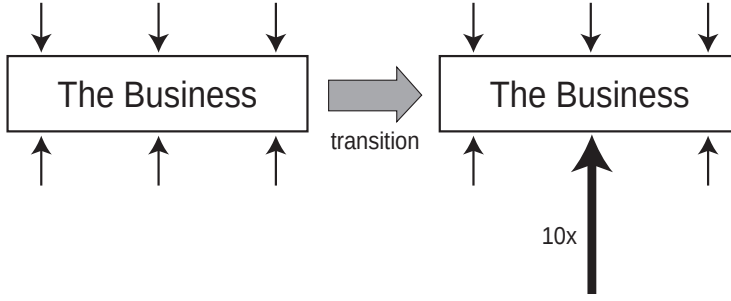


Figure 2-2. A 10× transition. (Grove99, p. 31.)

In his book Grove describes the instance of transition shown in Figure 2-2 as an inflection point in what he called the inflection curve (see Figure 2-3). As we look at Figure 2-3 and reflect on the two major twentieth-century transitions in management practice (the control methods developed in the 1930s and 1940s and the incremental improvement methods developed in the 1970s and 1980s, as described in Section 2.3 below), we understand that a new era has begun — the era of breakthrough.

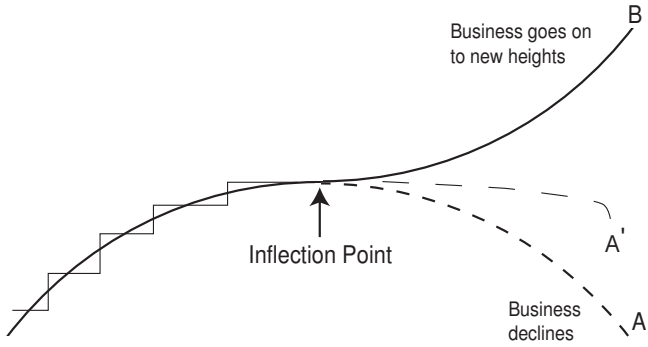


Figure 2-3. The Inflection Curve. (Derived from Grove99, p. 32.)

The breakthrough era, which started in the mid-1990s, was well formulated in Grove's book as being the result of 10× changes. Control and incremental improvement (indicated in Figure 2-3 by the steps) are no longer sufficient in the face of a 10× change; something dramatic has to be done to counteract the decline of the old business in the face of the 10× change. Even if the current business appears to be losing ground very slowly, as shown by curve A′ in the figure, it will likely eventually disappear. To counteract the decline of the existing business, the company needs to fundamentally change its business — to switch from path A or A′ to path B.

There are many reasons why a business may begin to decline and a new business must be sought. Traditionally, of course, products have a life cycle and must be replaced periodically by upgraded products; or markets may become saturated and thus no longer provide the growth opportunity that investors expect. However, a 10× change is bigger or more sudden than those traditional challenges. A 10× change may result from factors such as *(a)* rapid or dramatic price decreases, *(b)* dramatic market changes, or *(c)* societal incidents. Or it may occur because of *(d)* a clear insight or understanding that a value shift has happened, which could be a result of *a*, *b*, or *c*.

An example of *dramatic price decrease* has been seen over the history of the computer industry. The computer industry has seen a series of A-to-B changes: from the mainframe computers oriented primarily to

IT departments; to minicomputers with a different set of customers, including personnel in the process control area; to workstations as desktop computers for engineers; to personal computers eventually being adopted for desktop use by everyone at home or in business; to desktop computers providing information retrieval and some computing power as well as entertainment and means of communication through interactions across the Internet. Each of these changes came about because technology made it possible to provide more powerful computers at dramatically lower prices. Also, arguably, each step in the change of the computer business took advantage of the desire of individual departments or functions of businesses to escape from more centralized control of their computer operations; thus, another component of the continuing change in the computer industry has been a *latent dramatic market change*.

IBM's sale of its personal computer business to the Chinese company Lenovo, as mentioned in Chapter 1, is a result of the continuing dramatic price decreases in the computer industry. IBM is apparently increasingly moving to selling services and was no longer satisfied with the money it could make in the personal computer business. Another example in the price area is the rapid decrease in the retail price of DVD recorders in Japan, which has dropped as shown in Table 2-1.

Table 2-1. DVD recorder price decreases

Year	Price	Decrease
2000	100	
2001	53	47%
2002	37	21%
2003	26	30%
2004	19	23%
2005	15	21%

(Source: *Katu-Koujou* [The Factory Winning in Competition"] by Yasuhiro Goto, published by Nihon Keizai Shinbunsya, 2005.)

An example of *dramatic market change* comes from the experience of a Japanese construction company. The company built industrial plants in the 1970s (as pictured in the top part of Figure 2-4); in the 1980s it shifted to building city skyscrapers (middle part of Figure 2-4) in response

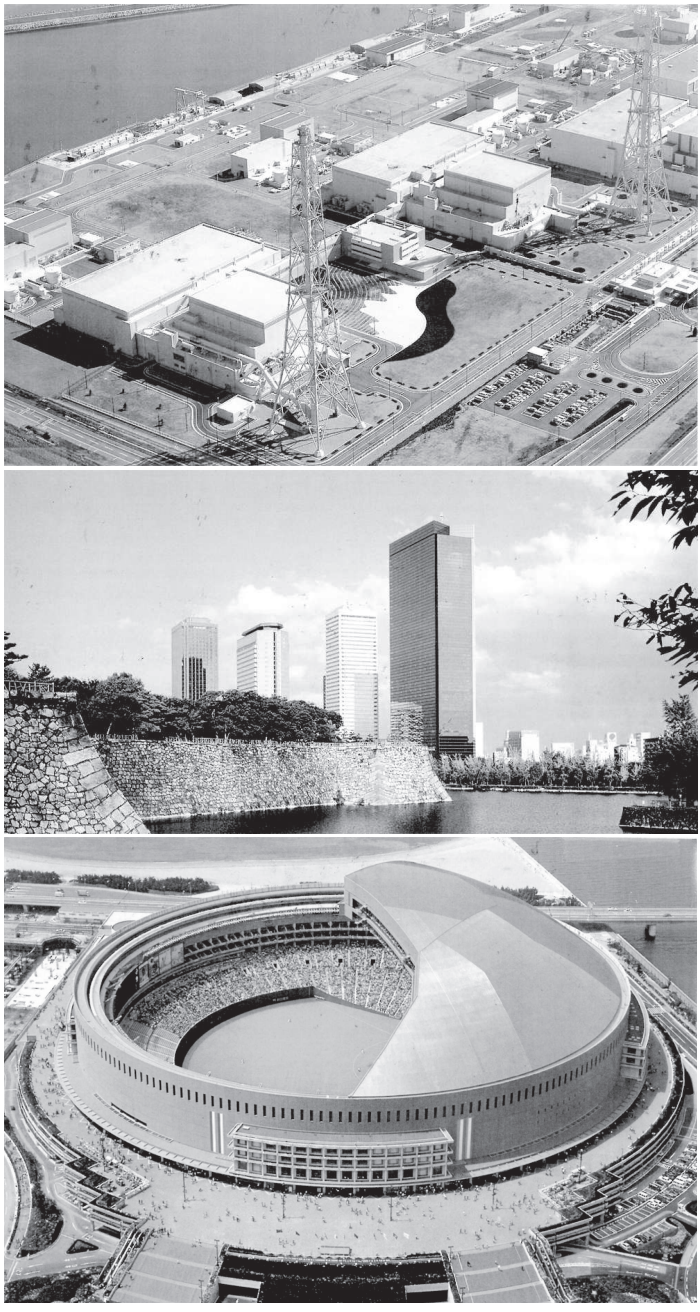


Figure 2-4. A Japanese construction company's changing businesses. Top, industrial plants in the 1970s; middle, skyscrapers in the 1980s; bottom, a stadium in the 1990s.

to market demand; the company then moved in the 1990s to building "leisure structures" such as large stadiums (bottom part of Figure 2-4).

We will study another example of repeated dramatic market changes in the case study of FAVI in Chapter 4; you might glance at Figure 4-1 now.

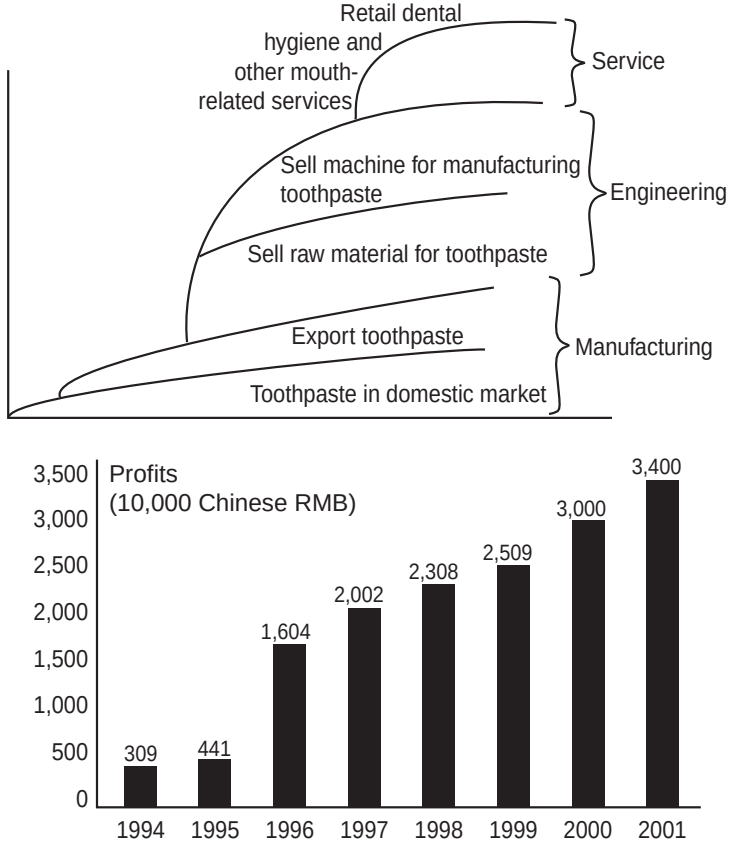


Figure 2-5. Changes at Shanghai Toothpaste Company.

The Shanghai Toothpaste Company provides an example of a company facing a 10× change from a *societal incident*. Many companies in China were privatized as China adopted non-communistic market practices in recent years — and privatization was a 10× change for these traditionally government-owned companies, because they could no longer

expect government support and as much government control of markets. Some survived the change and some did not. The Shanghai Toothpaste Company's original business was manufacturing toothpaste for the domestic market; in time the company developed an the export business as well. Then it encountered the 10× change of privatization and the need for an A-to-B change in the business. As shown in the top part of Figure 2-5, Shanghai Toothpaste moved into the business of selling compounds that went into toothpaste and machines to fill toothpaste tubes and print the labels. It encouraged other, new companies to go into the toothpaste manufacturing and sales business — that is, Shanghai Toothpaste actively created competitors for its original business — and it proceeded to supply these companies. In a sense, Shanghai Toothpaste moved from being only a manufacturing company to being a manufacturing and engineering company. Then, starting in about 2000, the company moved its business again — to providing mouth-related services in chain stores. The company hires dentists and dental hygienists and situates them in retail locations. The top part of the figure is a diagram for illustrative purposes only and does not accurately portray either the time axis or the results axis; the bottom part of the figure shows actual profit figures for the listed period of time.

Perhaps other examples of such A-to-B changes in business will come to mind for readers.

A 10× change, for example a change prompted by societal incidents, can be bigger than an industry or a collection of competitors. For instance, September 11, 2001, caused various 10× changes in the United States (e.g., expansion of anything related to "antiterrorism") and in some other countries. For at least a period of time, the 2003 SARS scare caused a 10× change — China-based elements in many supply chains simply stopped. China's joining the World Trade Organization resulted in a 10× change in management thinking in China, which in turn is engendering a 10× change in the global economy. It is beginning to appear that the European Union's change in currency to the Euro is resulting in a 10× change in European standards and in competitiveness to the dollar.

It also works the other way. For instance, the integrated circuit certainly resulted in various 10× changes, some of which might be called societal incidents. The Internet has had similar effects.

The grid in Figure 2-6 shows our assessments of how companies we describe in this book have addressed sudden market weaknesses caused by the types of 10× change listed on page 21. The horizontal rows of the grid relate to three ways to create a new business, as we'll discuss in section 2.2. Earlier in this section we discussed companies b, c, and d as listed in Figure 2-6.

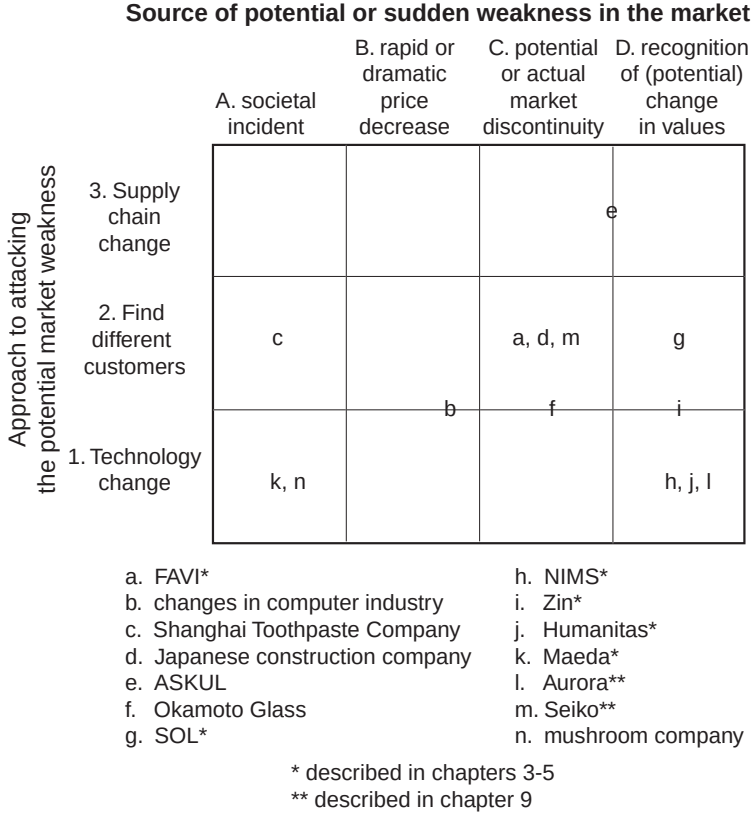


Figure 2-6. Market weaknesses and ways of attack.

2.2 Three ways to create a new business

Typically, creation of a new business happens in one of three ways:

1. technology change
2. finding different customers
3. supply-chain change

In the last section we mentioned several cases of business change that were customer-based — the Japanese construction company, the Shanghai Toothpaste Company, and FAVI.

In the rest of this section, we will give specific examples of companies that made business breakthroughs through changes that were supply-chain driven (ASKUL) and technology driven (Okamoto Glass and a Chinese mushroom company). The changes in the computer industry were also technology based, but in that case no single company was able to make the successive leaps from A to B; it was always a new company that made the A-to-B leap.

Supply-chain-based change

For years the Japanese stationery and office supplies market was monopolized by the large company KOKUYO; a small company promoting new products had little chance of entering the business. In this environment, ASKUL was started to address the desire of its parent company, PLUS, to get a bigger foothold in the market dominated by KOKUYO. From its first sale in 1994, ASKUL grew to be a successful venture by 1999 and has continued growing since.[1]

The essence of the business concept of ASKUL (point e in Figure 2-6) was to change the supply chain in the stationery industry. ASKUL recognized both the fact that the market was ripe for a change and the potential for expanded use of advanced IT technology.

In 1990–92, a "blue sky committee" at PLUS investigated the future direction of a new business, defining the ideal customers and the ideal distribution system. The committee concluded that the new business should not distribute to dealers or retail shows, channels that KOKUYO dominated, but rather should go directly to customers. They also decided

the new business should not target big and medium-sized companies that require the full service traditionally provided by customer service organizations in dealers and large retail shops. Rather, they decided to focus on small companies, which until then had had to buy their office supplies in retail shops.

In 1992, Shoichiro Iwata spun out of PLUS with a two-person team and started the ASKUL venture. Iwata believed that *time* could create new additional value. "ASKUL" means "deliver tomorrow."[2] ASKUL offered next-day delivery of orders made by phone, fax, or the Internet from a 6,000-item catalog. Next-day delivery rate was 99.7 percent, with same-day delivery for orders placed by 11:00 a.m. to locations within Tokyo and Osaka. Forty percent discounts from list price were offered to all customers.

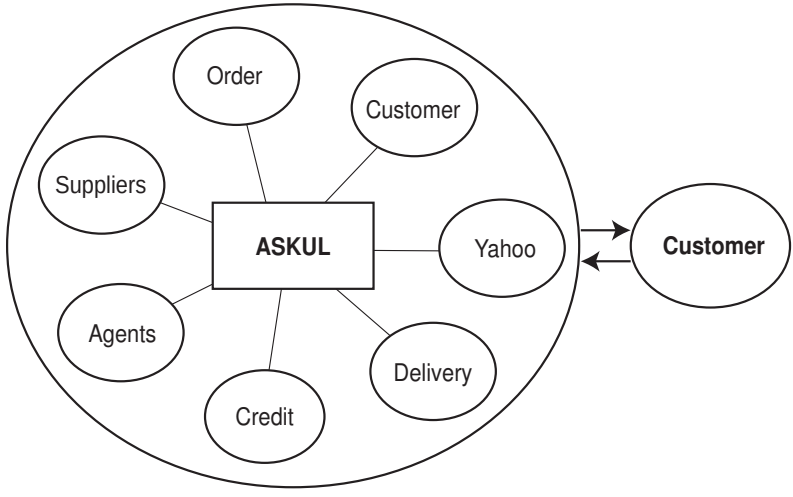


Figure 2-7. The ASKUL "virtual company" model.

As shown in Figure 2-7, ASKUL created a virtual company with a minimal central staff; a majority of the business functions were handled by outsource affiliates, temporary workers, and part-time workers. Reporting to the president of ASKUL were the financial and project innovation departments along with the organizations that handled their key business processes: customer support, efficient customer response, business

planning, and back office. ASKUL employees themselves played one of three roles: they served as staff handling the core daily jobs, as innovators improving the current business, or as entrepreneurs looking five years into the future.

Rather than offering only products made by PLUS, ASKUL concluded that its real business purpose was to deliver all products regardless of manufacturer. Offering a 40 percent discount from list to all their customers drew criticism and resistance from the traditional stationery industry. However, ASKUL refused to compromise — because its business purpose was to create the optimum system from a societal point of view. ASKUL concluded that its job was not to sell office supplies but to create a system for how to sell office supplies. Using information technology, ASKUL made each day's orders immediately visible and undertook daily intensive analysis to enable quick action on new strategies or tactics with items and prices. The company worked jointly on this with suppliers and manufacturers (including those not traditionally part of the office supply industry). Such analysis and collaboration resulted in delivery of food and drink, foot warmers, and other office needs along with office supplies.

ASKUL's initial supply-chain-based attempt to attack the Japanese stationery market was motivated by the parent company's desire to gain a bigger foothold in the market. The blue sky committee that launched the particular mode of attack apparently recognized the possibility of *instigating* a 10× change in the market via changes in the supply chain.

Figure 2-8 shows ASKUL's sales from its inception through 2004. ASKUL has now added a catalog for health care products to sell in addition to its stationery business line, anticipating market saturation in the stationery business, we think. It is trying to make a customer-based change that still utilizes its supply chain innovations.

Technology-based change

Okamoto Glass (point f in Figure 2-6) has stuck with glass-making technology and advances in that technology, but they recognized that such technologies would lead it into different markets.

Okamoto Glass has existed since 1928. Originally its business was

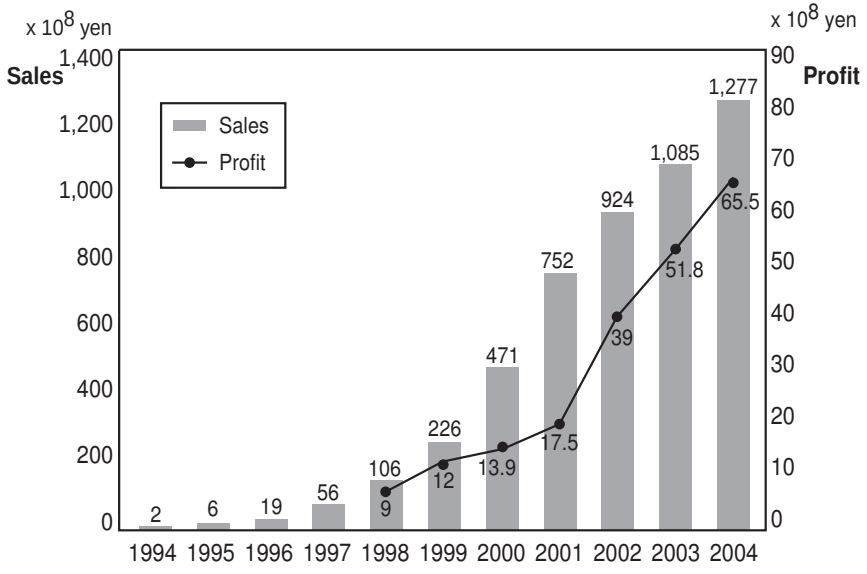


Figure 2-8. ASKUL sales history.

manufacturing cut glass for the consumer market. In 1977 the company moved into industrial glass production. By 1980 the company's industrial glass products included, on the one hand, automobile "hard lenses," airplane windshield glass, and electrical range and microwave door glass; and, on the other hand, special illumination for supermarkets (to make meat look pretty).

The expansion into industrial glass products continued. By 1996, for instance, the company was making reflectors for projectors, in which the glass needs to be durable to withstand high temperatures. This required technology for casting and cutting delicate glass pieces. Also by 1996, the company was making dental light mirrors. One can see how each of these was an extrapolation on the 1980 products.

Behind this dramatic business change was lots of research and development — toward high-function glass, lenses, and filtering of light.

In another technology-based example, the Shanghai Pudong Tiencu Mushroom Co. Ltd. (point n in Figure 2-6) wanted continued business growth, but it was difficult and too expensive to expand the amount

of land they had in the Shanghai region. (Also, in general there are restrictions on people moving in China.) Thus, the company made a break with traditional agricultural methods of growing mushrooms, although this case involves more of a societal constraint than an incident as such. The company now produces 1,000 tons of fresh mushrooms per year using high-tech methods. These methods include bioengineered ways of selecting the seeds for breeding, "intelligent" control of an artificially stimulative environment, and roboticized mechanical work. The company grows mushrooms in an "organic" way, in the sense that it does not use pesticide, chemical fertilizers, or growth hormones. The resulting mushrooms are kept fresh in a vacuum. Using these high-tech approaches, the company keeps growing mushrooms around the year with no off-season. The mushrooms are substantially exported to North America, Europe, Australia, and throughout southeast Asia, even though there is unsatisfied demand in the domestic Chinese market.[3]

2.3 Three eras of change and management

While this book is almost totally about breakthrough management, we must look back briefly and provide some context for breakthrough management in terms of the two paradigms for management that dominated much of the twentieth century: process control and incremental improvement.

The methods of process control were developed in the United States in the 1930s and 1940s and were adopted with revolutionary effect by Japan in the 1950s. Process control, as symbolically indicated by the flat line in the left portion of Figure 2-9, had the goal of synchronizing and minimizing the variation of all of the parts of an industrial process in order to make mass production possible. The methods of process control are now used by sophisticated businesses (and other institutions) throughout the world.

The incremental improvement paradigm was developed in Japan in the 1970s and 1980s. Incremental improvement is symbolically indicated by the staircase graph in the middle portion of Figure 2-9; its goal is incrementally improving businesses' products and services and the processes

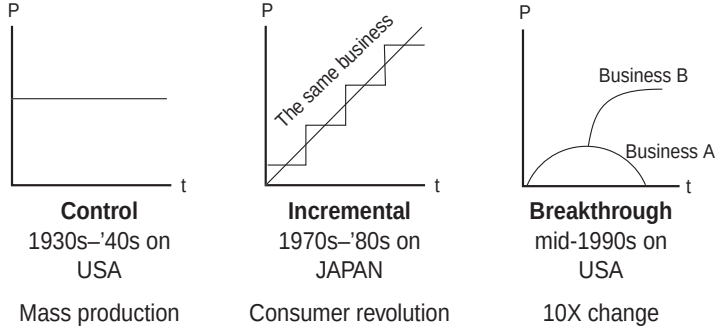


Figure 2-9. Left: process control; middle: incremental improvement; right: breakthrough.

for providing both products and services. As with process control, the methods of incremental improvement (e.g., lean production or six sigma) are now used by sophisticated businesses throughout the world.

The overarching purposes of process control and incremental improvement in their times were the same as the purpose of breakthrough management today — to enable companies to successfully compete and survive. Survival requires making money — at least sufficient money to cover costs, and typically enough money to provide investors with a return on their investment.[4]

However, while process control was sufficient for long-term survival in the 1930s and 1940s, a business in the 1970s and 1980s could not count on long-term survival by focusing only on incremental improvement; incremental improvement was becoming an increasingly necessary condition but was not a sufficient condition. Businesses still needed to maintain their skill at process control, or their products and costs would not be sufficiently reliable to let them stay in business. Examples abound of companies that have gone out of business because of inadequate process control. For instance, Shoji Shiba remembers that between the afternoon of March 1 and the morning of March 2, 1955, a total of 1,936 students at nine elementary schools in Tokyo had serious stomach problems including vomiting from drinking Snow brand milk products. Because Snow had lost control of its manufacturing process on account of an electrical blackout and insufficient maintenance work, products from one of the

company's plants caused food poisoning in the children. As a result, the chief executive had to resign. In another example, the world-renowned Arthur Anderson accounting firm was forced out of business when it became clear that its internal controls on giving conservative accounting advice were inadequate, if not explicitly ignored. You will be able to think up your own additional examples — perhaps close calls within your own business.

The same thing is true in today's breakthrough era in which companies are sometimes forced to seek new businesses, as shown symbolically in the right portion of Figure 2-9. That is, a company can switch businesses, but then the company has to deliver its products or services in a reliable, controlled way if it is going to succeed in getting and keeping customers. Also, probably sooner rather than later, it will likely have to provide incremental improvements to its products and services to remain competitive with other companies that are trying to expand in the same business area.

The connection between making money and survival is illustrated at the right side of Figure 2-10. The figure also illustrates the necessity

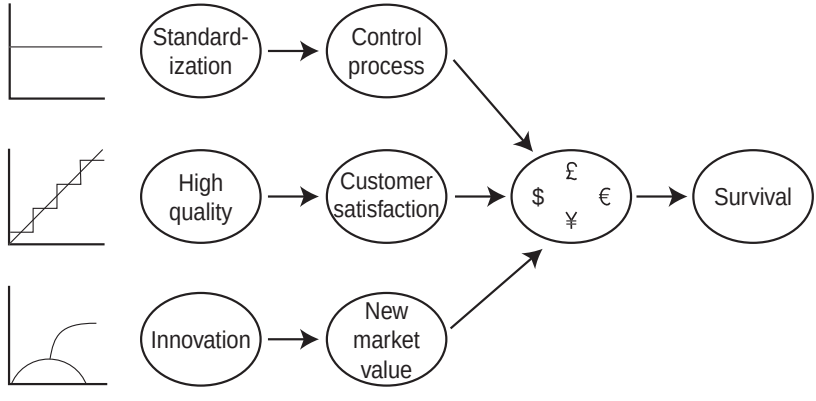


Figure 2-10. Business logic of the three management paradigms.

of having elements of all three paradigms: process control (with its emphasis on standardization), incremental improvement (with its emphasis on continuing customer satisfaction based on ever-improving levels of customer-perceived quality), and breakthrough management (with its

emphasis on attaining new markets through innovation).

The key trick is the relative timing of increased emphasis on each of the three elements shown in the figure. The importance of the three concepts of management has changed over the years as the *clock speed* of various industries has changed. Clock speed is the rate at which aspects of an industry change. Charles Fine's book on the subject (Fine98) discusses three types of clock speed (product technology clock speed, organization clock speed, and process technology clock speed) and gives examples from various industries.

Twenty or 30 years ago, many leading industries had clock speeds mostly measured in decades or perhaps in terms of a hundred years or more; such industries included aircraft, tobacco, steel, ship building, petrochemicals, paper, electricity, and diamond mining. Leading industries with product clock speeds mostly ranging from 4 to 8 years and organization and process clock speeds ranging from 5 to 25 years included the bicycle, automobile, computer operating system, agriculture, fast food, beer brewing, and airline industries.

Today, in contrast, a number of leading industries have product clock speeds mostly under a year (and no more than 1 to 3 years) and organization and process clock speeds of a few years to at most 10 to 20 years.

Thus, many years ago it was sufficient to introduce a technology and then do control management for many years. A little more recently, say as recently as the mid-1980s, a company could introduce a new technology, do control management, and then add management of incremental improvement to remain competitive, as shown in the top part of Figure 2-11. A firm could alternate back and forth between incremental improvement and control for years until eventually it needed to make a new breakthrough to stay in business.

Today, management often must be done in a new way. A business starts with a breakthrough, as shown in the bottom part of Figure 2-11, producing the new product exactly as developed and getting it under control. From there one improves the product using the methods of incremental improvement, getting each change under control; but, surprisingly soon, it becomes necessary to jump to the next breakthrough. In other words, faster clock speed in an industry means that breakthrough

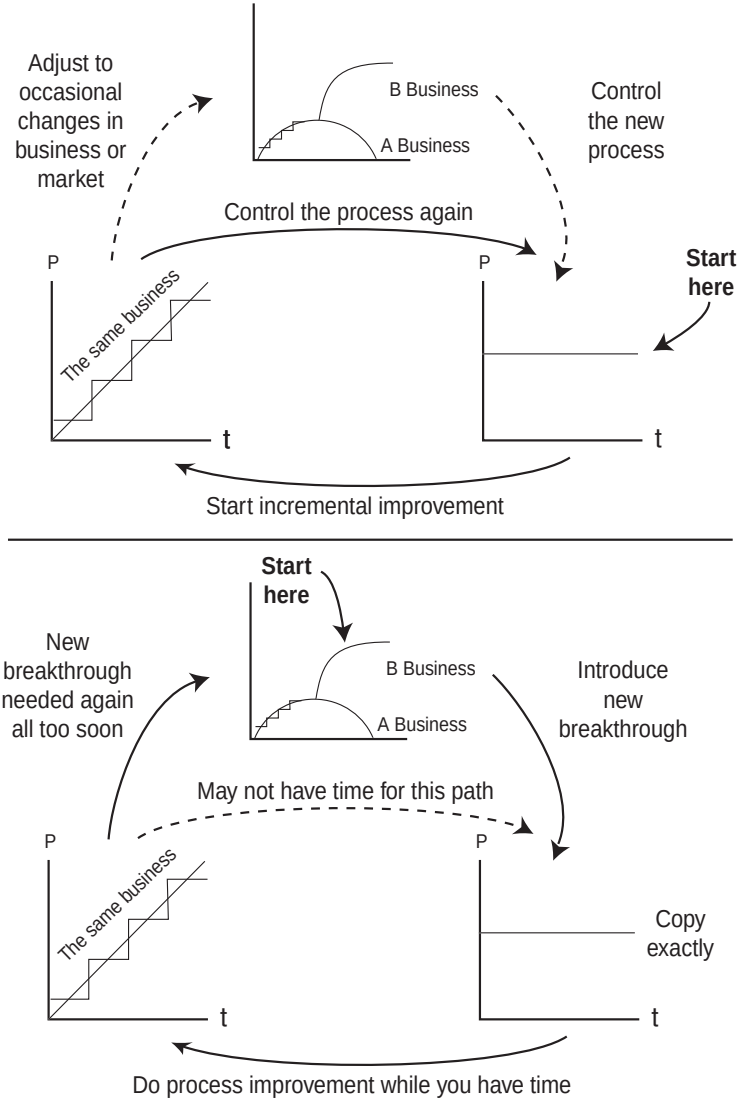


Figure 2-11. Change in the frequency of the need for breakthrough management.

is required more often.

Before we move on, we'd like to summarize and compare the characteristics of the three types of management using the chart in Figure 2-12.

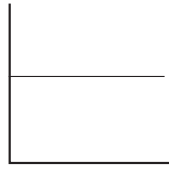
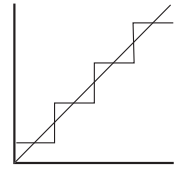
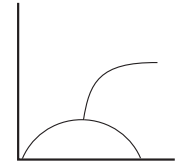
	Control	Incremental	Break Through
			
Business logic	Control process	Customer satisfaction	New market value
Changing Unchanging	Process Standards	Standards Business	Business Values
Hypothesis of human nature	Theory **X**	Theory **Y**	Theory **Z**
Key player	Middle manager	Shop floor workers	Top managers
Management focus	Discipline focus	Backward focus	Forward focus
Data	Numeric	Numeric and language	Language and image
Tools	Statistical analysis	Kaizen methods	Chapters 6–7 methods

Figure 2-12. Comparison of the three paradigms of management.

The top row of the chart symbolized the "logic" of the three approaches to management, as shown in Figure 2-9 and listed in the next row of the chart. In all three cases, making money is required for survival. In the control management paradigm, making money requires a firm to control processes, and to do that the firm must have standardization. In the paradigm for managing incremental improvement, making money requires customer satisfaction, which in turn requires a culture and systems for quality. In the paradigm for management of breakthrough, making money requires that the firm bring some new value to the market, which in turn requires innovation in some dimension of the business.

The next row of Figure 2-12 shows what is changing and unchanging in the different management approaches. In control management, the standards (i.e., characteristics of the product or service) may be unchanging, while the process for achieving the standards changes to improve. In incremental improvement management, the business is more or less unchanging, while the standards themselves change.

In breakthrough management, a company's core "values" are unchanging even though the type of business may change. This pattern can be seen with the various businesses we described earlier in this chapter. In each case the underlying company value was unchanged. The toothpaste company always did something related to the mouth as it repeatedly augmented the form of its business. Okamoto Glass always dealt with glass, even though it dramatically changed its glass-making technology and areas of application. The Shanghai Pudong Tiencu Mushroom Co. kept growing mushrooms even as its "farming" methods changed and markets expanded. ASKUL always continued to address daily distribution of a commodity product as it went through its various business evolutions. The FAVI company we will describe in Chapter 4 always stays focused on die casting even as it finds different areas of business (see Figure 4-1).

One can imagine how too big a jump to a new business could result in a situation so different that the ability to solve problems and come up with new ideas would be decreased. For instance, one Japanese steel company started a fish cultivation business in order to utilize hot water that was a by-product of the steel manufacturing process; but fish cultivation was too far from the original steel business, and the project failed. When

faced with 10× change, a company foreseeing that it has to make an A-to-B jump will do well to think about the question, "What is our core, unchanging value?"

The fourth row of Figure 2-12 lists theories of human nature and management. Theories X and Y were described by Douglas McGregor (McGregor85). Theory X says that people want to have stability and want to be led. This theory suggests the power of standardization and control of workers in the pursuit of mass production. Theory Y says people seek self-determination and innovation. This model suggests the accrual of knowledge, continuous improvement, and worker development and empowerment in pursuit of creating something new. Theory Z is what Shoji Shiba calls his idea that in the quest for breakthrough we must move beyond rational thinking in some circumstances (see page 206).

The fifth row of the figure shows who is important in the three types of management. Historically, leaders of organizations delegated control management to middle managers, and this was appropriate. Continuous improvement activities must be substantially focused among the workers themselves — that is where the information needed for improvement exists, not at the top levels of the organization. However, management of breakthrough necessitates great attention on the part of leaders of organizations; no one but the leader can change the business. Thus, breakthrough management is a key skill for top managers; in a different paradigm than for either control management or incremental improvement management, the top manager must build an appropriate system to accomplish breakthrough. Also, the leader is the most logical person to have the forward view called for in the next row of the figure.

The seventh row of the chart indicates the types of data that are most relevant to the different types of management, and the final row indicates the types of tools most relevant for scientific analysis of the various types of data. While breakthrough management is a relatively new skill, it is not without tools, and we describe relevant tools for breakthrough analysis in Chapters 6 and 7.

We conclude this section by connecting the three types of management to a memorable visual image. In paintings relating to Buddhism, three eyes are sometimes shown. These are the eye of the past, the eye of

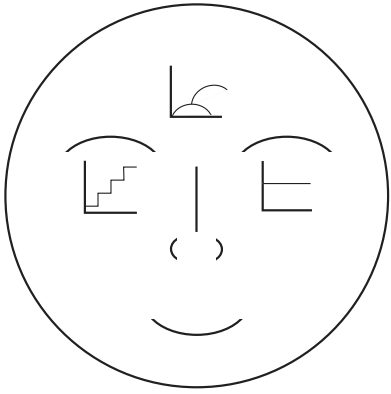


Figure 2-13. An adaptation of a Buddhist motif: eyes of the past (right), present (left), and future (top middle).

the present, and the eye of wisdom. The three types of management, which today's CEOs must simultaneously be concerned with, can be illustrated as the three eyes in Buddhism, as shown in Figure 2-13. That is, the CEO needs an eye to monitor management for control, or else the company will not meet the minimum contract between the company and society. The CEO needs an eye to monitor management for incremental improvement, or else the company will not keep up with changing customer requirements. And the CEO needs the wisdom to see the path to future breakthrough, or else the company will have no tomorrow.

2.4 The rest of this book

In the introductory paragraphs of Chapter 1, we raised the question of how to survive in the face of worldwide competition (particularly from Asia) in producing commodity products. We see three basic approaches to survival:

1. Relocation — for example, outsource to China or India
2. Continually evolving what Noriaki Kano called "attractive" product characteristics[5] — engaging in constant product development to regularly find new latent customer requirements and bring out new versions of the product

3. Moving beyond commodity products — changing your game by completely shifting to a new business area

Variations on the relocation approach could include contracting out activities (traditional outsourcing), entering into joint ventures with companies in other countries, and outright sale of a business to a company in another country (as when IBM sold its personal computer business to Lenovo in China). We don't know much about the strategy and tactics of the relocation approach; readers will have to find someone else's book to learn about this approach.

Continually evolving attractive product characteristics was the subject of our previous books, *A New American TQM* and *Four Practical Revolutions in Management* (Shiba94, Shiba01). It also is a strategy we shall encounter in some cases in this book.

Breakthrough to a completely new business area, however, is the central focus of this book.

The structure of the rest of this book is based on the various perspectives of breakthrough shown in Figure 2-14. These perspectives come from Shoji Shiba's study of many cases of breakthrough — both successful and unsuccessful — in the United States, Japan, and Europe.

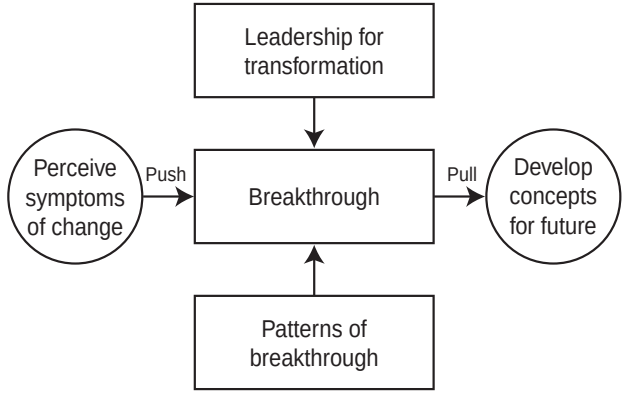


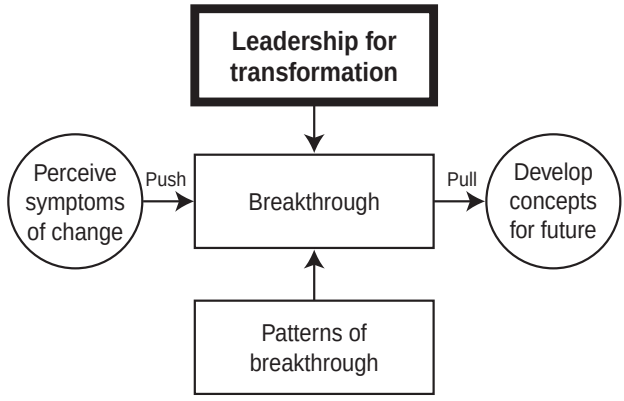
Figure 2-14. Perspectives on breakthrough.

The four elements for successful breakthrough are classified in two dimensions.

The elements in the vertical dimension, *leadership for transformation* and *patterns of breakthrough*, relate to organizational issues — how to change the organization. In Chapters 3–5 we discuss leadership for transformation. In Chapters 8–10 we discuss patterns of breakthrough.

The horizontal dimension elements, *perceive symptoms of change* and *develop concepts for future*, relate to individuals and have to do with giving individuals new skills. We discuss ways to foster these skills in Chapters 6–7.

Part II: Leadership for Transformation



Many businesses have leaders, but only some leaders are naturally, or are compelled by circumstances to be, concerned with transformation. Transformation requires vision that is not required of or does not come naturally to many more traditional leaders. Thus, we call leaders of transformation "visionary leaders."

The visionary leader must work, more or less successively, in three major areas of effort, as shown in Figure II.

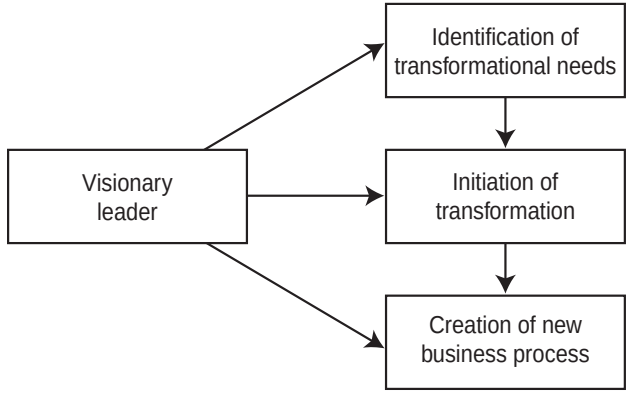


Figure II. Work of the visionary leader.

In the three chapters of Part II we will discuss the work of the visionary leader by drawing on several case studies from real companies and institutions. From these case studies, and from others we have observed, we have distilled eight principles of visionary leadership — eight patterns

of behavior or action that we have generally witnessed in the leaders in the cases we have studied. The eight principles are listed in Table II.

Principles 1 and 2 are introduced in Chapter 3, Identify Need. Principles 3–5 are introduced in Chapter 4, Initiate Transformation. Principles 6–8 are introduced in Chapter 5, Build New Business. (At the end of Chapter 1, we noted that some of the most "advanced" ways of thinking about business are coming to the fore in Europe. Chapters 3–5 include case studies from four European businesses.)

While each case study focuses on a particular subset of the eight principles, Tables 5-1 through 5-6 on pages 123 to 128 summarize the applica-

Table II. Eight principles of visionary leadership

Principle 1. The visionary leader must do on-site observation leading to *personal perception* of changes in *societal values* from an *outsider's point of view*.

Principle 2. Even though there is resistance, the visionary leader *never gives up*; the leader squeezes the resistance between *outside-in* pressure and top-down inside instruction.

Principle 3. Transformation is begun with *symbolic disruption* of old or traditional systems through *top-down* efforts to *create chaos* within the organization.

Principle 4. The direction of transformation is demonstrated by a symbolic *visible image* and by the visionary leader's *symbolic behavior*.

Principle 5. The quick establishment of new *physical*, *organizational*, and *behavioral systems* is essential for successful transformation.

Principle 6. *Real change leaders* are necessary to enable transformation.

Principle 7. The leader creates an *innovative* system to provide *feedback from results*.

Principle 8. The leader creates a daily operation system that includes a new *work structure*, a new approach to *human capabilities*, and *improvement activities*.

tion of all eight principles in each case study. Naturally, there is overlap among the applications of the principles in the various case studies; and inevitably, some cases do not provide clear, strong examples of some of the principles.

Chapter 3

Identify Need

This chapter addresses the first task shown in Figure 11 on page 44 — identification of the transformational needs. There are two aspects of this: (1) identifying the need for transformation, and (2) identifying what transformation is needed. This is a process of discovering what is unknown or invisible and turning it into a commitment for tangible change in a visible direction.

3.1 Humanitas and principle 1

Principle 1. The visionary leader must do on-site observation leading to *personal perception* of changes in *societal values* from an *outsider's point of view*.

Three components of this principle are highlighted in italics. First, the visionary leader needs to see things from the point of view of an outsider. Second, the visionary leader needs to do on-site (by which we mean firsthand) observation that leads to a personal perception. Third, as an outsider, looking at things firsthand, the visionary leader has the best chance to sense a change in societal values that can lead to new opportunities.

Hans Becker and his work at Humanitas provide a good example of this principle. The Humanitas Foundation is a nonprofit organization in the Netherlands that provides housing and home care for elderly people. More than 6,000 elderly people live in Humanitas apartments, and the organization employs about 2,100 people. It also utilizes 900 volunteers. It is one of the largest institutions in this field in the Netherlands.

In October 21, 2005, Shoji Shiba and Bertrand Jouslin de Noray, Secretary General of the European Organization for Quality (www.eoq.org), visited Humanitas in the Rotterdam region and met with CEO Hans Becker, among other people.[1] Before we look more closely at Humanitas, however, let's consider elder care in the past and as it is today.

Historical perspective on elder care

In past centuries old people in the Western world typically remained living with their extended families, often still in their lifelong homes. Members of their extended families took care of the elders when they no longer could take care of themselves, and the elders were at least theoretically respected and looked on as a source of wisdom. There was not very much that medical science could do for aging and sick people, and general practitioner doctors made house calls; so staying at home through a person's final decline made sense.

In more recent times, people have lived to older ages, medical practice has gotten more sophisticated, doctors stopped making house calls, and families in many Western societies often have become geographically separated. These trends have resulted in the development of special facilities to take care of elderly people who need rehabilitation after hospitalization or who can no longer live by themselves at home. These "nursing homes" look like and run like something closer to hospitals than homes, often with two, four, or six residents to a room and with only thin curtains providing visual (but no audio) privacy. Few people want to live in such nursing homes. Most people's ideal is to continue living at home as they grow old.[2]

More recently (at least in the United States), assisted living facilities developed: complexes that aim to provide a more homey feeling. These facilities typically offer small apartments that can be furnished with a few of the resident's own household items (bed, dresser, chairs, TV, etc.), and facility staff members provide assistance with routine tasks such as clothes washing, food preparation, room cleaning, and reminders to take medicines. Sometimes assisted living facilities are located on the same campus with *(a)* independent living apartments for recent retirees

(typically in a separate building or at least in a separate wing), and/or *(b)* skilled nursing facilities for those who are too disabled to remain in assisted living. Such institutions' marketing brochures describe a smooth transition from independent living to assisted living to skilled nursing.

Such assisted living facilities have their own problems, however. Too often they, too, feel quite institutional rather than homelike. After all, all residents are elderly and many are frail. And these facilities run like institutions, with meals at certain times, artificial recreational activities such as bingo and group crafts, and lots of rules and standards. In particular (again, at least in the United States), they are subject to many government health care regulations as well as business positioning and staff certification constraints such that an assisted living resident can be evicted at some point and forced into a nursing home because of an ailment or lack of capability that might not inherently prevent the resident from being cared for in the assisted living facility.

Thus, in effect, elderly people who decide (or whose families decide) that they should give up their homes and move to a retirement community tend to lose control of their lives sooner than they expect. As they grow infirm, they are told they must leave the multiroom independent living apartments that were a somewhat attractive alternative to their own home and move to a separate assisted living facility. In so doing, they again incur much of the emotional pain of giving up friendly neighbors and another significant portion of their belongings. They typically move to a one-room (or studio) apartment, and often are second-class citizens when it comes to food service (which may be an adjunct to the food service provided to the independent living residents). Then, once they have adjusted to their new home and fellow residents in assisted living, they may be told that they no longer qualify for assisted living and have 30 days to leave and find a skilled nursing facility somewhere. But in the United States, Medicare will only pay two-person rooms in skilled nursing facilities (not for a private room); labor economics inevitably prevent staffing at a level sufficient to allow desirable individualized care for all patients; and health care regulations (e.g., a rule that railings on beds must be up to prevent a person from falling out of bed) can almost imprison the patient. Thus, after three home changes (in perhaps as

many years), the elderly person ends up in a completely unhomelike setting where he or she may reside until death. There are no provisions for patients' spouses to live with them in nursing homes. It's no wonder that as you walk down the halls of a typical skilled nursing facility, you not infrequently hear a patient plaintively and endlessly calling, "Help, help. . . . " Curiously, the less homelike and more oppressive the facility becomes, the more expensive it also becomes.

Evolution of Humanitas

In the years before 1990, the facilities of Humanitas were like those of many other elder care facilities in the Netherlands. The health care professionals ran the show and focused narrowly on the physical health of the patients rather than on their overall well-being and happiness. Six to eight people lived together in each large room. There was a "do this, do that" culture with lots of standard procedures. Everyone ate meals at the same times, everyone had the same kind of cleaning, and so forth.

Today, however, Humanitas has implemented a revolutionary approach for the living arrangements for elderly people. The new concept is based on four ideas (Marrewijk04):

- ageproof residential complexes
- support for self-determination and self-reliance among clients (as Humanitas calls them, as opposed to "patients")
- extended family concept
- support for fun through positive attitude, surroundings, and atmosphere

These ideas are aimed at moving Humanitas from a culture focusing fairly exclusively on health care (in an institutional setting) to a culture that has a less institutional feel and focuses on not only care, but also attractive housing and the overall well-being of the residents.

Ageproof residential complexes. By 2004 Humanitas had demolished 5 old residence buildings and built 10 new residential complexes. The new facilities look more like modern hotels than old-age residences (see top right and bottom left photos of Figure 3-1). The apartments in each residential complex are pleasant and adequately roomy — a minimum

Figure 3-1. Hans Becker (top left); a Humanitas Foundation facility (top right); an interior atrium (bottom left); interior artwork (bottom right).

of 70 square meters (which is a little over 750 square feet), with larger units available for more wealthy people. A resident can rent or buy. A person or couple over 55 years of age can move to a Humanitas facility while they are still in relatively good health and make it their "residence for life." Humanitas manages the residency of each complex to maintain a desired balance between residents who require no care, those who need some care, and those who need full care.

These complexes are like little villages (like many modern hotels); they contain restaurants, supermarkets, hairdressers and beauty salons and other types of shops, Internet cafes with computer classes, bars where a person can buy drinks, baby and child care facilities open to outsiders, laundries, gyms, and so on (see Figures 3-1 and 3-2).

Apartments are designed to accommodate residents if they grow less able (e.g., they offer "handicapped" accessibility, "help" call buttons, central monitoring in case a resident forgets to turn things off after cooking, etc.). The able residents and the less able residents can be and are mixed throughout a complex.

With such attractive "residence for life" facilities, Humanitas apartments are in strong demand; in 2004 there was a 12,000-person and minimum six-month waiting list. People choose to make these apartments their permanent homes earlier rather than later — that is, rather than holding out in a long-time home until the last possible moment and then having to go to a skilled nursing facility. As a resident grows older and perhaps less able, the resident stays in the same apartment, and any needed health care and housework is provided on an à la carte basis without requiring the resident to move. There are (slightly hidden) physical, occupational, and speech therapy as well as dentists, doctors, and nursing facilities within the complex. Even residents that come to suffer from dementia are more likely to be able to stay in their "residence for life" apartments if the apartments have become their accustomed homes before they begin to suffer from dementia. As hospitals in the Netherlands increasingly specialize in providing intensive treatment, Humanitas is already beginning to provide real hospital functions for residents with diabetes, asthma, fractures, hernias, cerebral hemorrhages, kidney disorders, eye or ear disorders, heart conditions, and stomach and intestinal complaints.[3]

Figure 3-2. Typical Humanitas beauty shop, grocery store, restaurant, and computer class for children and adults.

In summary, in an effort to avoid making older people move from home to unpleasant living facilities, Humanitas seeks to provide appealing settings that can become and remains a person's home for the rest of the person's life.

Support for self-determination and self-reliance among clients. Traditional assisted living and nursing homes have some rules and policies (undoubtedly substantially for reasons of liability protection or to comply with government regulations) that encourage residents to become more dependent. In contrast, Humanitas has the slogan "use it or lose it." Humanitas's policy is to encourage the maximum possible self-reliance and self-determination on the part of the residents. When residents take more care of themselves or of each other, sometimes with the aid of family members, up to the "pain threshold," it helps them maintain a sense of independence (physical and otherwise) and in practice postpones increasing levels of dependence. This brings greater happiness to the residents and significant economic benefits to Humanitas; Humanitas doesn't have to do what a resident or the resident's spouse can do. All this may seem a bit exploitive on first examination (a 100-year-old woman at one Humanitas complex cooks and makes her bed every day), until we think about older people in the world at large and how they struggle to remain independent and living in their homes and perhaps help other elderly neighbors when they can barely do things for themselves. Younger people often talk about what "is best" for elderly people (i.e., to be safe from injury and not to be a worry to the young people), but often the older people don't want this kind of "safety" themselves.

Extended family concept. Elderly, sick people are not allowed to be isolated in Humanitas facilities. All sorts of people live together in a "neighborhood." The apartments of "sick and healthy people, old and young, poor and rich, immigrant and Dutch" are all mixed together. And Humanitas encourages volunteer work among their residents.

The Humanitas complex health care facilities are open to residents from the outside neighborhood, as are the shops and community gathering spaces of a Humanitas complex. In particular, each Humanitas complex includes a good restaurant to attract people from the surrounding city to meet and talk. Shoji Shiba visited one restaurant for lunch,

and it was a wonderful place to eat. Humanitas advertises and promotes these restaurants.

Such openness to the outside world provides some economic benefit to Humanitas. More importantly, events such as musical performances, bridge tournaments, and food festivals provide greater richness to the internal and external communities and make them stakeholders in each other. In other words, the Humanitas residents are an integral part of a large community, just as a person is who lives in his or her own home. Residents, families, staff, volunteers, and neighbors in the surrounding town all increasingly see the Humanitas complex as just another part of town life. Having normal city retail establishments within the complex also undoubtedly leads to more visits from family and friends of residents. Visiting someone in an isolated assisted living or skilled nursing facility can require a special trip which might happen infrequently; visiting someone in a Humanitas complex can be piggy-backed onto normal daily activities such as shopping or getting a haircut, and thus may happen more frequently.

The extended family idea (along with ageproof apartments and self-reliance) works to avoid a patient-undergoing-medical-treatment mentality at Humanitas. Old-style nursing and assisted living facilities tend to create patient–caregiver relationships. Humanitas transforms the traditional concept to one in which nurses, nurses aides, personal care assistants, actual family members, and volunteers all belong to the "family" of the resident. Humanitas is trying to create new type of social link.

Support for fun through positive attitude, surroundings, and atmosphere. Much of what was discussed under the preceding three headings also relates to this concept. We will get into this concept of fun more deeply (though still somewhat implicitly) as we now turn to Hans Becker.

Hans Becker

Hans Becker, PhD, is the visionary leader of Humanitas (see Figure 3-1). When Dr. Becker was recruited to become the general manager of Humanitas in about 1992, his impression of residences for the elderly was that they were "misery islands" (as his elderly father called them) or "bureaucratic horrors" (in the words of the controversial Dutch politi-

cian Pim Fortuyn). Humanitas was no exception to the "misery island" characterization. However, Becker found that

> Humanitas had formulated their goals as follows: "The foundation provides services to those in need, to whom the freedom to act in accordance with their own beliefs and convictions is guaranteed, and based on the integrity of the human being, who is being held responsible to himself and to his fellow human beings." This official Humanitas statement formulated in 1969 (!) offered many opportunities for improvement. So Becker joined Humanitas and started the transformation process. (Marrewijk04)

The beginning of Hans Becker's journey at Humanitas closely matched our principle 1 (page 47). Becker had an outsider's view of Humanitas — he was headhunted into joining the organization. He knew what faced most people who were not wealthy as they grew old; he had observed the current elder care system "on-site" via his own middle-class background and his elderly father's perspective. He may have sensed (or perhaps had thought explicitly as a university graduate in the history of economics) that the time was ripe for a demonstration of change in societal values regarding elder care.

One of the facility directors Shoji Shiba talked to said that she had been with the organization for 25 years, and that nothing had changed before Becker arrived. Becker's attitude and approach were new. He stated that elderly people were not ill. Rather, they needed help; in particular, they needed happiness. Nutritious food and good cleanliness was not enough for happiness. A lively atmosphere — including noise, smell, and mess or even chaos — was necessary. A rump chop might be much more helpful than medical care. Becker believes that when people have something interesting or special to think about, they do not feel old and do not remember that they are ill. He asserted that Humanitas's job was to protect senior people from the "medical mafia" — those who primarily think of care in terms of good application of the medical code. Becker instituted a no-white-jackets culture. Also, humans need to be bosses of their own lives; but traditional elder care practice says, "We can provide dinner only at 5:00 p.m., and we can provide only the same coffee."[4]

Becker asserted that in facilities that put four people in a room and run primarily on the basis of enforcing medical codes, family members will not visit long and will remember mostly the smell of urine. Becker believes it is important to talk about things other than being old and ill. At Humanitas there are many paintings on the walls of the building (see top left and bottom right photos in Figure 3-1). In Becker's view these artworks need not be beautiful as long as they trigger interesting conversation.

Hans Becker made many other changes. He immediately stopped the work of outside consultants such as McKinsey & Company (apparently, the consultants were providing marketing and strategic direction help). He moved to pull down an old building and began building innovative buildings such as we have described. He got rid of most meetings, which he thinks are a waste of time in 90 percent of cases and tend to be overly theoretical; Becker prefers enthusiastic individual initiative and actual experimenting, which often will give immediate good results. According to Becker, a meeting is needed only 10 percent of the time.

Becker initiated what Humanitas calls the "yes-culture." In responding to any given idea, suggestion, or request from a resident or other stakeholder in the institution, Humanitas staff members are supposed to assume the answer is yes rather than checking why it might not be possible. Of course, in some few instances, the answer will have to be no, but yes should be the default response. Becker says that 90 percent of the time the answer can be yes, but that it is easier for people to start by assuming, and saying, no. For instance, suppose a resident wants to have five cats in an apartment, or suppose a resident wants to have a prostitute (not illegal in the Netherlands) come to his apartment; if the request is for something that a person could have in his or her own home, why not in an apartment in Humanitas? In general, incidentally, Humanitas seems accepting of reasonable pets, and Becker's five-year plan (discussed below) includes encouraging more animals.

Becker believes the yes-culture enhances creativity, although it sometimes does create chaos. Even chaos can sometimes lead to benefits, however. For example, some residents wanted to have a circus come into a Humanitas building, and the answer was yes. But an elephant came

with the circus, and the building staff was worried about the weight of the elephant and the floor. Still, all of the residents talked about this event for a long time. A potentially negative situation was converted to positive talk and memories.

Most of the Humanitas staff were initially against Becker's changes. Twenty or 30 percent of the medical staff left the organization. There were also big risks in the first several years. Becker pulled down an existing building in contravention to some Rotterdam city planning policies. The restaurant lost money in the first year. There was conflict with Holland's social security system. Even now, years later, Becker says Humanitas puts 10 percent of its efforts into controls required by governmental regulations. It was three years before Becker could begin to justify his actions with good results.

In his leadership of Humanitas's continuing transformation, Becker's job is to continually emphasize the desired direction of change. Becker does this both through talk and action. He and others on the management team keep the Humanitas story down to earth and vibrant and tell it often: He talks of "feeding five cats," and says that "a rump chop is much better than medical treatment," "it is good to enjoy wine if you want," and "a beer a day keeps the doctor away." Becker also gets personally involved with resident issues; during Shoji Shiba's visit, Becker repeatedly interrupted whatever he was doing to deal with residents' personal problems.

In addition to telling and acting out the Humanitas story within the organization, Becker also uses outside-in communication. A number of years ago, for instance, Becker broke his leg and was hospitalized in a Humanitas apartment. A journalist visited him while he was in bed. Becker told the journalist of his complaints as a client of Humanitas: All he could see from his bed was the ceiling, the ceiling was dirty, his choice of food was very limited, and he couldn't decide on his own preference for food, and the wine was not cold enough. These complaints were reported publicly. While in bed Becker talked to 200 different people. Becker is popular in the health care world in the Netherlands and thus often appears on TV on a Humanitas-owned channel and other channels.

The Humanitas yes-culture and its embracing of individual initiative includes no daily systematic feedback system. Rather, it depends on

dealing with "moments of truth" (opportunities to satisfy or dissatisfy a customer, as coined by Jan Carlzon, onetime CEO of the Scandinavian Airlines System). At any time residents can give suggestions and complaints to building directors and to Becker. Becker says that old people often do complain, but that it is important to find the causes behind the complaints: The complaint about bland food may well be accurate. Once a year the director of a building complex meets formally with a group of residents.

Becker showed his five-year plan for Humanitas to Shoji Shiba. In Shiba's analysis, the plan addresses five general areas:

- Daily operations: Increase the number animals, add a fitness club, make the restaurants more competitive, and add attractive new features to the complexes such as a swimming pool and museum.
- Challenges of new social problems: Study how to provide care for Alzheimer clients, care for young disabled people, and hospice care for young people.
- Investigation of the future value of the organization: Promote integration of norms and values; explore evolving issues relating to human life.
- Web technology: Investigate e-health, telemedicine.
- Employee issues: Strengthen the social security system for employees.

Becker always looks outside Humanitas for information relating to the future vision of Humanitas.

3.2 ZIN and principle 2

Principle 2. Even though there is resistance, the visionary leader *never gives up*; the leader squeezes the resistance between *outside-in* pressure and top-down inside instruction.

Whenever someone tries to do something new in a company, there is always resistance. Employees don't like change, suppliers don't like change, customers don't like change, and observers are doubtful about change. In general, people don't like, don't believe in, or can't see the benefit of

change. How often has a new idea been called the proponent's "folly"? Thus, a leader who sees the need to transform a business or an institution must have enormous determination and must never succumb to the temptation to give up; otherwise the leader will surely fail.

We saw the never-give-up principle in the Humanitas case study of the previous section. Hans Becker was headhunted in particular for his strong commitment, based partly on his father's viewpoint about "misery islands." In the first year the restaurant lost money, and there was strong resistance from the staff, particularly the doctors; but Becker persevered, including taking such drastic actions as knocking down a building.

In the case study of Maeda in Chapter 5, we will also see an excellent example of the never-give-up principle. Dr. Maeda, the CEO of the Maeda Corporation, had an idea for a new type of cement mixer inspired by his hobby of making Japanese noodles. Such an idea may sound silly on the face of it; additionally, Dr. Maeda is not an engineer by training, and his expert engineers were completely dismissive of his ideas. Nonetheless, as you will read in the case study, Dr. Maeda persevered.

Historic mission of mercy

Now let's look at the case study of ZIN, an institution that Shoji Shiba visited with Bertrand Jouslin de Noray, general secretary of the European Organization for Quality (EOQ), on October 20, 2005. ZIN has a significantly spiritual mission — to provide mercy. ZIN's visionary leader, Wim Verschuren, needed determination, repeated efforts at redirection and rebuilding, and a never-give-up attitude on a for-the-ages scale.[5]

The story of ZIN started in the sixteenth century, when an anonymous artist known as the Master of Alkmaar painted seven panels for the main church of Alkmaar depicting seven works of mercy. (Today this art work is in the Rijksmuseum in Amsterdam.) This church ornamentation was related to a larger movement of mercy that arose in the sixteenth century in reaction to poverty and war and in keeping with Matthew 25, verses 34–36 in the Bible:[6]

> Then the King will say to those at his right hand, "Come, O blessed of my Father, inherit the kingdom prepared for you from the foundation of the world; for I was hungry and you gave me food, I was thirsty

> and you gave me drink, I was a stranger and you welcomed me, I was naked and you clothed me, I was sick and you visited me, I was in prison and you came to me."

In the early nineteenth century there was a revival of the ideal of mercy and an effort to help people made paupers by the industrial revolution and people who were paupers because of discrimination. Bishop Joannes Zwijsen, who had founded the Sisters of Charity in 1832, founded in Tilburg in 1845 the Brothers of Mary, Mother of Mercy (also known as Brothers CMM). This Roman Catholic order of brothers had the mission to serve the poor (see `www.cmmbrothers.nl/english` for some details of the history and current activities of the Brothers CMM). Over the following 90 years, the order spread around the Netherlands province of Noord-Brabant and to Belgium (1851), Surinam (1902), Indonesia (1923), Kenya (1958), Namibia (1958), California (1963), and Brazil (1980). The brothers' vocations often involved the education of young (and sometimes secondary school) children, particularly children with disabilities such as deafness and blindness.

By the middle of the 1900s, however, "mercy" was a word no longer much heard in the Netherlands, and when it was heard it had a negative undertone. Also, as times changed, fewer men joined the order; the existing members of the order grew older and retired from day-to-day teaching; and by the end of the 1970s the order had substantially lost its inspiration and identity, at least in the Netherlands. Today the future of the Brothers CMM as a traditional religious order lies mostly in Indonesia, Africa, and perhaps Brazil.

Wim Verschuren

Wim Verschuren was born in 1933. His father was a farmer who was killed in World War II when Wim was 9 years old. At age 18 Wim joined the Brothers CMM. Brother Wim says that at that time the Brothers CMM had a culture of "bow and obey"; for example, a brother might get a letter from the order headquarters saying that he had been replaced in his current assignment and was to move within three days to his next assignment. Brother Wim became an elementary school teacher, and at age 24 he was teaching children at an institute for the blind, working day

and night, seven days a week.

Then suddenly Brother Wim's life changed. He was ordered to go to university; this was unusual, as previously brothers had not been permitted to go to university. At university he studied pedagogy, and then he taught in a teacher training college. Brother Wim could have remained teaching at the college level, but he was appointed a member of the board of the Brothers CMM order, and so he left academia and from 1968 on served the order directly again. This was a time when a number of brothers and sisters in many religious orders were giving up their vocations and returning to lay life. Many of Brother Wim's own colleagues were leaving the order. When he was appointed to the board, he intuitively said yes and decided to remain in the order, and the renewed commitment gave him energy and freedom to do new things.

Later in the 1970s Brother Wim was appointed to be superior general of the Brothers CMM. As superior general of the order, Brother Wim spent lots of time in Africa and Indonesia, helping to diffuse the vocation of mercy. Part of the revitalization of the order in Africa and Indonesia involved pulling down some existing schools and starting new schools from scratch, which was something of a shock for the entire order. In 1990 Wim retired from his service as superior general. In his view, he had done a lot in Africa and Indonesia, and now it was time to do more in Europe. In particular, there was a growing crisis in the order in the Netherlands.

Brother Wim wrote,

> We had lost our identity and our inspiration due to the fundamental changes in church and society. The result being, that we threatened also to lose each other and that our sound self-respect began to fade. I experienced this crisis personally and as an executive, as a member of the board of our Congregation. Being aware of the fact that my community and I were only able to overcome this crisis by renewing our spirituality, we started a process of re-sourcing. And in its course we rediscovered mercy as if it were a precious stone that we had to find first and subsequently remove a lot of dust before we could see how beautiful and colourful it was. It took many years before we recovered a new identity and pride in mercy and before it became a guideline in our everyday life and work and in leadership.

> When we celebrated our 150th anniversary in 1994, we gave publicity to what we had experienced to be of vital importance. Being old, we wanted to pass this heritage on, in the conviction that mercy is more than ever relevant to our present society. Much to our surprise, it was well received by individuals and by groups. Moreover, it appears that people in some other places in the Netherlands were working on a revaluation of mercy.[7]

Essentially, the order had understood that mercy was still a relevant concept and that they needed to embrace it again and find contemporary approaches to practicing it.

Renewed Movement of Mercy

With the order having reembraced its mission to provide mercy, in 1998 Brother Wim had the somewhat surprising idea to put a recruiting advertisement in the newspaper saying that the Brothers CMM were looking for men to join them as brothers with no possibility of marriage, conventional careers, or money; the ad also asked for "allies [lay people, nonbrothers] in the movement of mercy." This ad caught the public's attention via TV and newspaper reports, and men applied.

Understanding that they were on to something, Brother Wim led the Brothers CMM's effort to launch, starting in December 1998, an explicit Movement of Mercy. In the years that followed, the Movement of Mercy grew beyond expectations. Brother Wim Verschuren led these activities until he stepped down as chairman of the board of the Movement of Mercy at a semiannual meeting at the ZIN facility in Vught on November 5, 2005.

ZIN center in Vught

The Brothers CMM have had to close a number of their locations over the years. Brothers have aged and died, and few new men have joined the brotherhood, and apparently society has needed less of the services the order provides. However, when it came to the church and brothers' residence in Vught (near the founding location of Tilburg), the order did not want to sell the property to others. Among other things, this was the

location of a cemetery containing the graves of 900 brothers.

Brother Wim met with hundreds of people as he investigated possible ways for the order to hold onto the Vught property. In particular, he was acquainted with a man named Leendert Bikker, who was part of a consultation, marketing and venture company. Bikker connected Brother Wim with various people in industry, and eventually a sort of joint venture with Leendert Bikker came about that would allow the Vught property to be redeveloped and reused with the brothers still involved. The Brothers CMM were able to provide their share of the investment thanks to funds from the sale of an old elementary school.

At Vught the brothers built a modern building attached to the church; the new building provided conference facilities and the church remained an integral part of the new complex. Once this construction was done, a new residential building was built for the brothers who still lived there, and the brothers' old residential building was torn down. The conference center, although a commercial entity, was designed and organized to maintain strong ties with the Brothers CMM and their tradition of providing mercy.

The complex is now know as the "Zin in Werk" center (or ZIN for short); the name has to do with finding meaning (*zin*) in work or in life more generally. A premise is that in modern life people are having increasing trouble balancing personal, family, and work needs. They may not like their work, but they have to make money to support their families. Also, links within the family may have become weak, for a variety of reasons. Brother Wim believes that society needs to create a new system to balance work life, spiritual life, and family life. He also believes the key is not money but relations among people. (He feels the brothers have considerable insight about relations among people: They explicitly join the order knowing they will live in communities, the younger brothers take care of the brothers who are growing old, and the brothers also revere and take care of the grave sites of the brothers who have died.)

ZIN markets itself particularly to groups of people from the worlds of education, care services, and government — groups that are interested in helping address important current problems in the Netherlands. There

Figure 3-3. Brother Wim and a typical ZIN overnight room, dining room, and conference room.

are three types of customers of ZIN. Some customers merely rent the physical facilities and hold their own activities. Some customers hire a combination of an outside expert and members of the ZIN staff to provide, for example, police officer training, Catholic leadership training, spiritual facilitator training, facilitator training for people dealing with kids with mental problems, and the like. Finally, sometimes a conference organizer rents the facility and ZIN provides instructors; for instance, for a three-and-one-half day "personality training" seminar (including presentations relating to personal development, individual consultation and diagnosis, and meditation sessions).

The physical facilities are an integral part of the ZIN package. There are 38 rooms for staying overnight, a dining room, and conference rooms (Figure 3-3). All are simple, but clean and comfortable. The more traditional monastic cloister environment is also available to the guests, who are encouraged to spend time in it and understand its symbolism. The setting includes garden areas and, during a meditation seminar, a room that may not be approached except for meditation (Figure 3-4).

The economics of ZIN have not been easy. They had a loss in 2000, and in 2003 a funding foundation stopped providing support. However, they persevered. By late 2005 they were nearly full all the time; and ZIN's director, Henk-Jan Hefman, is improving the business side of ZIN. He has two sections that work for him: (1) The context section deals with overnight accommodations, food, conference rooms, cleaning, and so forth; while (2) the content section works with clients on development of programs. Hefman draws on the "brothers' spirit" in the context section (two brothers work in ZIN) but uses outside professionals for the content part. He personally does not like marketing and says that everyone involved must be a marketing manager. He has a clear business model for ZIN: (1) Focus on topics relating to spirituality and a combination of business and spirituality; (2) Use the brothers' spirit (for environmental context) and outside professionals (for content) to complement each other; and (3) find links between and integrate realistic daily life, economic life, and spiritual reflection. From this description we can see that Director Hefman has developed his own view of how ZIN should function while remaining true to the concept of the visionary leader, Brother Wim.

Figure 3-4. The ZIN environment emphasizes the spiritual. Shown here are a church interior with copies of the Master of Alkmaar's paintings of the Seven Works of Mercy, the cemetery, the garden, and a meditation session.

Brother's Wim's methods

From this account of ZIN, you can see that Brother Wim never gives up (principle 2), even in the face of the most profound and relentless societal changes in values. He just keeps working on "re-creation."

When asked about his approach to revitalizing activities, Brother Wim explained that he always aims for re-creation and that that may be his talent — to rebuild an organization that has deep problems. He noted that he rebuilt the order's activities in Kenya and Indonesia, revived its historical dedication to mercy, and rebuilt the church at Vught. Regarding specific success factors, Brother Wim noted:

- Vision is important — I am not a person of analysis, but my colleague, the director, is a very analytical person.
- Take a risk — we often want to control the future, and if we cannot control it, we avoid deciding; but a leader needs to decide something, with courage and vision.
- Be flexible — sometimes things go differently than we originally intended, but you need to be flexible enough to change your road to the goal.
- Facts speak — concrete results tell you the truth; you need to see both good idea and the results.
- Belong to a community and fulfill your responsibilities — in the Brothers CMM, religion provides cohesiveness among people; without a foundation of cohesiveness, it is impossible to accomplish your goal.
- Involve the right people — you need people with different skills who embrace your goal.

Brother Wim also has a strong belief in a brand identity, and the ZIN center works to maintain its high-level brand image. They maintain on display a very valuable painting loaned to them by an important insurance company. They have large grounds (seven hectares, or over 17 acres, or about one-sixteenth of a square kilometer) that are a pleasure to walk through or look at, as shown in Figure 3-4. The center held a competition among three famous architects to construct the new building and integrate it with the church. The building looks good inside (bamboo floors and wooden walls) and outside and won an architecture prize.

Outside-in communication

While a leader may have the determination to never give up, there is also little point in knocking directly on doors that will not be opened to you. There is a tendency for messages following the traditional path from the top to the bottom of an organization (the left side of Figure 3-5) to be ignored — "just more attempted manipulation from the top," employees may think. No matter how much the leader explains and cajoles, and

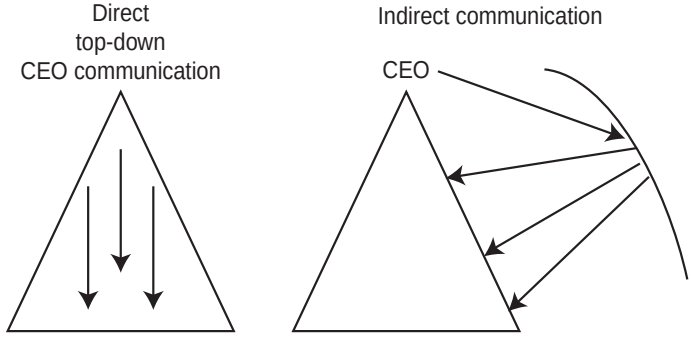


Figure 3-5. Direct versus indirect communication.

no matter how carefully the leader acts to be consistent with his words, people in the organization who do not want to change will resist (and even be cynical about) his example. Surprisingly, an often more effective way to get people's attention is to arrange things so the desired information and pressure comes from the outside world back to the people in the organization. Toward this end, some leaders take their ideas to the world at large, where they may be reflected back to the organization (right side of the figure).

In the case study of Humanitas in section 3.1, Dr. Becker used outside-in indirect communication methods, including talking with journalists about his own experiences while he was hospitalized in a Humanitas apartment and engaging in regular promotion of the Humanitas story on TV.

Andrew Grove's book, *Only the Paranoid Survive* (Grove99), describes how a company has to listen more to its customers. This book became famous and was widely read. Consequently, people inside Intel (his company) undoubtedly were motivated to read the book and thus learned

much more about what Grove thought than they would ever have absorbed from internal memos and presentations. (Imagine what would have happened had Grove sent a book length internal "memo" to all employees.)

Some years ago, Dr. Koji Kobayashi did the same thing when he was trying to promote the convergence of computers and communications in his company. Kobayashi was president and later chairman of NEC[8] from the 1960s to the 1980s. He foresaw the convergence of computers and communications, and he strongly promoted convergence as NEC's corporate mission and "C and C" (Computers and Communications) as NEC's corporate slogan. He wrote books (Kobayashi86, Kobayashi91) that were widely read (and translated into English as well); everyone in his own company also read Kobayashi's works and knew what he thought needed to happen.

We suspect that Bill Gates's books (Gates96, Gates99) served a similar purpose — communicating Gates's vision of an Internet-based future to the world at large but also to employees within Microsoft, at a time when Microsoft was behind in its Internet orientation.

Each of three times Dr. Matabee Maeda visited MIT to present his case study (see page 103), he published a brochure describing his visit and his presentation of the Maeda company story at MIT. This brochure was sent to customers and others in the world outside Dr. Maeda's company. However, being available to customers, the information also undoubtedly spread through the company's own employees without necessarily seeming to be a lecture from the CEO.

Certainly Brother Wim's Netherlands-wide Movement for Mercy was an indirect way of addressing his own brothers and the potential users of the ZIN facilities. Brother Wim successfully communicated the need to embrace a modern interpretation of mercy and encouraged people to make use of modern facilities and training to better apply the concepts of mercy to others and themselves.

Shoji Shiba saw a slightly different approach to indirect communication in China. The CEO of the Zhong Xing Telecommunication Equipment Company Limited (ZTE), one of China's largest makers of telecommunications equipment, spent a large amount of money, for a Chinese

company, to give all managers three books each month. The books related to the business and to the philosophy of the CEO. Each manager was required to talk about the books four hours a week to their subordinates. Perhaps the subordinates began to remember the common language of change represented in the books the CEO carefully selected. Certainly the managers themselves could hardly help but be influenced by this process.

3.3 Reflection

Principle 1. The visionary leader must do on-site observation leading to *personal perception* of changes in *societal values* from an *outsider's point of view*.

Principle 2. Even though there is resistance, the visionary leader *never gives up*; the leader squeezes the resistance between *outside-in* pressure and top-down inside instruction.

Thinking again about the first task shown in Figure 11 on page 44 and about principles 1 and 2, the first jobs of the visionary leader can be illustrated as in Figure 3-6. The leader must perceive the invisible societal change and then identify what the business's transformational needs are. From both of these activities, the visionary leader needs to form a strong belief in the reality of the societal change and a philosophy about how the business should be transformed. This belief and vision need to be so strong that the leader will not give up in the face of the inevitable resistance to change.

To perceive invisible societal change and identify transformational needs requires deep and skilled perception of what is happening in the business's world and in the greater society. Chapters 6 and 7 will describe specific methods and tools for attaining such deep and skilled perception. First, however, Chapters 4 and 5 will examine the remaining five principles of visionary leadership.

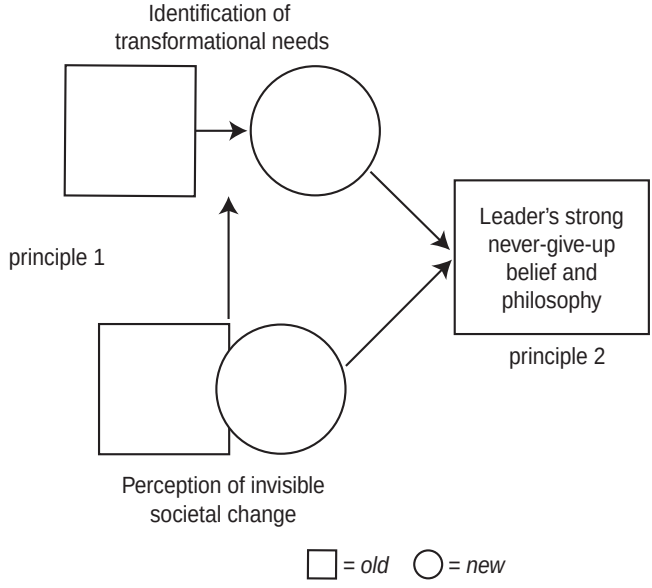


Figure 3-6. Essence of principles 1 and 2.

Chapter 4

Initiate Transformation

This chapter addresses the second breakthrough task shown in Figure 11 on page 44 — initiation of the transformation. This is a process of disrupting the existing business, putting a new mental model in place, and beginning to force change consistent with the new direction, as distilled in leadership principles 3, 4, and 5.

4.1 FAVI and principle 3

Principle 3. Transformation is begun with *symbolic disruption* of old or traditional systems through *top-down* efforts to *create chaos* within the organization.

We saw examples of principle 3 in the Humanitas and ZIN case studies in Chapter 3. For instance, Humanitas stopped hiring consultants, let 20 or 30 percent of the doctors leave the organization, knocked down a traditional elder care building, proscribed white uniforms for health care professionals, disclosed all business results, and began to call residents "clients" instead of "patients."

When Brother Wim became the leader of his order, he went to Indonesia and closed schools and started new ones from scratch, which was a shock to the entire order. In the case of the ZIN center, he set it up so it was run by a separate company and not by the brothers themselves; this was a break with past practice.

The Seiko case study that we will examine in Chapter 8 contains a particularly dramatic example of intentional disruption of an existing organization to enable change; as shown in Figure 8-5, one-third of a

division's people were transferred to other divisions of the company, one-third of the people were encouraged to take early retirement, and that same number of people were newly recruited into the division.

Let's turn now to the case study of FAVI, where we will see additional examples of how a visionary leader causes symbolic disruption.

Jean François Zorbist

Fonderie et Ateliers du Vimeu (FAVI) has 500 employees and is located in northern France, in Hallencourt, about 170 km (106 miles) from Paris. As shown in Figure 4-1, FAVI provides a good example of the inflection point idea shown in Figure 2-3 on page 21. FAVI's early business of making "sanitary siphons" that prevented sewer gases from coming into a room via a sink drain leveled off and eventually died. Today FAVI makes parts for gauges that meter water (a nongrowth business) and automobile parts, particularly shift forks (a growth business). FAVI is attempting to expand its business of making high-conductivity brass rotors for electrical generators. All of FAVI's product areas over the years have related to its core technology of high-pressure die casting. FAVI's visionary leader is Jean François Zorbist.[1]

Jean François Zorbist joined FAVI's parent company, AFICA (Affinage Champagne Ardennes, or Champagne Ardennes Refinery), in 1966 at the age of 21, after receiving a metalwork diploma and doing his military service. Over the years, Zorbist has worked in all of the functional areas of the company: production, development and design, process control, quality control, sales, and so on.[2]

FAVI was originally a client of AFICA, but when FAVI ran into financial trouble, AFICA bought it. Over the next years, Jean François Zorbist dropped by FAVI from time to time as part of the effort of Max Rousseaux, CEO of AFICA, to keep an eye on things at FAVI. In the early 1980s the man running FAVI for AFICA decided to leave, and Rousseaux asked Zorbist to find the next person to lead the company. But Zorbist's several suggestions were rejected by Rousseaux. Then, one day in April 1983, Rousseaux took Zorbist by helicopter from Reims where they worked and where Zorbist lived, to FAVI in Hallencourt. There the CEO

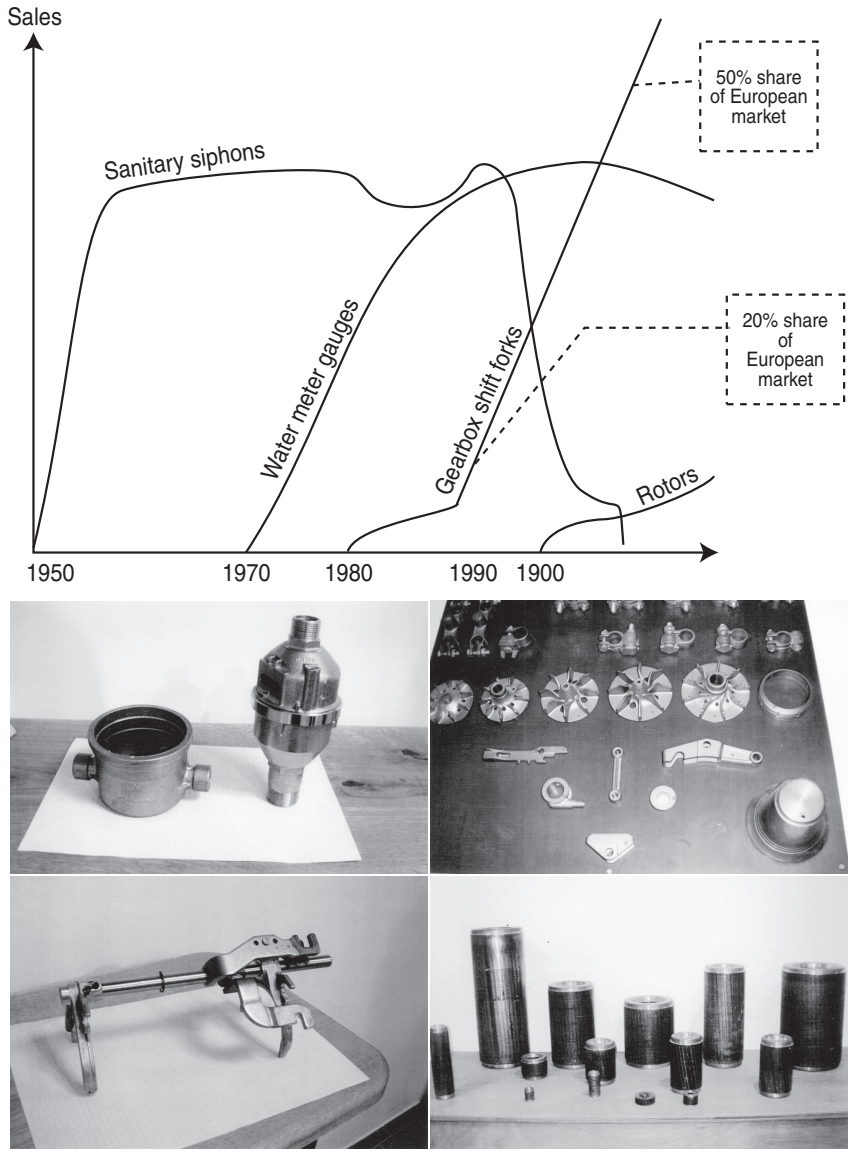


Figure 4-1. FAVI's changes of business since 1950: sanitary siphons for sink drains (top left photo), water gauges (top right), automobile shift forks (bottom left), electrical generator rotors (bottom right). (Figure created by French quality expert Martine Morel.)

called the FAVI employees together and announced (to Zorbist's great surprise) that Zorbist was the new CEO of FAVI.

For the next four months, while his predecessor remained to run the company at Zorbist's request, Zorbist observed how FAVI operated. He found what many would have considered a factory that was well managed by the standards of 1983. Included were an office on the top floor from which the CEO would observe the whole factory; careful timekeeping of hours worked (and penalties for lateness); locked storage areas for consumables such as workers' gloves; a central coffee station where employees could buy a cup of coffee; a traditional hierarchical and functional organization (planning, financial, personnel, purchasing, supervisors, shop foremen, department managers, chiefs of staff, etc.); lots of executive positions and activities (management board, executive officers' meetings, planning meetings, meetings to consider the previous month's quality problems, etc.); monthly production bonuses; and the like.

The company seemed to run well. However, because Zorbist explicitly took time to observe things and did not immediately take over operational control, he had the time to think about the ramifications of the existing management system rather than just adopting it. And he began to see inefficiencies: The company lost more money in employee time than it saved by controlling the storage area and having a centralized coffee area; the many meetings tended to focus on things that were long gone by and to serve as an arena where old scores were settled and excuses were made; the focus on accurate timekeeping was offset by employees who would queue up waiting for the end-of-day bell to ring so they could check out; and bonuses were being laboriously calculated for levels of activity over which the employees had little control.

One day Zorbist was about to mow his lawn at home, but his lawn mower misfired. So he got out some tools and cleaned the spark plug. This corrected the problem, and he felt rather proud of himself. Then he had an epiphany: At work, a multi-step, multi-person process would have been required to get something fixed if a worker's equipment had a problem. Perhaps, he thought, he could do something to let workers fix their own machines.

FAVI's existing system, Zorbist reflected, made the assumption that

people were bad and needed controlling. He tried to imagine an organization chart in which the assumption was that people were good. Not knowing quite what to do first, he took some symbolic steps. For instance, he bricked up the window that allowed him to observe the whole factory from his top floor office.

Then, around the end of the year, Zorbist called his entire staff together and announced he was implementing a people-are-good management system. He was eliminating the timekeepers, the end-of-day bell, and the lateness penalties; the goal would be to make good parts, not optimize time. He abolished the production bonuses and integrated the bonus amounts into the normal pay rate. He unlocked the consumables stockroom, and told workers to write down what they took so it could be replenished. He put a free coffee station in each workshop, so employees didn't have to take time to walk to and from the central pay coffee station. He also eliminated the regular managers' and planning meetings. In our terms, Zorbist had clearly applied principle 3: From the top, he made symbolic disruptions that initially risked (at least emotional) chaos within the organization.

CEO Zorbist had an explicit image of what sort of company FAVI should be. According to him, FAVI's goal was to continue to *durer* — to continue to last — in its town in France by working intimately with its customers to continually adapt to current customer needs.[3] As shown in Figure 4-2, Zorbist adopted the tree for his symbol of the company. He asked rhetorically, "Does a tree want to be number 1 or the best?" No; a tree just wants to last — to *durer*. The objective of FAVI is the same — just to *durer* in the small village of Hallencourt.

Zorbist's next rhetorical logic was,

> What do people need to *durer*? Please close your mouth, hold your nose, and stop breathing. . . . I hope you understand what is necessary for humans to *durer*. They need air.
>
> Air is necessary for humans to *durer*. What is necessary for FAVI to *durer*? The answer is money. We French tend to think that money is not decent. But we need money to *durer*.
>
> How do we get money? Good quality of product is not enough. *L'amour* from each customer is necessary to get money.[4]

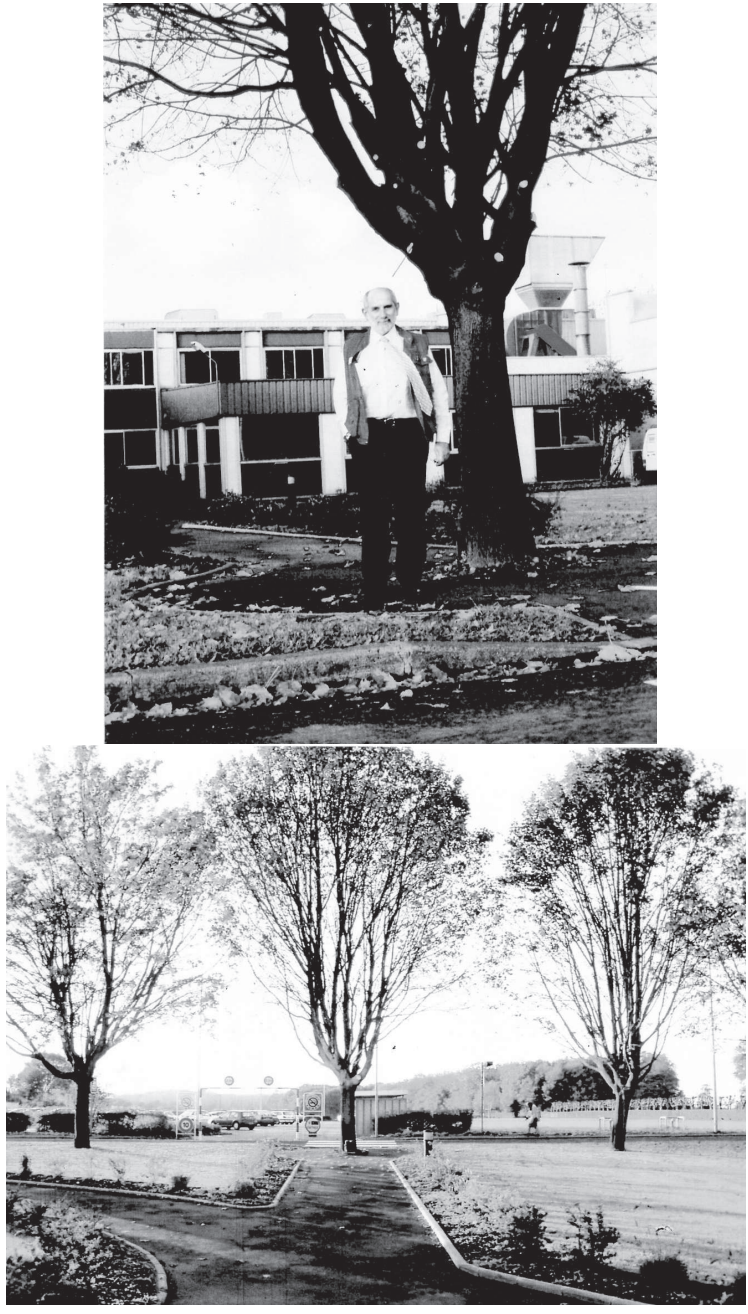


Figure 4-2. Top: Jean François Zorbist and a tree. Bottom: Trees are symbols on the FAVI campus.

Dramatically, Zorbist compared what FAVI needed to the tactics of a streetwalker: A streetwalker has to look attractive to her customers, so she wears a little makeup to be noticed (FAVI will be clean and painted in bright colors); she specializes in something customers want (FAVI will make the best possible pieces of rough cast metal); and she is careful not to give her customers illness (FAVI will have no delivery delays and will produce nothing with poor quality). Finally, there was the question of what price to set for their services; Zorbist stated that FAVI would never raise its prices again, so that one day they would have the best prices in France — perhaps the world.

Later, Zorbist encountered a new problem as the business expanded: The person leading the machining department couldn't manage the department as it grew in size. Rather than changing managers, FAVI set up a minifactory for each specific customer. This solved the management problem and created *amour* — an intimate relationship with the particular customer.

Jean François Zorbist likes to show the illustration reproduced in Figure 4-3. The figure caption gives his explanation for this figure. In describing his concept, Zorbist makes it clear (as was explicit with the streetwalker simile) that he includes the sexual connotation of *l'amour* in

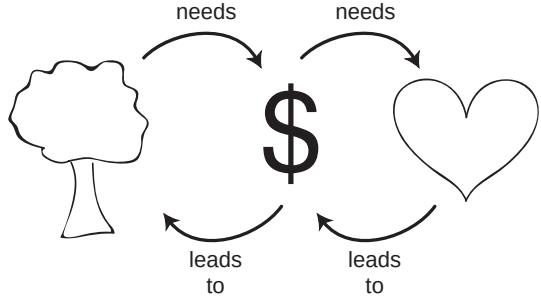


Figure 4-3. To *durer* — to exist in place like a tree — requires money; and money, in turn, requires being loved intimately by a single customer. Doing what it takes to be loved intimately by one customer leads to dollars, which lead to the ability to be like a tree and stay in one place.

his view of the metaphorical love relationship with the customer. FAVI and the customer work together from conception — cooperating on R&D as well as on design and the production of products for the customer.

Jean François Zorbist stepped down from the role of CEO of FAVI in 2005, but he remained with FAVI providing support for the new young CEO. Let's now consider the management system that Zorbist put in place.

FAVI's management system

FAVI provides a particularly good example in relation to the three approaches to survival listed in Section 2.4 (page 39): (1) FAVI does not want to move; (2) FAVI works together with its customers to continually adapt to their current needs for attractive quality; and (3) FAVI has worked at developing entirely new products using its core technology of high-pressure die casting.

The new system of management used by FAVI flows from the CEO's *beliefs*, as shown at the top of Figure 4-4, Shoji Shiba's partial model of FAVI's management system.

At the top of the model, we see that CEO Zorbist believes "people are good"; that is, that people deserve freedom from rigid external control. The company eliminated procedures for attendance (i.e., time clocks), stopped the premium system (i.e., piecework payment), and encourages open discussion of all business information. In other words, the CEO decided to trust the employees — he moved from a Theory X to a Theory Y approach to management (see Figure 2-12 and the discussion on page 38).

Once upon a time, workers thought of work in terms of doing their job in the specified way; we call this "product-out." More recently the pressure of competition and rapid change caused the concept of work to evolve to be "satisfying customers"; we called this "market-in."[5] And in the FAVI case we see a further evolution of the concept of work. When freedom and trust are considered in the context of CEO Zorbist's analysis of Figure 4-3 — the idea that to exist in place like a tree requires money and that money, in turn, requires being loved intimately by a single customer — what emerges is a new *concept of work*. The new concept of

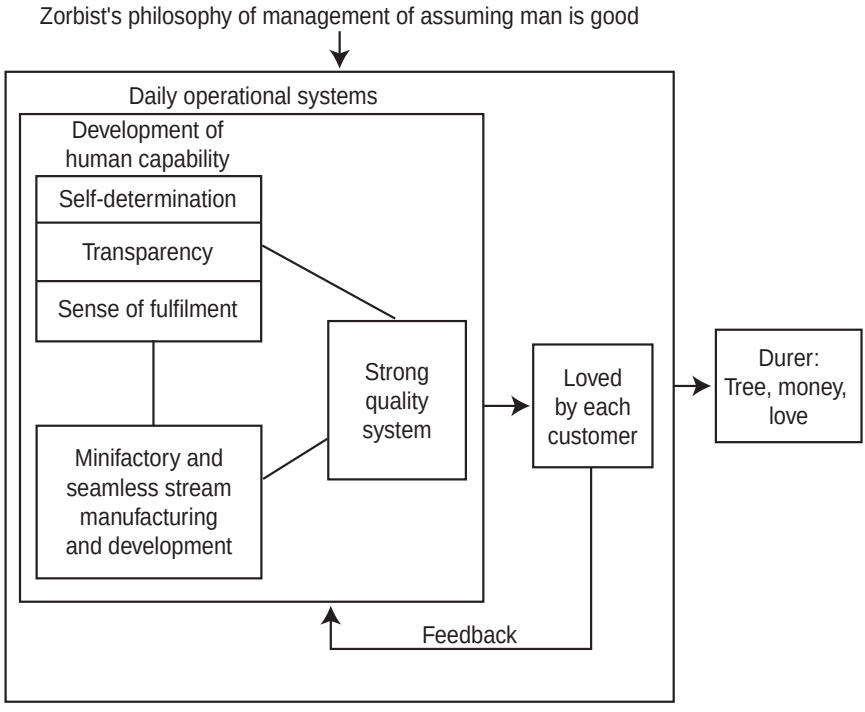


Figure 4-4. Model of the FAVI management system.

work relates to the specific customer rather than to customers in general, and it involves the situations of the workers (continuing to exist in their town); in other words, the new concept of work combines more specific versions of product-out and market-in in a win-win situation for workers and customers.

FAVI's system for developing and producing its product is shown to the left and a little below the middle of Figure 4-4. The system has two major components.

First, FAVI has *minifactories* dedicated to particular customers, as shown in Figure 4-5. There may be more than one minifactory for a particular customer, as shown in the figure. About 20 such minifactories exist. A minifactory is a production facility with its own set of equipment and with a leader and perhaps 20 other people. The leader functions as a mini-CEO with responsibility for getting the next job from the customer.

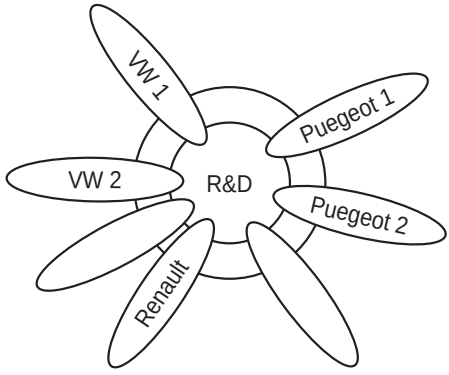


Figure 4-5. Multiple minifactories.

And each minifactory has its own goals in relation to, for instance, production plans, human resources, and investment in training and other methods of increasing productivity.

Second, FAVI has *seamless integration* from R&D through sales, manufacturing, and postsale follow-up. In the same building with the minifactories and their leaders works a strong, 30-person R&D group covering two shifts and a 15-person customer relations group from which one person provides liaison to the customer of each minifactory.

Near the top left of Figure 4-4 the *human system* is shown which is aimed at maximizing employee motivation. It is based on principles of self-direction, transparency, and a sense of efficacy. The minifactories are a version of self-directed work teams in which each team is empowered to plan production and to take action to increase the skills of the team and its members (including providing a single employee with skill in more than one area). The transparency includes FAVI's openness with financial figures (such as sales and profits), with a goal of greater mutual trust within the organization. There are also bonuses awarded at four- to five-month intervals. Finally, the feeling of effectiveness — of fulfillment and gratification for a job well done — is fostered through intense training (10 to 12 percent of FAVI's personnel costs, versus a French average of 2 percent) and through company-sponsored visits to other companies and to countries such as Japan and Poland.

Regarding the *quality management system* (center of Figure 4-4), in

1983 FAVI was the first company in France to introduce the 5S method.[6] In 1987 FAVI became the first company in France to introduce Total Productive Maintenance (TPM). And in 2002, FAVI was the first company in France to be certified in ISO 900IV 2000, QS 9000, FAQF ISO 14001, and OHSAS 18001.

Feedback is implicit in the parts of the FAVI management system we have described. The customer-specific minifactories, the R&D department responsiveness to customers, and the customer relations person who interacts between a customer and the minifactory and R&D department all provide strong feedback paths.

4.2 SOL and principle 4

Principle 4. The direction of transformation is demonstrated by a symbolic *visible image* and by the visionary leader's *symbolic behavior*.

Humanitas (Chapter 3) provided a giant physical "visualized direction" through the construction of its first mixed-use building complex, with apartments for healthy as well as ill residents and with retail businesses that made the complex into its own little village integrated with the surrounding town. The building complex clearly showed Humanitas's aim — to provide an attractive and lively "home for life" for the elderly people who came there to live.

At ZIN (also Chapter 3) the visible image is more of a spiritual and long-term symbol. ZIN's goal was to continue its historical spiritual mission of mercy. The decision to co-locate the new facilities with the cemetery where the Brothers CMM had been buried for more than 150 years and with the church and its reproductions of the works-of-mercy paintings clearly indicated the direction in which ZIN intended to keep going, albeit with somewhat modern means.

At FAVI Jean François Zorbist summarized his philosophy in one small illustration (Figure 4-3) and with vivid language about intimacy with customers.

Let's turn now to the uses of visible imagery and symbolic behavior at SOL, a Finnish laundry and cleaning company.

SOL and Liisa Joronen

SOL is a family-owned service company based in Helsinki, Finland. It provides laundry services to consumers and to other businesses; it also provides a variety of facility services including contract cleaning and janitorial services, building maintenance, and various specialized services from gardening to reception services. The company has 7,200 employees, a large number of whom are hourly employees. The company's 2005 revenue (turnover) was 118 million Euros (roughly $140 million).[7]

The roots of SOL go back to the early 1900s when SOL CEO Liisa Joronen's grandfather bought a small dyeing, laundry, and dry cleaning business named Lindstrom. Joronen's father expanded the business to include textile rental and then office cleaning. Ms. Joronen always intended to participate in the Lindstrom company, and in 1981 she was appointed managing director. But Ms. Joronen's innovative ideas for how the company should be managed clashed with the more traditional management ideas of other members of her family. Therefore, in 1991, Ms. Joronen's father split the company in two parts. Liisa Joronen took the (then unprofitable) cleaning business, while her brothers and sister took the laundry and linen rental business.

Freedom is important in Finnish culture. In particular, freedom is a key aspect of the personal philosophy of SOL CEO Liisa Joronen and is thus an important aspect of the SOL company culture. SOL boasts:

- freedom from working place
- freedom from working hours
- freedom from status symbols

SOL employees often work from home. There are no fixed desks at the head office — there are not as many places to sit as there are employees in the head office. Work shifts are available any time of the day or night and any day of the year. CEO Joronen herself doesn't have a private office, car, or secretary.

When SOL was launched on its own, with more enthusiasm than finances, the firm rented the studio space of a bankrupt movie company, and the early employees contributed numerous suggestions about what the office environment should be like. In particular, they decided

Figure 4-6. SOL City and SOL culture.

it should be less like an office and more like an imaginary home. A unique office design resulted that — in accordance with principle 4 — immediately showed both clients and employees that something different was happening at SOL, as did CEO Joronen's eschewing executive perks.

Joronen says, "SOL City, our head office, is a symbol of our corporate culture. Our corporate culture is freedom." As shown in the top left photo of Figure 4-6, SOL City is free of a standard office style. As shown in the top right photo, seating is quite untraditional — there are no traditional desks and no private offices. Also shown in that photo (lower right corner) is a long black piece of furniture that contains lots of "cubbies" — as in kindergarten — where employees store their belongings. In the bottom left photo, we see CEO Joronen, who has come in late and has found a place to sit in the company kitchen. The other offices of SOL are also conceived by the local employees, the only rule being that work spaces must reflect the company's philosophy of "freedom, responsibility, trust, creativity, happiness at work, and learning throughout life" (Jouslin de Noray06, Chapter 2).

When employees visit customers, they wear uniforms (Figure 4-6, bottom right) that are very bright — like the sun (*sol*). SOL thinks of itself as "the sunny company" (see `www.sol.fi`). Ms. Joronen herself always wears yellow in both business and private life.

Based on his visit and his study of SOL, Shoji Shiba uses the model shown in Figure 4-7 to depict how SOL manages as a company.

SOL carries out its business using small enterprises — "self-directed work groups" of 5 to 10 people. There are hundreds of these small enterprises, each with its own group leader. The small enterprises have freedom to change their approach or style of work to adapt to customer needs. They also have freedom to invest enterprise resources in obtaining manpower and new skills.

There is no companywide target. Rather, each small enterprise sets its own five targets. The five small enterprise targets include:

- total sales per year
- customer satisfaction (on the laugh-smile scale of Figure 4-8)
- profit
- investment in training and education
- a diagnostic score, rated by a company team

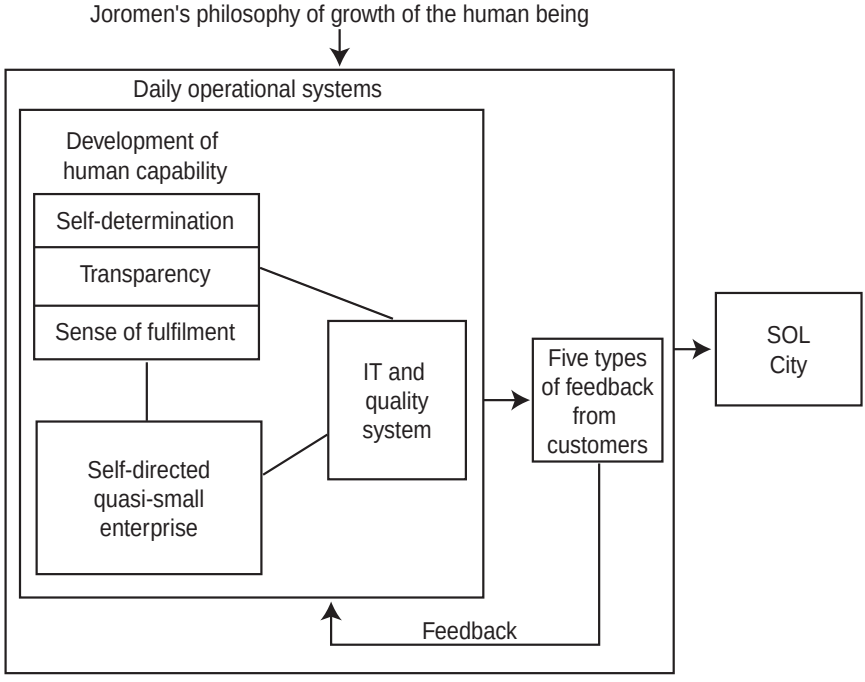


Figure 4-7. Model of the SOL management system.

Each small enterprise also has responsibility for participating in two "SOL Days" in January and two in August. During SOL Days the hundreds of team leaders present their targets and results and decide on their challenges for the next period of time.

The SOL *human system* also is based on the self-directed work groups. Furthermore, all business information except personnel data is open to all employees. The goal of the human system is *human development*, not profit. The assumption is that personal gratification comes from

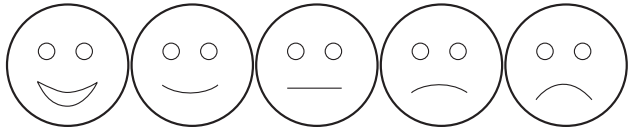


Figure 4-8. SOL customer evaluation scale.

self-fulfillment: from development as a human being, and from making the customer happy.

As already stated, SOL doesn't use company targets. However, without a company target, something else is needed to align activities throughout the company. For such alignment SOL employees actively empathize with and obtain direct *feedback* from customers. SOL people see themselves as part of the customer's business and see customers as a part of SOL.

At SOL the self-directed work groups regularly seek fives types of feedback:

1. monthly feedback (as described below)
2. direct, anonymous feedback from customers
3. customer surveys by a third party
4. surveys of unhappy customers (for example, customers who have left)
5. diagnosis of the feedback system itself

Monthly feedback takes two forms: face-to-face questioning of the customers by the service worker (using a standard format of questions) and a monthly interview of the group leader by the area manager. The latter covers any gap between expectations and results; opportunities for improvement; a review of past commitments and results; the most important concern of the customer; and an overall evaluation on a laugh-to-smile-to-frown scale (see Figure 4-8).

It is Liisa Joronen's *belief* that the job of the CEO is to transform the mental setting within the company from a culture based on control to a culture based on full *trust* of the people and the resultant freedom for the people. This is why no overall company target is used (Joronen sees company targets as containing a hint of mistrust) and why self-directed work groups are the building blocks of the operational system. Joronen views SOL City as a symbol both of the workers' freedom and of the trust that is required to support the freedom.

Finally, the SOL management system depends on a *quality system* and an *IT system*. On the IT side of things, the company is 98 percent paperless. On the quality side of things, SOL's efforts enabled it to win the 1993 National Quality Award in Finland.

Making the goal visible

In essence, principle 4 involves two activities: making the goal visible and showing symbolic behavior. Here and in the next subsection we'll move beyond the SOL example to propose some specific approaches to these two activities.

First, we recommend a hierarchy of goals: *(a)* noble goals such as "better living through chemistry" or "benefit to customers" that will stand for many years into the future; *(b)* intermediate goals that extend three or four years into the future, such as "improve development process," "achieve six sigma," or Teradyne's "market share up, cost down, and cycle time down"; and *(c)* typical annual operational goals (Shiba93, pp. 339–340).

Of the goals in this hierarchy, intermediate goals are the most relevant to breakthrough. Intermediate goals are mental images or models of what the company should look like. In addition to stating the objective, intermediate goals do two other things: They provide an image of success, and they encourage behavior favorable to achieving that goal.

Some examples of success images are President John F. Kennedy's image of the United States putting a man on the moon within the decade, RCA Sarnoff Research Lab's desire to develop a TV that would hang on the wall, or Shuji Nakamura's dream of creating a blue color laser-emitting diode (L.E.D.). Such success images play an important role in motivating people toward the desired breakthrough.

We all know about the success of the U.S. man-on-the-moon program. At Sarnoff Lab, the expressed desire to develop at TV that would hang on the wall motivated much highly focused research. Shuji Nakamura focused his thinking on the color blue, the colors of light more generally, and the idea that if it was possible to make an LED of one color, it ought to be possible to change the materials to get another color.

We will see more such success images in some of the case studies later in this book; for instance, Dr. Maeda's focus on alternative ways of mixing concrete in the Maeda case study (page 103) and Alex d'Arbeloff's efforts in the Teradyne Aurora case study to move Teradyne toward use of Windows NT (page 192).

In regard to encouraging behavior favorable to achieving the goal, one

example comes from NEC's Semiconductor Division, which was trying to achieve customer satisfaction and high performance. The division's intermediate goal was to get a "half step ahead" of its competitors, and the desired behavior included components such as "visiting on site 100 times" and "face-to-face communication" (we will mention this example again shortly).

Another example constitutes, in effect, a subgoal for encouraging behavior favorable to achieving a larger goal. At the Internet Engineering Task Force's 1992 meeting, Dave Clark of MIT said, "We reject: kings, presidents and voting. We believe in: rough consensus and running code." Known informally as the IETF credo, we take this statement to mean, "Don't do things based on authority or popularity; do things because enough people are in agreement and they have something that works." For a long time, the approach described in the IETF credo allowed the Internet to develop without the sort of politically-motivated system designs and unhealthy or overly complex compromises that have come out of some international standards creation efforts in the computer and communications arena.

Intermediate goals must be described in *words*. Use both affective and objective language. Use affective words to state the goal clearly and simply in an easy-to-remember way. Use objective or logical words to attractively and innovatively capture the essence of what is desired and to focus attention on it.

Here are some tips for creating an effective goal statement:

1. Use behavioral words that indicate what to do going forward.
2. Fit the words to human nature.
3. Use the ladder of abstraction effectively.

The IETF credo includes behavioral words such as "reject" and "believe." President Kennedy's human-on-the-moon speech included behavioral words such as "choose to go" and "unwilling to postpone." There is a long tradition of the use of such "to be" and "not to be" behavioral words to help aim a company; we remember that Alfred Sloan stated his goals for General Motors in terms of "GM always does" and "GM never does."

Fitting the words to human nature means making the goal statement easy to remember — keeping it short and including only a small number of items to remember. For instance, Teradyne used MC^2 (**M**arket share up, **C**ost down, **C**ycle time down) as the intermediate goal for its push to implement Total Quality Management techniques. (Remember the efficiency of a three-legged stool — two legs are unstable, while a fourth leg is redundant.) The words also have to be well suited to the corporate culture. For instance, during a 2001 visit to Dell, Shoji Shiba heard the slogan "Kill Compaq"; this was consistent with the aggressive Dell corporate culture, and by 2002 Dell had indeed surpassed Compaq. Finally, repetition of the words is important if humans are expected to remember them. Repetition as a rhetorical tool has a long history: Think of Martin Luther King's "I have a dream" speech (1968); Abraham Lincoln's "government of the people, by the people, for the people" in the Gettysburg Address (1863); or the eight instances of "Blessed are . . ." in Matthew 5:3-10 (The Beatitudes) in the King James version of the Bible (1611).

An example of effective use of the ladder of abstraction comes from a presentation by Hazime Sasaki of NEC's Semiconductor Division at a JUSE (Japanese Union of Scientists and Engineers) conference near Tokyo in 1998 . Mr. Sasaki's intermediate goal statement included three components: (1) get a half step ahead, (2) visit sites 100 times, and (3) communicate face-to-face. Each of these three components was posi-

1.	Operational principle **Get a half step ahead** All businesses activities must move a half step ahead of competitors to meet market/customer needs.
2.	Action principle **Visit sites 100 times** Basics of business activity exist on site.
3.	Organizational principle **Communicate face-to-face** All business activity will be done through direct face-to-face discussion.

Figure 4-9. Effective use of the ladder of abstraction in NEC's intermediate goal statement.

tioned on the ladder of abstraction between a more abstract term and a more specific statement (see Figure 4-9). For instance, the "half step ahead" idea is the "operational principle" component of Mr. Sasaki's intermediate goal, and "all business activities must move a half step ahead of competitors to meet market/customer needs" is a more detailed statement of what "half step ahead" means.

Symbolic behavior

It is not sufficient to "talk the talk" about the new direction of the business and the ways in which it will operate. A visionary leader must also "walk the talk" by serving as a role model for the desired change. Any deviation between the leader's pronouncements and the leader's actions and decisions will be viewed with great cynicism by the employees of the business. As Frank Pipp (onetime director of manufacturing and R&D at Xerox) said to us a few years ago, "Employees can smell management hypocrisy at three parts in a million."

The leader is always being watched. The leader's actions are an ongoing source of symbolic meaning. Even if the leader does not intend to be performing a symbolic act (or any significant act at all), the people watching may well read symbolic significance into the act (or lack of action). Thus, a leader must never show lack of integrity. Always there must be consistency between the leader's words and actions.

The fact that the leader is always being watched is a potential source of power. The leader can show the desired strategic direction by presenting himself or herself as a role model. Recognizing the symbolic nature of his or her actions, the leader should use these actions to amplify the mechanisms of change within the organization.

Of course, various leaders (obviously not all) have known about the importance of providing a role model "for ever." For instance, the Medici family of Renaissance Florence recognized the importance of being seen by the public as part of the source of their power. When the Medicis built a theater in Florence, they included a space for themselves at the center of the theater — where people could see their behavior and power at public events.

U.S. examples from the last couple of decades include the Malcolm Baldrige National Quality Awards, for which CEOs toured throughout the country diffusing the message of quality. In 1990, as part of the founding of the Center for Quality of Management (`www.cqm.org`), the top managers of CQM founding companies presented symbolic role models by being the first people from their companies to attend the CQM's "six-day course" and (as shown in Figure 4-10) working at the class exercises as any less senior employee would.

Symbolic behavior is the key. In 1990, when Alex d'Arbeloff was leading the introduction of Total Quality Management into Teradyne, Teradyne held TQM seminars for all its employees that were taught by Shoji Shiba. Shoji Shiba gave homework assignments, and CEO d'Arbeloff would come 30 minutes before class to post his homework assignment in a central location on the wall of the seminar room. The other executives and managers followed Alex's model and posted their homework.

Another example of symbolic behavior comes from Louis Gerstner's *Who Says Elephants Can't Dance?* (Gerstner03). In a subsection of the book entitled "The Click Heard Round the World," Gerstner describes an early meeting he called to learn the state of the business:

> At that time, the standard format of any important IBM meeting was a presentation using overhead projectors and graphics on transparencies that IBMers called — and no one remembers why — "foils." Nick was on his second foil when I stepped to the table and, as politely as I could in front of his team, switched off the projector. After a long moment of awkward silence, I simply said, "Let's just talk about your business."
>
> I mention this episode because it had an unintended, but terribly powerful ripple effect. By the afternoon an e-mail about my hitting the Off button on the overhead projector was crisscrossing the world. Talk about consternation! It was as if the President of the United States had banned the use of English at White House meetings. (Gerstner03, p. 43)

Still another example of symbolic behavior comes from Shoichiro Toyoda of Toyota. In December of 1998, a three-day JUSE[8] conference was taking place at a hotel in Hakone (a mountain resort area some distance from Tokyo), and the Toyota Quality Division had organized

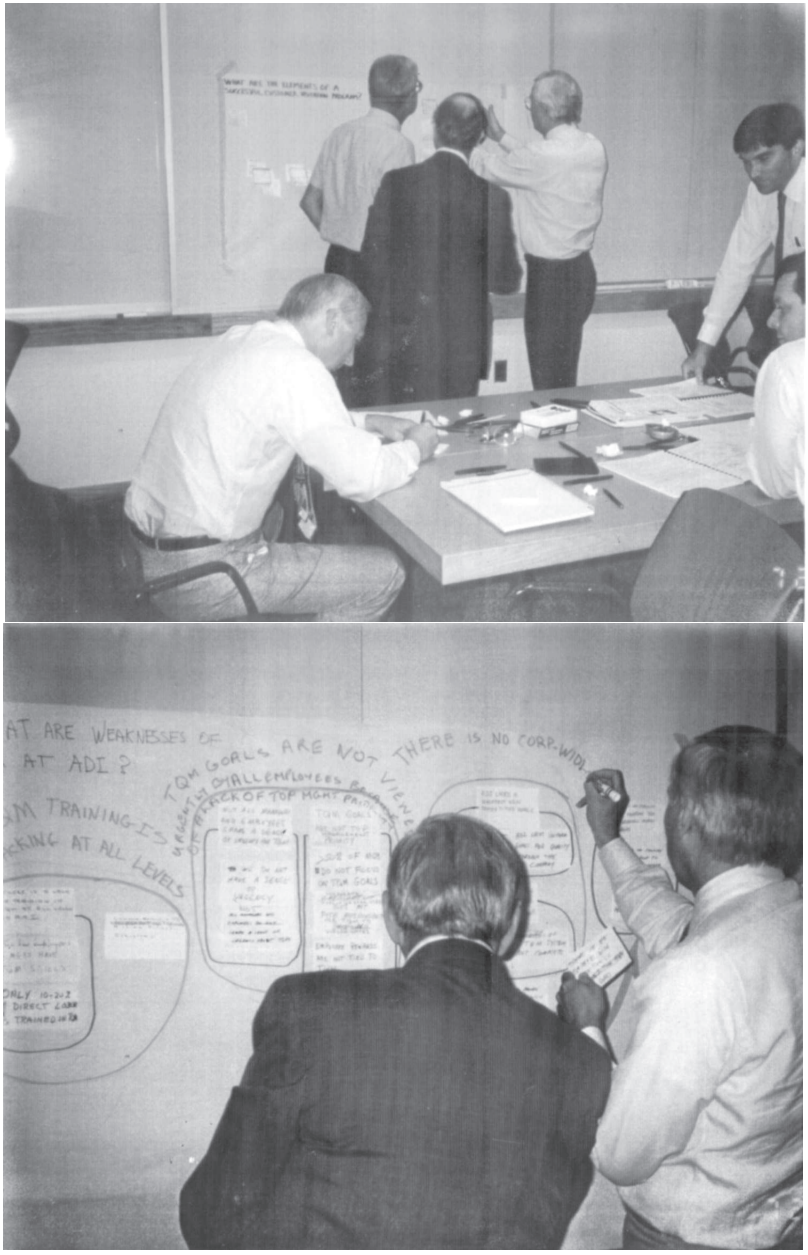


Figure 4-10. Executives participating in the CQM six-day course.

the conference speakers. Mr. Toyoda was to be the keynote speaker. But the president of Argentina unexpectedly scheduled a visit to the Toyota factory; as a result, one day before he was to speak, Toyoda had to cancel his keynote presentation in order to host the Argentine president. However, at 11:00 p.m. Toyoda arrived, through snow, at the conference hotel, having traveled all the way from the Toyota factory, and apologized to all the conference participants for having had to cancel his address. This symbolic gesture had considerable impact on the participants and reemphasized Toyoda's strong commitment to quality.

In a more recent action again symbolizing his commitment to quality, Shoichiro Toyoda personally attended the November 9, 2004, Deming Prize ceremony at which Akira Takahashi (Toyota's former senior executive in charge of Total Quality Management) was awarded the individual Deming Prize.

The leader must use the effective methods available. In *Only the Paranoid Survive* (Grove99), Andrew Grove notes three areas in which a leader can affect his organization:

- Promoting or replacing people: For example, over a few years perhaps half of the executives may be changed
- Allocation of resources: For example, a leader decides about opening new branch offices, closing existing branch offices, starting new production lines, and so on.
- Use of the leader's personal time: For example, what the leader attends or doesn't attend, how much time the leader allocates to his or her own learning, and the like have important meaning for the company.

Grove says that if you do not change the executives, you cannot change anything. When Teradyne established its TQM program, CEO Alex d'Arbeloff moved one of his most promising young managers from heading the U.S. sales force to the staff position of corporate quality officer. After about 18 months this manager was rotated back into a high-level line management role, and another promising young manager was named corporate quality officer. Over a decade, Teradyne filled its top management ranks with people who had once served as corporate quality officer and thus firmly changed the management view to one where quality and

the methods of producing quality were part of the corporate culture. Later, for Teradyne's Aurora project (page 192), d'Arbeloff selected one of his most valuable and respected engineers to lead the project. In addition to using managers to help change the corporate culture and practice, such personnel assignments also show how serious d'Arbeloff was about what he was trying to accomplish.

Also for Teradyne's Aurora project (page 192), Alex d'Arbeloff showed his determination to start a new product line by placing the new activity in a location apart from Teradyne's existing factory.

The symbolic meaning of the redeployment of the leader's personal time is of incalculable value: How the leader spends his or her time is closely watched by the rest of the company, and actions speak louder than words. The leader's calendar can become his or her most important strategic tool. Alex d'Arbeloff suggests that a CEO should spend 20 percent of his or her time creating something completely new, and d'Arbeloff himself always allocated this percentage of his time to new activities — introducing TQM in 1990, starting the Aurora project in 1993, and so on.

A leader needs to have appropriate character. A leader must illustrate consistency and integrity. The leader should:

- avoid ambiguity
- not hedge risks
- not go around in circles

The leader needs to show consistency of thought, word, and behavior with one aother and over time.

A leader also needs to be open to learning new things. For instance, Ray Stata, founder of Analog Devices and cofounder of the Center for Quality of Management (CQM), was a motivating force in learning about TQM, studying the methods of conversation, and studying the methods of leadership.

A leader who is a role model also needs to show self-control. Such control can range from not losing his or her temper or panicking to not writing nasty memos to keeping physically fit to doing something hard and lonely. If a leader cannot control himself or herself, it will be difficult for the followers to accept the leader, and the leader will not be able to lead.

Finally, it is not sufficient just to have integrity of thoughts, words, and deeds at work. An effective leader can't pretend at work and be someone else outside of work. To function as a role model, the leader must unite his or her way of life with the management direction he or she desires.

4.3 Principle 5

Principle 5. The quick establishment of new *physical*, *organizational*, and *behavioral systems* is essential for successful transformation.

We saw examples of the application of principle in the Humanitas and ZIN case studies of Chapter 3 and in the FAVI and SOL case studies earlier in this chapter. For example, Humanitas made the physical change of building a new mixed-use building, FAVI made the organizational change of establishing minifactories to foster intimate relationships with customers, and at SOL everyone shared a common office space. Table 4-1 summarizes some of the physical, organizational, and behavioral changes at Humanitas, ZIN, FAVI, and SOL.

Table 4-1. Principle 5 at Humanitas, ZIN, FAVI, and SOL

	Physical	Organizational	Behavioral
Humanitas	New mixed-use building	Involving the extended family Moving from care to housing	Use-it-or-lose-it philosophy Yes-culture
Zin	New building combined with old church	Renewal of historic identity combined with adoption of modern secular approaches	Helping people to love themselves
FAVI	Minifactories	Close relationship with customers Uniting R&D and manufacturing	Trust by CEO
SOL	SOL City	Intensive feedback from customers	Self-directed work teams Trust by CEO

Common language

The physical and organizational changes a visionary leader makes are likely to be very situational. The same is true of many behavioral changes. However, one kind of behavioral change is very often useful and all too often not utilized: the adoption and use of a common language.

When leaders are trying to carry out change in an organization, experience has shown that promotion of a common language to talk about the change can help. For instance, we have often observed that in companies that were not focused on customers, adopting the words "customer focus" naturally led employees to become more aware of the fact that they had customers (including internal customers) and that all customers have needs. In general, moving toward the innovative goal that is inherent in a breakthrough effort causes a disconnect with the existing corporate culture; and efforts to spread a new set of words — a new common language — throughout the organization can help bridge the gap of the disconnect.

Spencer Johnson's best-selling book *Who Moved My Cheese?* (Johnson98) creates a vision of change. The book argues that change always happens and that individuals must not fear it but must adapt as soon as possible, changing past behavior and moving in the direction of the change. *Who Moved My Cheese?* was translated into Japanese, and between November 2000 and January 2001 it sold 900,000 copies (roughly 15,000 copies per business day). A large part of the reason this 94-page parable of change sold so many copies in Japan was because companies distributed the book to employees to provide a common language of change. (A longtime best-seller in the United States, the book also has been used in many U.S. companies and other institutions.)

Adopting a common language for talking about change is powerful in several ways. First, learning the new vocabulary lets people see what they didn't see before, as in the example of people's not thinking about having customers until they begin to talk about "customers," at which point it becomes obvious that in a series of manufacturing processes each step is the customer of the previous step.

Next, a common language helps bridge cultural differences within an organization and thus creates a readiness for transformation. For

instance, in a multinational company, divisions in different countries may have different national or business cultures that seem (and may well be) unique. But this uniqueness may be used as an excuse: "We are unique, so the parent company's goals don't apply to us and we can't change." There are also cultural differences among functional areas of a company that can be as different as national differences. For instance, the accounting people naturally think in terms of profitability and break-even points and live in a world where it is assumed that providing a return on investment is the paramount goal of the business. On the other hand, the research and development people naturally think in terms of creativity and innovation and live in a world where it is assumed that providing the next technology breakthrough is of paramount importance. Adopting a common language of "interacting causal loops" could help both functions see how they fit together to achieve the goals of the overall organization.

The common language also can be couched in a way that diffuses the desired direction of change and goals. For instance, Humanitas talks about the "yes-culture"; this helps employees remember to be responsive to clients as well as to be willing to think innovatively.

Finally, the common language can be publicized as part of the branding of the organization. The "yes-culture" of Humanitas is prominently mentioned in Humanitas's marketing materials.

Training and education activities have long been used to convey a common language to people in a company. For instance, the training of quality control circles in Japan starting in the early 1960s conveyed a common language of "plan-do-check-act," "QC stories" (the seven steps), and "market-in/product-out" throughout companies and across industries in Japan. More recently, in 1987 in Hungary, there was a desire to introduce Total Quality Management to industry as part of an effort to improve the country's planned economy. However, at the time they had no word for "management" in general — only words like "operation," "manipulation," and "control." Therefore, the training in TQM used the English word for "management," and that provided a new element of common language across industry that helped spread the desired changes.

In addition to training, an organization can simply use repetition to help create a common language. Every time the leader speaks, he or she can repeat a key phrase, such as "yes-culture" at Humanitas. The outside-in communication technique (see page 69) can also be used to bring the desired common language to a business, as we believe Andy Grove brought a sense of urgency to Intel through publication of his book *Only the Paranoid Survive*.

4.4 Reflection

The CEO philosophies and management systems of FAVI (section 4.1) and SOL (section 4.2) have certain similarities, starting with a new work concept illustrated in a symbolic way in each case (FAVI's tree and SOL City) and continuing with similar models of management.

Also, in both the FAVI and SOL cases, the CEO works from the border of the organization, where he or she can work equally well either inside or outside the organization, rather than in a position centered at the top of a traditional hierarchical pyramid. FAVI CEO Zorbist suggests that a CEO should be like a football coach — not in the middle of the field but standing at the sidelines where he can see signals for change both inside and outside of the team. Zorbist spends 20 percent of his time outside his organization, including attending outside conferences a couple of times a month and participating in an outside meeting once a week.

In both cases the CEO also works up and down the ladder of abstraction, from the conceptual to the concrete level, in response to signals for change.[9] Both CEOs grapple conceptually with defining the real objective of the organization — with answering the what-does-life-mean sort of question. At the concrete level, FAVI implemented the 5S method, and SOL has a process for going to the customer to fix the problem.

There are also some contrasts between the ways FAVI and SOL handle things. The connection to customers at FAVI is through the customer relations person, whereas workers on a SOL assignment meet directly with customers. FAVI concentrates on rapid technical change, while SOL addresses change with specific improvements in the workplace.

Figure 4-11 relates the concepts we've discussed in this chapter to the material in the previous chapter (see Figure 3-6, page 72) and points to where we are going in Chapter 5.

As we saw in the FAVI and SOL case studies, the visionary leaders of those businesses used the vision and commitment they developed applying principles 1 and 2 to initiate change. The case studies of FAVI and SOL also described the new business systems that FAVI and SOL's leaders created, and we will return to a model for what they did in the next chapter.

Because of the way we built up the presentation of the principles and case studies in the previous chapter and this chapter, we have not yet highlighted the application of some of principles 1–5 in some of the case studies. A complete set of summary tables are included in section 5.4, beginning on page 120.

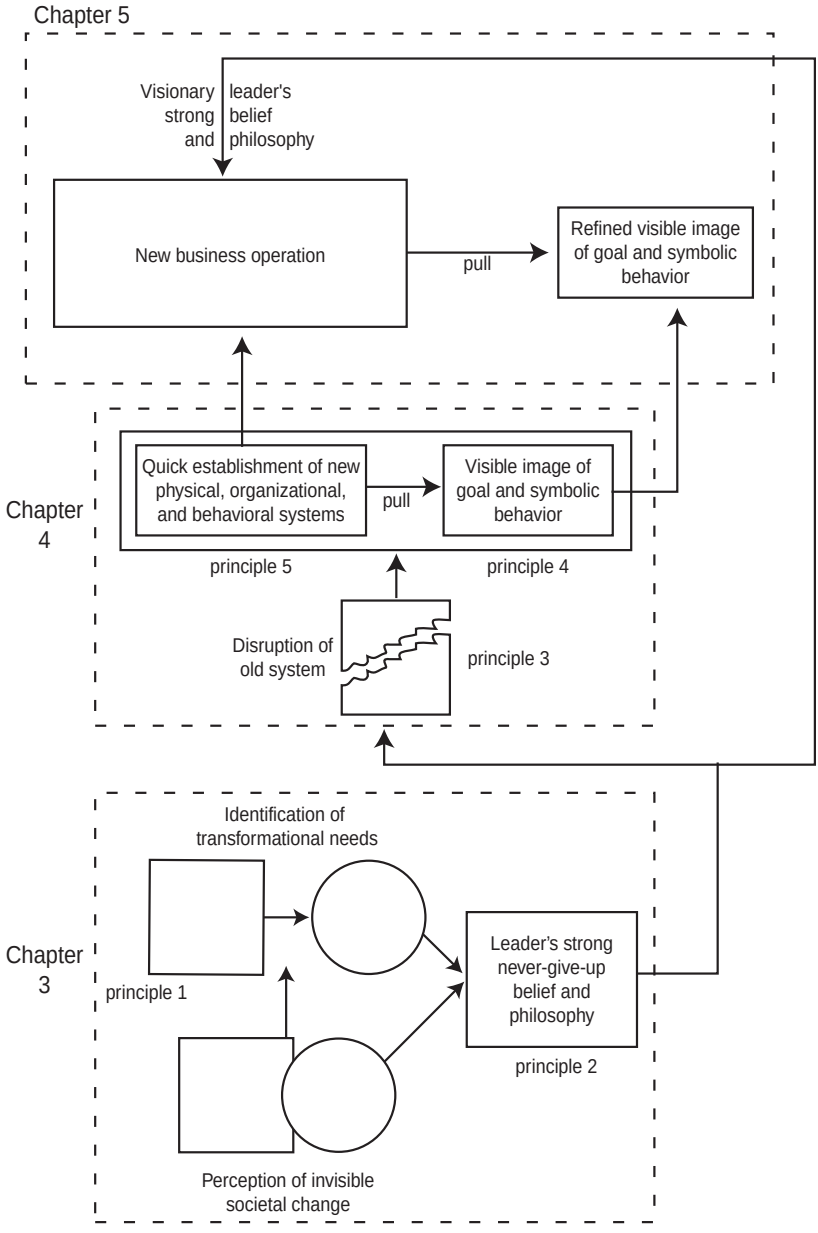


Figure 4-11. Principles 3–5 in context.

Chapter 5

Build New Business

This chapter addresses the third task shown in Figure 11 on page 44 — creation of a new business process. We will look at two case studies that point up the crucial importance of real change agents (principle 6); innovative feedback systems (principle 7); and a daily operation system incorporating a new work structure, a new understanding of human capabilities, and improvement activities (principle 8).

5.1 Maeda Corporation and principle 6

Principle 6. *Real change leaders* are necessary to enable transformation.

The CEO alone cannot achieve breakthrough. There must also be real change leaders within the organization — people who help the CEO diffuse the desired change even when the CEO is not present.

Matabee Maeda and Kazuie Yamada

The case study of the Maeda Corporation provides a particularly good example of principle 6. Supporting the visionary leader, Dr. Matabee Maeda, was a real change leader, Dr. Kazuie Yamada.

At the time we are describing, Dr. Matabee Maeda was the owner, chairman, and CEO of Maeda Corporation, one of the leading Japanese engineering and construction companies. He did not have a technical background; rather, he was a liberal arts graduate.[1]

In late 1989, Maeda corporation had a project to construct a residential skyscraper in Sapporo. Sapporo is a cold place in winter, and mixing,

pouring, and setting high-strength concrete is more difficult when it is cold. The Maeda engineers and concrete experts succeeded in conquering the problems, however. At a party at Dr. Maeda's house to celebrate getting the go-ahead for an important project and over drinks, they proudly described to Dr. Maeda the problems with the Sapporo project and their successful effort. Part of the problem had to do with getting the concrete compounds and water to mix well in cold weather. Dr. Maeda, who makes Japanese noodles as a hobby, asked the engineers if it would help to mix the concrete the way dough is mixed for Japanese noodles, but the engineers didn't think his idea was relevant. Later, at the senior executive board meeting, Dr. Maeda saw a video about a newly developed high-performance concrete known as self-compacting concrete; this product had revolutionary performance but required more careful mixing than conventional concrete. Again Dr. Maeda wondered if the mixing method used for Japanese noodle dough might be applied.

Dr. Maeda likes to serve guests noodles he has made himself. Noodle-making technique involves mixing the dough and rolling it in certain ways. Regarding noodles and concrete, he thought:

> Excellent noodles come from excellent technique of kneading. Japanese noodle experts have applied their genius to developing masterful techniques of mixing. In our business of construction, concrete requires mixing. But the principle used in concrete mixing is limited to stirring; it does not involve a kneading action. The kneading technique used in making noodles in Japan since long ago can be applied to mixing concrete.[2]

The noodle-making process involves rolling the dough in one direction, folding in half, rolling in the other direction, and so forth, as shown in Figure 5-1. No stirring is involved once the components of the dough have initially been mixed together.

With strong support from only one other person, Kazuie Yamada, Dr. Maeda had a prototype concrete mixing machine built. Dr. Maeda and Dr. Yamada are pictured in Figure 5-2. The prototype machine (photo A in Figure 5-3) showed good potential to Dr. Maeda.

Next, Dr. Maeda thought he saw an opportunity for a joint project with two other companies to develop an operational machine. However, various prototypes failed, and the effort met strong resistance, especially

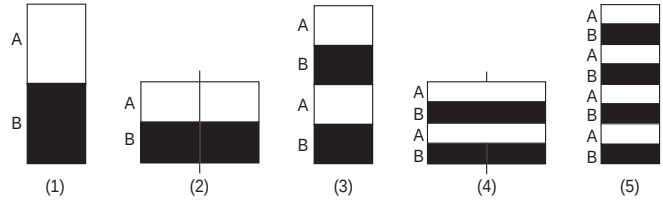


Figure 5-1. Japanese noodle kneading. (Source: Maeda01, p. 4.)

Figure 5-2. Dr. Maeda demonstrates his noodle-making hobby; at right is Dr. Yamada. (Source: Maeda01, p. 4.)

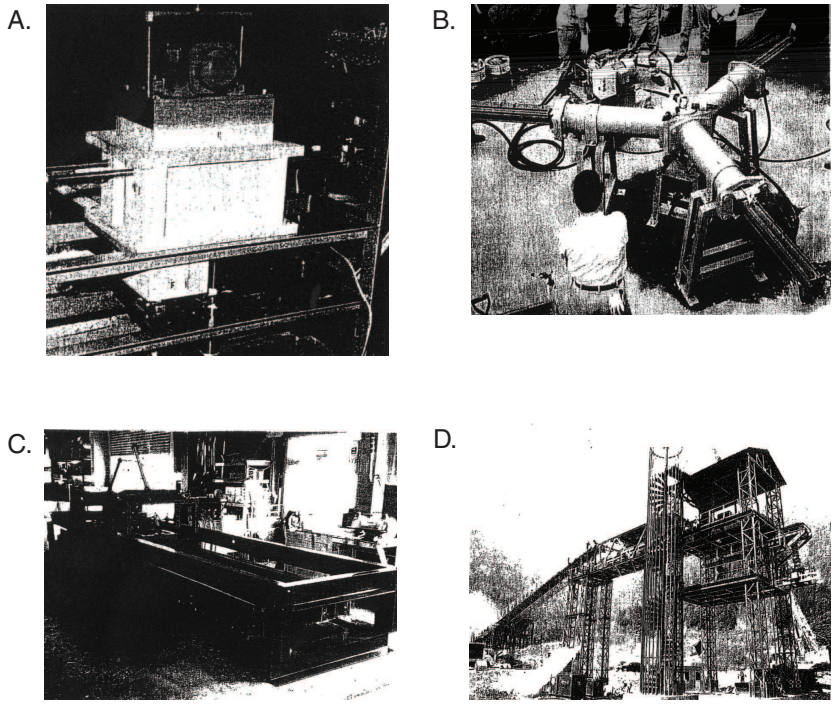


Figure 5-3. Series of concrete mixing machines using Japanese noodle kneading principle. (Source: Shiba01, p. 628.)

from experts in concrete technology — that is, from people with PhD degrees in concrete material. All the experts tried to persuade Dr. Maeda not to develop a noodle-type concrete mixing machine.

Dr. Maeda described the resistance as follows:

> When I proposed using noodle-mixing techniques to mix concrete, almost all the experts in my company laughed off my idea. This was the start of a long and difficult journey that exposed me to considerable scorn and derision. At the time I was president. The project was characterized as the president's folly. However, my rebellious spirit never weakened. (Maeda01, p. 5–6)

Dr. Maeda did not give up. He was determined to go on even without external partners. He did a laboratory experiment that appeared to work, and he demanded that an internal team be created to work on the

problem. Kazuie Yamada was on the team together with three others who opposed undertaking the effort. Led by Dr. Yamada, the team built a series of prototypes (including those shown in photos B and C in Figure 5-3). Finally, the team developed a new type of mixer and focused on actual use on construction sites with "development partners"; the result was the development of an operational concrete-mixing machine using the Japanese noodle principle. The final machine is in practical use and is known as an M-Y Mixer (for Maeda-Yamada Mixer). In recognition of his innovation and of his extraordinary documentation of the innovation process, Dr. Maeda was awarded a doctorate in engineering from the University of Tokyo.

Dr. Maeda's work did not stop after the several development iterations that finally led to a working mixer that used the Japanese noodle principle. His next goal was to diffuse the new mixing technology for other uses, such as clay mixing or even noodle mixing. Every type of business, of course, resists such disruptive technology — and in this case it is interesting to note that the Japanese noodle industry remains committed to the traditional hand mixing method.

Dr. Maeda summarizes, "Decisions in organizations tend to place their emphasis on feasibility — possibility of realization. But there is no breakthrough if you just fulfill what seems feasible." Dr. Maeda suggests that a young engineer could never develop a good idea like the Japanese-noodle-principle concrete-mixing machine in the face of organizational resistance. Even Dr. Maeda as chairman could barely push the idea through. Consequently, he established small informal school within Maeda Corporation to develop the innovative ideas of young employees that the organization would typically kill. He calls this the "Maeda incubator of venture business."

Real change leaders

Following Jon R. Katzenbach (Katzenbach95), we use the term "real change leaders" for people like Dr. Yamada — individuals who make the implementation of transformation happen, so the transformational concept does not remain merely another wild idea on the part of the visionary leader.

Katzenbach describes *seven characteristics of real change leaders* (Katzenbach95, p. 13):

1. commitment to a better way
2. courage to challenge existing power bases and norms
3. personal initiative to go beyond defined boundaries
4. motivation of themselves and others
5. caring about how people are treated and enabling others to perform
6. staying undercover
7. a sense of humor about themselves and their situations

So far we have only hinted at Dr. Yamada's role as real change leader in the Maeda case study. With CEO Maeda, Dr. Yamada had to face the disagreement of the rest of the organization and solve many technical problems (Maeda01). In fact, while Dr. Maeda had the mental breakthrough of imagining a new way of mixing concrete based on the technique of kneading Japanese noodles, it was Dr. Yamada who had the mental breakthrough that led to a practical adaptation of noodle-dough folding in industrial-size concrete-mixing equipment. The breakthrough

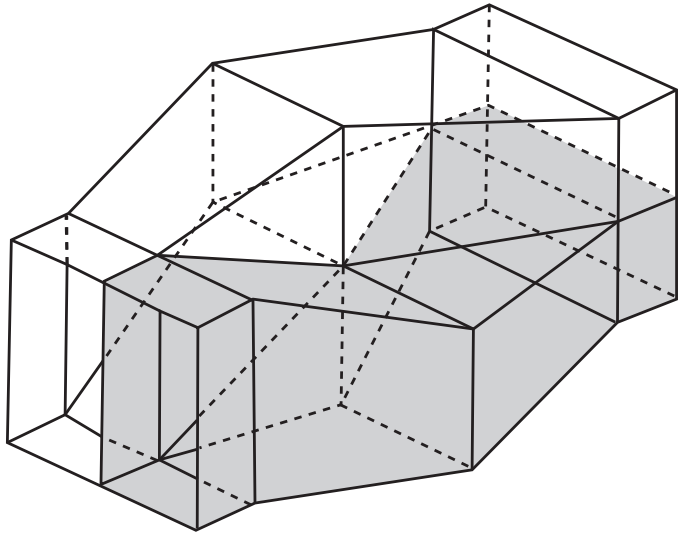


Figure 5-4. One segment of a noodle-style concrete-mixing machine. (Source: Maeda01, p. 6.)

that allowed noodle-like folding as a concrete mixing process was geometric in nature. As can be seen in the schematic diagram in Figure 5-4, partially mixed concrete falling into the two openings at one end of the segment is rotated 90 degrees by the time it comes out the other end of the box. A sequence of several of the units diagrammed in Figure 5-4, each unit rotating the concrete going through it plus or minus 90 degrees, allows "folding" of the concrete similar to the folding pattern of Japanese noodles as shown in Figure 5-1. During an informal reception at MIT on August 9, 2001, Dr. Yamada told us and our students that he abstracted the idea for such a geometric rotation from the way his two dogs (which were squarish in shape) looked when side by side.

There needs to be a strong emotional tie between CEO and a real change leader: not a relationship of boss and subordinate but rather a partnership — a human tie. When all of the people in the Maeda Corporation were against Dr. Maeda's desire to build a concrete mixer based on his insight about folding Japanese noodles, people were against Dr. Yamada too. They called him a sycophant and a courtier. In reality, Dr. Yamada was a strong partner with Dr. Maeda, and Maeda would not have succeeded without Yamada.

Real change leaders, as Katzenbach portrays them (Katzenbach95, pp. 8–9), function as unique "linchpins" who make connections among:

- "top leadership aspirations (what are we trying to become?)"
- "workforce energy and productivity (how will we climb the mountain?)"
- "marketplace reality (what do our target customers truly seek, and what can and will our potential competitors do?)"

The four case studies of the previous two chapters all involved real change leaders; they are listed in Table 5-6 (page 128). And in Chapter 8 we will describe at some length the work of another real change leader, Mark Levine, as part of the Teradyne Aurora case study.

5.2 NIMS and principles 7 and 8

Principle 7. The leader creates an *innovative* system to provide *feedback from results*.

Principle 8. The leader creates a daily operation system that includes a new *work structure*, a new approach to *human capabilities*, and *improvement activities*.

Although the case of the NIMS division of NEC took place in the 1980s in Japan, we include it here because it is another excellent example of organizational transformation.[3] The story came from Kiyoshi Uchimaru, whom we were privileged to talk with at length on several occasions. Uchimaru and colleagues wrote *TQM for Technical Groups* (Uchimaru93) describing the efforts of NEC Integrated-circuit and Microcomputer Systems (NIMS) to implement TQM.[4]

Here then is the story of NIMS.[5] We go into it in considerable detail because it is one of the most profound yet underappreciated business breakthrough cases we know. This effort was led by the then president, Kiyoshi Uchimaru, who himself had decades of engineering management experience and who spent an exceptional amount of time himself on TQM diagnosis.

NIMS is a 1,000-person design subsidiary of NEC.[6] It started as a contract engineering shop with little capability for managing development. Uchimaru believed that NIMS needed to develop the highest level of self-sufficiency if it was to be viable in the long run — he saw a looming crisis. Consequently, he embarked on a path of TQM implementation, and in 1987 NIMS won the Deming Prize.

There are three ways to look at the NIMS story reported here. First, it can be seen as a story detailing the phase-in of a business improvement system: (1) orientation, (2) empowerment, and (3) alignment.

The management at NIMS began with orientation, but it became captivated by the concept of hoshin management as a companywide method of aligning activities.[7] Therefore, from the orientation phase, managers attempted to move directly to hoshin management and the alignment phase. Finding, however, that the NIMS staff did not have the necessary skill to work on companywide activities, the managers were

forced to go back to the empowerment phase to teach the basics of TQM. After some empowerment efforts, they tried alignment again — and were again forced to go back for more empowering skills. This cycle repeated several times until the staff had reached truly extraordinary levels of individual empowerment, after which the company finally succeeded in alignment. In effect, hoshin management became the tool NIMS used to deploy each year's improvement ideas and to systematize successful ideas.

Second, the NIMS story demonstrates the systematic development of skill in a creative engineering environment. We have all heard statements such as "These improvement methods might be applicable to manufacturing, but they cannot be applied to a creative task such as engineering." The feeling at NIMS was no different. The NIMS technical staff cited all the usual reasons why systematic improvement could not apply to them. However, Uchimaru makes the point that the history of science is itself a quality improvement story: Develop a theory and Plan how to test it, Do an empirical experiment, Check the result to see if the experiment confirmed the theory, and Act to publish (standardize) the result. In science this PDCA cycle continues as each new theory builds on — or corrects — a previously held theory.

As Uchimaru sees things, an engineer who thinks systematic improvement methods do not apply to technical activities must not understand either engineering or systematic improvement or both. Systematic improvement is the application of the scientific method to business: Pick an important problem, get the facts, analyze the facts, find the underlying truth, plan a method of improvement based on the underlying truth, systematically test the method to verify that it works, standardize the new method, and then cycle around again. Uchimaru also explains why the complexity of modern business and technology requires a teamwork approach rather than each engineer's "doing his own thing." In the case of NIMS, Uchimaru applied TQM both to the business of the company and to engineering methods.

Third, in the NIMS story we see managerial development arrived at through hoshin management. When the breakthrough methodologies described in this book are taught or explained, the first question from most managers is, "How will I have to change what I am doing?" The

NIMS case illustrates the evolution and development of the role of technical managers.

When Uchimaru and his colleagues started, they didn't see a clear path to successful TQM implementation for a technical group. They applied continuous improvement over many years, incrementally discovering methods that eventually produced dramatic improvements in NIMS design quality. During these repeated cycles, Uchimaru and his colleagues focused on two fundamental issues: (1) making the development process ever more visible and (2) inserting quality ever further upstream (that is, earlier in the design and development process). These two fundamental issues are represented by the horizontal and vertical axes of Figure 5-5.

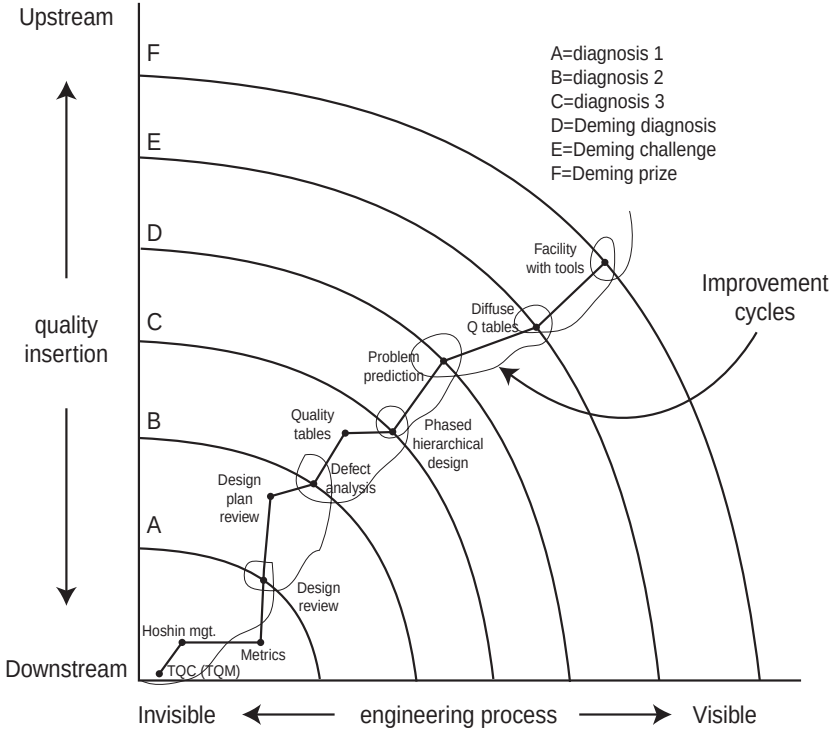


Figure 5-5. Stages in incremental TQM implementation at NIMS. Each interval (origin to A, A to B, etc.) represents approximately one year's time.

Like most companies, NIMS started in the lower left corner of Figure 5-5 with a nearly invisible development process and with quality insertion relatively far downstream (e.g., catching defects after products were shipped to customers). By the time NIMS won the Deming Prize, it had evolved a highly visible development process with quality inserted as far upstream as possible, as the upper right of the figure shows.[8] This didn't happen overnight. It took many years of what Uchimaru calls "trial and error." The grey looping line indicates the trial-and-error cycle repeated over many years. The tight loops represent the process of analyzing the results of the each trial, deciding on what to try next, and planning the next trial. The long arches represent the actual carrying out of each trial. The labeled dots between the straight line segments designate successive areas of improvement activity.

Let's look briefly at the successive improvement activities shown in Figure 5-5.

Because hoshin management is regarded as a pillar of TQM in Japan, NIMS immediately tried to implement the hoshin approach (see the first segment of the figure). However, hoshin management did not immediately produce results as good as NIMS had sought, and management was forced first to work on some other skills.

The next step in NIMS's implementation was to install some quality metrics. The goal was to make the development process more visible. The company discovered first that getting technical people to agree on a set of metrics, or even to agree that there should be metrics, took many months. But once the technical people had agreed on a small set of metrics, NIMS discovered that metrics alone didn't provide much improvement. In other words, it began to realize the need for focusing on process instead of results.

NIMS then tried to improve its development processes by initiating design reviews. We all know about design reviews, meetings in which experienced and skilled designers from around the company review a proposed design. This was an attempt to insert the quality farther upstream; that is, to find bugs while still in the design stage rather than implementing poor designs. This activity helped some, but not as much as NIMS hoped it would.

NIMS next figured out that if finding problems in the design farther upstream was good, then finding problems in the design *plan* farther upstream would be even better. Thus, the company initiated design plan reviews in which experienced managers and technologists from various areas reviewed development plans, looking for potential problems that could be corrected before the project got under way. Design plan reviews proved to be quite beneficial.

While the design and design plan reviews were proactive efforts to eliminate defects and other forms of waste, NIMS soon realized that it was not making good use of all of the data on defects — it was not using the data to eliminate root causes of defects, that is, to do reactive improvement. Thus, it changed its operating methods so that if defects were found, investigations would be undertaken to figure out at what earlier time the problem should have been detected and when the problem was actually created.

This process was called defect analysis (see Figure 5-6). By doing this analysis and shortening the two time intervals shown in the figure, NIMS made the development process clearer and also learned how to insert quality (or at least how to detect lack of quality) farther upstream.

Having concentrated early improvement activities on various quality assurance activities, NIMS then began to work on improving its product designs. First they began to use quality tables to capture customer-defined quality better. For a chosen project, NIMS determined product requirements and built a big quality table[9] to show how to achieve the

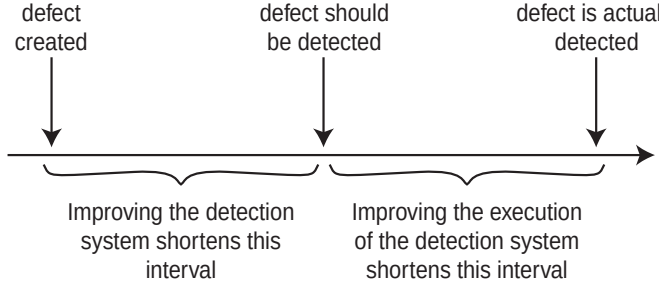


Figure 5-6. Defect analysis in the NIMS quality process.

requirements; but the table took so long to create and was so big that it was not useful. So NIMS reconsidered the customer requirements in light of which ones needed innovation (a small fraction) and which could be handled routinely (a large fraction). In other words, it learned to partition a development activity into parts requiring breakthrough improvement (e.g., invention of a new technology) and parts requiring incremental improvement (e.g., a small change to an existing module). NIMS's activities requiring breakthrough were called bottlenecks, and the necessary innovative activity became known as bottleneck engineering. The company tried using quality tables only for planning how to do the bottleneck engineering; this proved to be effective.

Once the customer requirements deployment system was made explicit, NIMS realized its design process was not very explicit. Thus, NIMS embarked on what it called phased hierarchical design. Of course, we all know about phase review systems for product development in which the development process is divided into five or six phases, each of which is several to many months long. NIMS divided these phases into much shorter subphases. This subdivision served two purposes. First, it provided many more instances of process visibility (e.g., clear interfaces, clear test procedures). And second, it permitted earlier feedback about problems. Making the process more visible allowed NIMS to understand which methods did and didn't work, helped teams of engineers to work together efficiently, provided standard models for successive steps in the process for which standard tools could be built, and enabled greater reuse of modules. NIMS's phased hierarchical design method also included a detailed mapping showing elements of the design and how each element was to be accomplished.

By this point NIMS had progressed significantly in making the process visible and in moving the quality insertion upstream. However, it had not progressed far enough. In particular, the ultimate source of defects is mistakes by engineers, and it was unclear how engineering managers should help engineers to improve their skill — "to become more professional," in Uchimaru's words. In his image of a "professional," Uchimaru did not mean someone who gets paid for doing something each day; rather, he meant the equivalent of a golf pro — someone who shoots par.

Uchimaru says (Uchimaru93) that any professional (at golf, in the game of go, or in intricate electrical circuit design design) has three characteristics:

- A strong grounding in theory and the ability to apply the theory practically.
- A large set of tools he or she knows how to use in different situations. Such tools have been acquired through experience (many turns of the improvement cycle mentioned above).
- A strong capability for analyzing failure: The professional understands why he or she made a mistake and learns from it.

The traditional route to professionalism involves years of study under the supervision of a master. In the engineering field, however, the method often used to teach engineers is the school of hard knocks. Companies hire engineering graduates from good schools and assign them to projects without much guidance on how to do good engineering. In fact, many engineering managers think their only jobs are to allocate staff and tasks and monitor results; managers often don't have any explicit system to develop better engineers. Uchimaru makes the point that engineering managers frequently use the notion that engineering is an individual art, learned through personal experience, as an excuse for why they can't do much to improve their engineers' abilities. However, Uchimaru says that if companies are to develop engineers who create fewer defects, engineering managers must become coaches who teach younger engineers professional skills.

At NIMS this recognition led to a system called problem prediction. In problem prediction, the subphases of phased hierarchical design are divided into still shorter phases, each a few days long. The engineering manager's job is to sit down regularly with each engineer and ask what the engineer is going to do in the next few days. Having heard the engineer's design plans, the manager asks the engineer to predict what might go wrong. Then the manager tells the engineer to go about his work. A few days later, the manager again sits down and asks the engineer to describe what went wrong that the engineer did and didn't predict as he designed what he just implemented. The manager then helps the engineer evaluate the quality of the design, because a junior engineer often is incapable

of judging whether a design is good. Through this problem prediction and coaching process, the engineering manager teaches other engineers to be professionals. Uchimaru says that a good manager must know the capabilities of his or her engineers well enough to accurately predict the areas in which they will have problems; then the manager can subtly guide the engineer so as to maximize the engineer's learning from the engineer's process of prediction and reflection.

In the last two phases of the NIMS story, managers spread the techniques (such as quality tables) and facility of tool use throughout the company. This space between each pair of concentric circles in Figure 5-5 (A, B, etc.) represents roughly a year's time. By iteratively improving and controlling its development process, NIMS used TQM as a learning system that eventually taught the company how to bring its development processes to the point where it had far better results than industry averages and won the Deming Prize. With each improvement cycle, NIMS made another quality improvement. Starting with relatively superficial changes, Uchimaru's firm gained skill to recognize and efficiently correct defects until eventually it was working at the profound level of improving the professionalism of its engineers. Uchimaru describes this as the "spiral up of craftsmanship."

Reviewing the NIMS case study, we can see parallels between the change models illustrated in Figures 4-4 and 4-7 (see pp. 81 and 87) and the model shown in Figure 5-7. Uchimaru's philosophy was to apply the continuous improvement techniques of the Plan-Do-Check-Act cycle and the 7 Steps for reactive improvement[10] in research and development. Uchimaru was motivated by a crisis — his business was unable to compete even though his customer was other parts of NEC. His mental breakthrough was to focus on making the process visible and looking for defects early. He revolutionized the new-design process by breaking the design process into much shorter times periods than is considered normal (another way of looking at finding defects early). Feedback came from metrics that were monitored, design reviews, design plan reviews, and defect analysis. The organizational changes were implemented using traditional Total Quality Control (known in the United States as Total Quality Management) methods, particularly hoshin management.[11] In

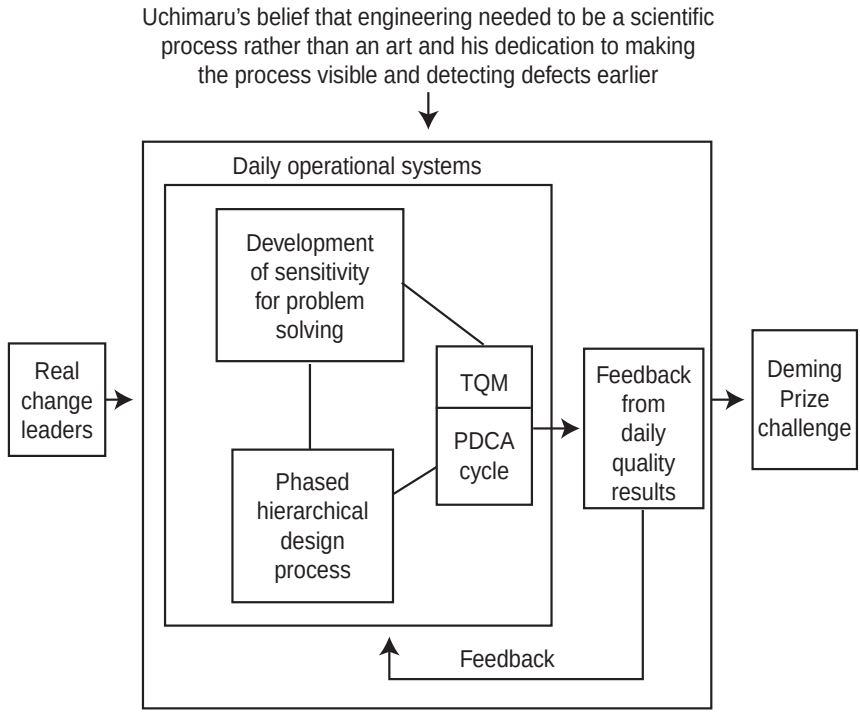


Figure 5-7. Model of organizational change at NIMS.

the end, successful change of the organization depended on developing a deep feeling for problem identification and avoidance in the NIMS engineers.

5.3 Summary model

Summarizing the FAVI, SOL, and NIMS management models shown in Figures 4-4, 4-7, and 5-7, we derive the more abstract model shown in Figure 5-8.[12] In Figure 5-8 the large outside box indicates the new business operation involving typical daily operational systems producing results and the results being fed back to modify the daily operations systems. The daily operational systems include the systems that produce the work, the activities designed to develop the people to better do the

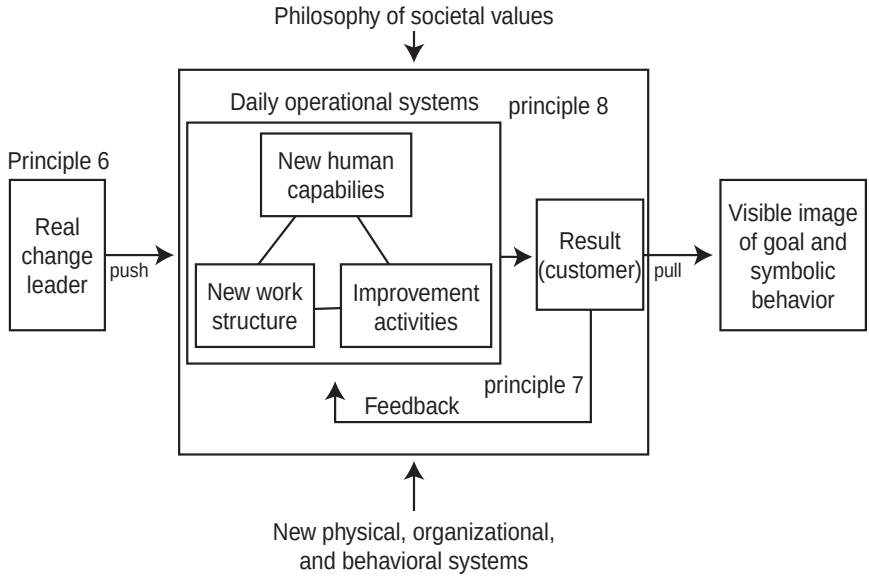


Figure 5-8. Building a new business.

work, and the activities aimed at getting better at doing improvement work.

Surrounding the new-business-operation box are four forces that promote change. Two of the forces are intangible: The new business operation is influenced by the philosophy of societal values the visionary leader has developed and espouses, and it has a target to aim for in terms of the visible image of the goal. However, such intangible forces are insufficient to ensure change. There also must be physical, organizational, and behavioral systems that constrain and channel the new business evolution as well as someone (the real change leader or leaders) to drive the change forward.

In each of the six cases we have reviewed in Chapters 3–5, mechanisms were put in place to encourage changes in behavior consistent with the desired direction of transformation. Encouraging change has a complication, however. We want changes in behavior to happen; thus, "force the change" might be a better phrase than "encourage the change." But breakthrough is a process of creation. Applying the four forces around

the new-business-operation box in some programmatic or enforced way might seem artificial and might kill the possibilities for creativity. Rather, in at least some cases, the four forces may need to be exerted more or less implicitly and subtly integrated in the movement toward the desired breakthrough. For instance, the goal should not take the form of an explicit operational target; rather, it should be a guide to the behavior of people. Top-down orders and instructions from the CEO are unlikely to enhance creativity; the leader is better off modeling the desired behavior and showing a quality of personal and business character that is appropriate to the desired change. Real change leaders serve to accelerate, not necessarily enforce, change and provide another sort of role model for the organization. The common language that is a part of a new behavioral system is not a set of declared standards; rather, it helps create an environment for acceptance of movement in the desired direction.

Breakthrough is achieved when leadership succeeds in engaging the energies and emotions of the employees, although it takes work and time to overcome their resistance to change. Trying to force or manipulate the employees to move in the desired direction will likely backfire. For example, when Shoji Shiba visited Hewlett Packard's headquarters in 2001, he heard a senior executive say

> We do not expect that you will work your whole life at HP (of course, if you stay at HP for life it will be wonderful) . . . If you have strong passion to fulfill what HP is going to do, you can utilize HP as a place to realize your dream.

The elements shown in Figure 5-8 are the means to create a "dream team" capable of achieving the desired breakthrough by creating a new relationship among the people within the organization.

Figure 5-9 shows the elements of Figure 5-8 embedded in the overall context of applying the eight principles of visionary leadership.

5.4 Tables relating the eight principles to six case studies

Tables 5-1 through 5-6 note the application of the eight principles of visionary leadership in the six case studies we have presented in detail in Chapters 3–5. We encourage you to reread the case studies as you study

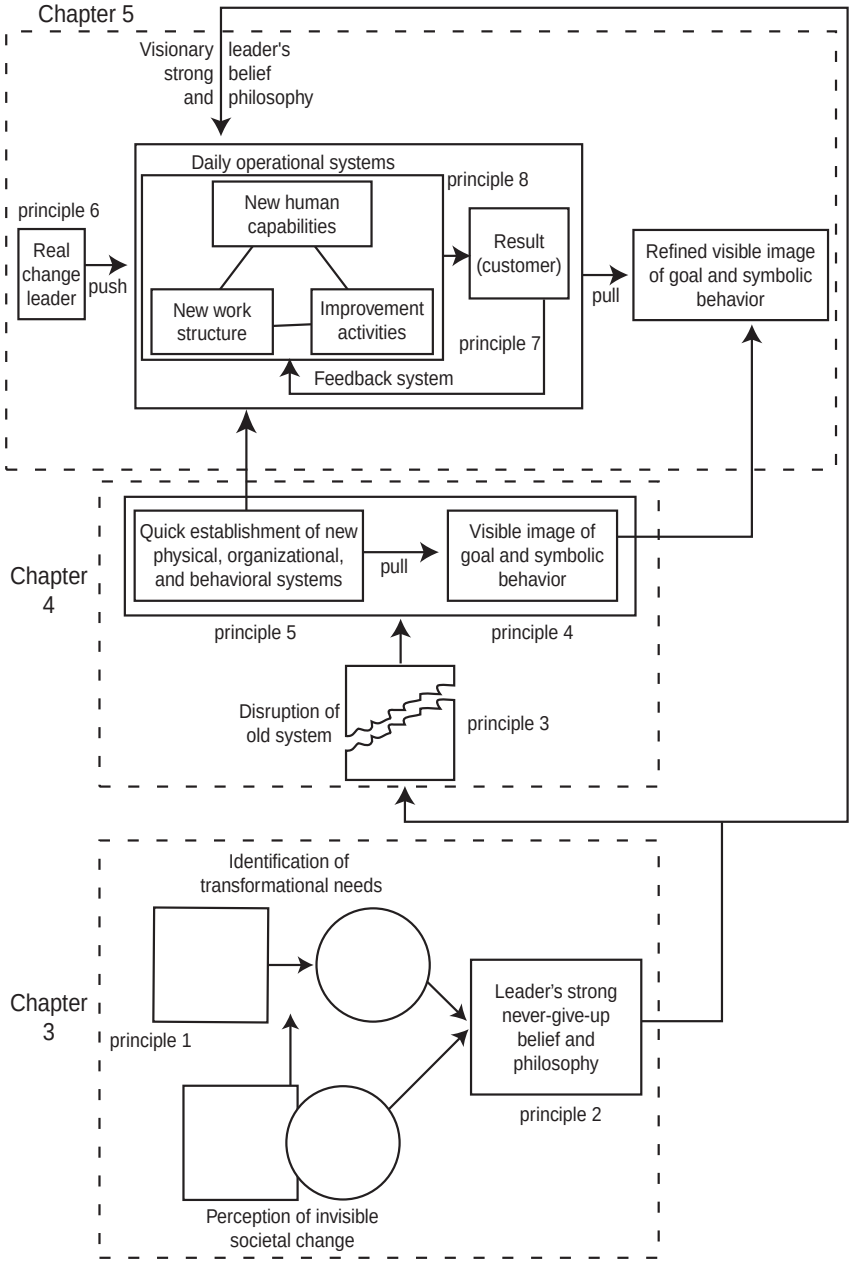


Figure 5-9. The visionary leader's path of transformation; incorporating the key elements of principles 1 through 8.

these tables. Obviously, some actions in a case study address more than one principle, and in some cases the actions of the CEO may have only slightly applied one or two of the principles.

Table 5-1. Examples of principle 1

	Perception of change in societal values	Outside point of view	Onsite observation
Humanitas	Change in emphasis from medical code to human happiness	Becker was headhunted from outside Humanitas.	Becker had a gut understanding of the "misery island" state of elder care.
ZIN	Rediscovery of mercy as core value and identity	Brother Wim had a strong historical perspective, had gone to university, and knew the attractions outside the order.	Brother Wim was deeply involved for decades in the affairs and problems of the order.
FAVI	Change from control (because people are bad) to trust that people are good	Zobrist had not developed FAVI's management system and was dropped in by helicopter to replace the retiring insider CEO.	Zobrist spent four months observing before taking over as CEO.
SOL	Transition from traditional work style to freedom style	Joronen was against the family's traditional management approach.	Joronen had observed the business closely daily from childhood.
Maeda	New consciousness of the problem of mixing high-performance concrete in cold regions such as Hokkaido province	Dr. Maeda was a liberal arts graduate, not an engineer; he was an outsider in the world of concrete engineering.	Dr. Maeda grew up around the family-owned Maeda Corporation and had worked extensively with the company; thus, he knew the company very well.
NIMS	Shift from engineering as art to engineering as a visible, scientific process	Uchimaru was appointed CEO of NIMS from elsewhere in NEC and came with a manufacturing rather than engineering operating background.	Uchimaru saw the daily defects and delays of products and services.

Table 5-2. Examples of principle 2

	Strong never-give-up committment	**Outside-in communications**
Humanitas	Becker persevered in the face of strong resistance from medical professionals and despite restaurant losses.	Becker gave journalists stories of his organization's problems and regularly appeared on TV.
ZIN	Brother Wim had long served in the senior position in the order and could have retired; instead, he started the new mercy activity.	Brother Wim advertised in newspapers and on TV to recruit new brothers; this revolutionary action conveyed a strong message back to the organization.
FAVI	Zobrist was determined that FAVI, like a tree, would stay in Hallencourt.	Zobrist frequently appeared in the mass media and at public presentations.
SOL	Joronen started SOL on her own initiative.	Joronen frequently gave public presentations and appeared in the mass media.
Maeda	Dr. Maeda continued in the face of broad internal criticism about the "president's folly" and in spite of at least three or four failures to develop a noodle-method-based concrete mixer.	With the aid of an outside advisor, Dr. Maeda presented his innovative idea for concrete mixing to an international conference in the concrete field; this, in turn, resulted in an invitation to another conference, and this external validation had a strong impact on people back within the corporation and also energized Maeda himself.
NIMS	Uchimaru put NIMS through years of PDCA cycles despite resistance from engineers and severe comments from outside counselors.	NIMS's challenge of the Deming prize brought with it outside counselors and critiques.

Table 5-3. Examples of principle 3

	Symbolic disruption of traditional systems through top-down efforts to create chaos
Humanitas	Becker stopped hiring consultants, let 2 in 10 health care professionals leave, destroyed an old-style building, banned white uniforms for health care people, disclosed all business results, and called residents “clients” instead of “patients.”
ZIN	Brother Wim combined an old church with a modern building in a prize-winning architecture combination and hired a layman to direct the new business, who in turn used outside consultants—a big break with the traditional way of management in a closed religious order.
FAVI	Zorbist abolished the attendance system, stopped paying production premiums, disclosed all business results, and bricked up the CEO’s office window.
SOL	Joronen created SOL City as a showcase, abolished fixed desks for people in the office, kept the office open 24x365; CEO Joronen herself had no office, no secretary, and no company car.
Maeda	Maeda acted in a way not typical of a Japanese CEO’s behavior by continuing when almost all his engineers thought his efforts were folly.
NIMS	Uchimaru abandoned the traditional engineering approach based on gut feel.

Table 5-4. Examples of principle 4

	Visible image	**Leader's symbolic behavior**
Humanitas	Mixed-use building with colorfully painted walls and ceilings and many activities typical of a village main street	Becker always speaks in terms of surprising, sometimes shocking, examples to illustrate the importance of client happiness in addition to health care; e.g., "have five cats in a room," "a beer a day keeps the doctor away," etc.
ZIN	Church with painting of "Seven Works of Mercy" and cemetery of the brothers indicating a focus on the spiritual	Brother Wim personally lived in a traditional religious community residential situation near the modern building and church, thus demonstrating a continuing spiritual commitment to the vocation of mercy as opposed to a commercial intent.
FAVI	Tree-money-love illustration	Zobrist blocked up the window of his top-floor office from which he could observe the whole factory.
SOL	SOL City	CEO Joronen has no executive perks, not even an office, and she always wears yellow.
Maeda	Dr. Maeda's international presentations aimed at focusing attention on his innovative mixer development efforts	Maeda, a busy CEO, dedicated much of his own time to the innovative mixer project.
NIMS	Challenge of Deming Prize	Uchimaru spent spent large amounts of time doing hoshin diagnosis in order to diffuse TQM practices.

Table 5-5. Examples of principle 5

	Physical systems	Organizational systems	Behavioral systems
Humanitas	Becker and his organization built several new mixed-use buildings.	Humanitas moved from care to housing in an extended family setting.	The yes-culture and use-it-or-lose-it philosophy guide behavior at Humanitas.
ZIN	The new building provided components of environmental context consistent with the new mission of mercy applied to a conference center setting.	ZIN created an organization including both lay people and brothers.	Practicing the "new mercy" is the job of everyone at ZIN.
FAVI	The unlocked storage room, removal of time clocks, clean and painted factory, and physically separate minifactories within same building all were new.	FAVI's new organization was seamless from customers to R&D to production to postdelivery service.	FAVI eliminated unneeded meetings in favor of worker empowerment, and adopted the goal of intimate relations with customers.
SOL	The SOL City office layout was emblematic of SOL's transformation.	Self-directed work teams defined the SOL organization.	SOL provided great personal freedom for employees.
Maeda	The prototype machines themselves were a physical manifestation.	Maeda gradually expanded his group of collaborators from Dr. Yamada to the project team to joint work with outside entities; also he established the Maeda school.	The new breakthrough spirit and behavior is taught by the Maeda school.
NIMS	Many parts of the new development process had physical manifestations.	TQM infrastructure organization was created.	Uchimaru advocated basing actions on facts derived using TQM methods.

Table 5-6. Examples of principles 6, 7, and 8

	Principle 6: Real change leaders	**Principle 7: Innovative feedback system**	**Principle 8: Daily operations system**
Humanitas	Managers of the individual apartment complexes and some head office managers provide strong support to Dr. Becker.	Moments of truth with clients provided feedback.	Becker established a flat organization utilizing outside volunteers.
ZIN	The director of the ZIN center provided a business complement to Brother Wim.	Moments of truth with seminar participants provided feedback.	Outside experts complemented the work of the dedicated brothers.
FAVI	The change leaders included the chiefs of the minifactories, the commercial person who interfaced among the customers, minifactories and R&D, and the R&D leaders.	Direct, close relationships among customers, mini-factories, and R&D; the customer relations person is key to making this feedback system work.	Integrated R&D and minifactories let FAVI constantly explore outside information.
SOL	Leaders of the self-directed work teams and the head office managers all supported change.	Five types of customer feedback are used.	Highly trained work teams were self-directed.
Maeda	Dr. Yamada stood by Dr. Maeda in implementing change.	Testing of the prototype concrete mixers in real business situations gave feedback.	M-Y Mixer is in daily use in Maeda's business, and the Maeda school develops a new generation of employees with a breakthrough mentality.
NIMS	TQM facilitators and some line managers strongly supported Mr. Uchimaru and developed the hierarchical design methods.	Feedback was obtained through the PDCA cycle in daily work, the hoshin planning and review process, and diagnosis of the TQM system by the Deming committee.	Explicit engineering design and development processes, TQM practices, and problem-sensing practices were developed.

Part III: Skills and Capabilities

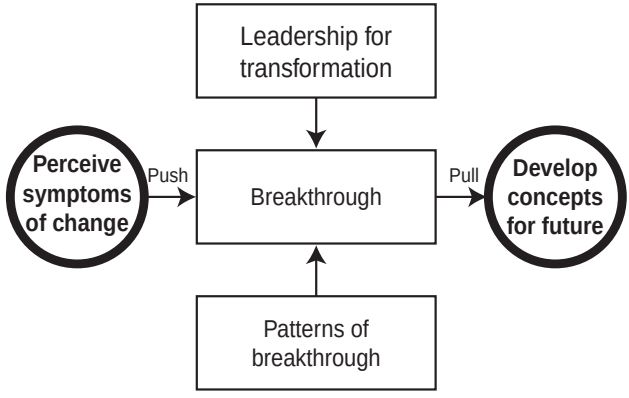


Figure III. Individual leadership skills.

Part III relates to individual leadership skills — perceiving symptoms of change (Chapter 6) and developing concepts for the future (Chapter 7). These techniques are crucial to the application of Principles 1 and 2, described in Chapter 3, as part of the overall breakthrough path shown in Figure 5-9 on page 121.

Chapter 6

Perceiving Change through Image Data

Before a leader can move an organization toward a breakthrough, the leader first has to perceive a possible opportunity and envision a possible concept for the future, as shown on the horizontal axis of Figure III on the preceding page. This and the next chapter deal with these two challenges. In this chapter we'll see how leaders can build their perceptive powers by using image data effectively.

6.1 Intuitive observation

In *Only the Paranoid Survive* (Grove99), Andrew Grove says about perceiving the symptoms of change, "There simply is no surefire formula by which you can decide if something is signal or noise" (p. 102).[1] The symptoms of important technological, economic, social, or cultural change can be hard to perceive. The available data are in the past, while much of the change may still be in the future. It is not possible to rely on the rational extrapolation of past data. Rather, one must turn to anecdotal observations and instincts. Yet great leaders somehow have a genius for such observation that lets them move their organizations in directions that are necessary to deal with the change.

Look at the case of Louis Gerstner when he took over as CEO of IBM. Recalling his first meeting with members of the IBM team, Gerstner recounted:

> I will never forget my first impression. It reminded me of a government office — long, quiet corridor after long, quiet corridor of closed offices (quiet that was broken only by the presence of almost blindingly bright orange carpeting). There was not a single indication

> in the artwork or other display that this was a computer company. There was no computer in the CEO's office.
>
> I was ushered into a large conference room to meet with the Corporate Management Board — roughly the top fifty people in the company. I don't remember what the women wore, but it was very obvious that all the men in the room were wearing white shirts, except me. Mine was blue, a major departure for an IBM executive! (Weeks later at a meeting of the same group, I showed up in a white shirt and found everyone else wearing other colors.) (Gerstner03, pp. 21–22.)

In the case of a change such as Gerstner was about to impose on IBM, an important question is in what respects the prior culture will be an obstacle to the desired change. The answer to this question is unlikely to be explicit; the answer will likely be based on what is intangible and unknown.

In our reading of this case, Gerstner saw what was visible ("long, quiet corridor") and, by negative inference, what did not exist (no "indication [that] this was a computer company," "no computer in the CEO's office"). He could visibly see the IBM norm ("white shirts"), and he observed the intangible IBM copy-the-leader style ("wearing [nonwhite] colors" at the next meeting because Gerstner had worn a blue shirt to the first meeting).

As shown in Figure 6-1, when we see what is visible (and can thus note what is not visible),we are observing one side of two different types of situations: (1) where the visible is the effect and the invisible is the cause, and (2) where the visible is what exists and the invisible is what doesn't exist. And farther below the surface is a third type of invisibility — the unknown. In leading the change at IBM, Gerstner had to perceive all three types of invisibility.

In Chapter 1 (page 3) we described the impressions of former Toyota chairman Hiroshi Okuda of the increasing competition from the excellent Chinese workforce. In our reading of that case, perception again was required at three levels, as shown in Table 6-1.

A middle manager who took Shoji Shiba's MIT class on breakthrough in 2002 diagrammed his company's current culture as shown in Figure 6-2. We assume the middle manager depicted in the figure what was visible and relevant to him. Remembering the three levels of perception,

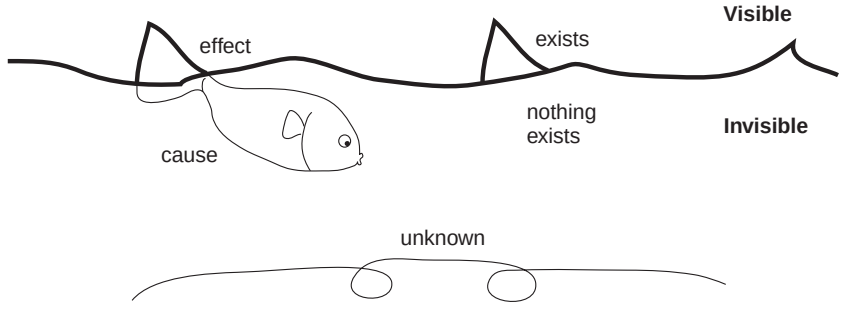


Figure 6-1. Types of visibility and invisibility.

however, we immediately ask ourselves if anything is missing from the diagram (was the manager not seeing something)? We notice that the diagram includes nothing about competitors, markets, customers, or technology — but it would be surprising if nothing in any of these areas affected the company culture. Perhaps the manager misunderstood the question. On the other hand, it is just as likely that the missing areas were invisible to the manager; perhaps he or she was focused on the accounting department or manufacturing processes. We frequently see managers who are blind to part of the overall picture. This may be all right for a middle manager, but the top manager cannot afford such blindness just because something is invisible or unknown.

Table 6-1. Three types of perception on Okuda's situation.

Visible

- 20–24 years of age
- right-handed
- eyesight better than 2.0 [20/20]
- height 155–165 cm

Invisible

- Okuda's perception about the workforce [he is thinking about the manual labor workforce]

Unknown

- the changes in the Chinese labor infrastructure

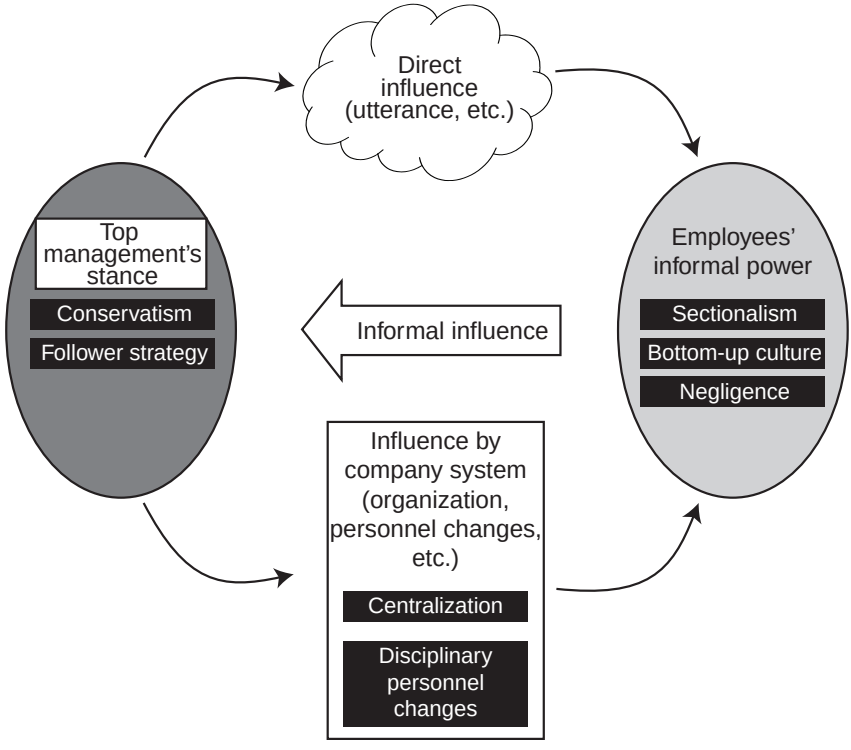


Figure 6-2. A middle manager's view of his company's culture.

The obvious question, then, is how does a leader increase his or her powers of observation?

Japanese quality professionals have developed three key guidelines for improving observations, known as the sangen principles:

1. Gen-ba: Go to the source.
2. Gen-butsu: Focus on specific objects and elements.
3. Gen-jitsu: Identify interrelationships among the objects and elements.

The sangen principles for observation are consistent with the words of Taiichi Ohno, one of the key developers of the Toyota production system: "Observe the production floor without preconceptions and with a blank

mind. Repeat 'why' five times."[2] The Toyota approach also involves looking for the true cause based on a strong belief that there is a single right answer.

If we think about the sangen principles, they also are consistent with the scientific method. Steven Spear and Kent Bowen (Spear99) define the essence of the Toyota production system as the continuous use of the scientific method throughout the organization, but especially the use of the scientific method by the people on the production floor to find opportunities for improvement, to try new ideas, and to keep successful improvements. Particularly interesting is Toyota's approach to teaching leaders. Top managers at Toyota are taught that their job is not to make improvements but to help their workers and lower-level managers learn to use — and use all the time — a scientific approach to improvement. In a later paper (Spear04), Spear lists four "lessons" for improvement:

1. There's no substitute for direct observation.
2. Proposed changes should always be structured as experiments.
3. Workers and managers should experiment as frequently as possible.
4. Managers should coach, not fix. (Spear04, pp. 78–86)

In this paper Spear describes how a high-level manager new to Toyota spent his first three or four months with the company personally observing and practicing hands-on improvement as if he were a machine operator before he ever went to the plant he was going to manage. Only by personally understanding the Toyota approach to observation and improvement would the manager be in a position to teach others; and at Toyota the senior manager's job is *not* to make improvements himself.

The three sangen principles have proved very useful. However, they were developed in the context of incremental improvement, in which their purpose was to find facts; for the purpose of breakthrough, in contrast, we need to observe in a way that will help us create new meaning.

This distinction is shown in Figure 6-3. The second column of the figure shows the limited scope of the sangen principles as applied to finding facts in the context of incremental improvement. The fact finding is "in the box," narrowly focused on the current problem. For instance, Liker describes the "Ohno Circle" where the person trying to understand or solve a problem draws a circle on the floor and stands in that circle

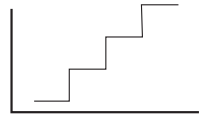
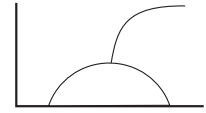
Sangen principles	Incremental improvement: Find facts	Breakthrough improbement: Create new meaning
		
1. Go to the source.	Source closed: within current business boundary	Source open: beyond current business boundary
2. Focus on specific objects and elements.	Focus on existing objects and elements	Observation spanning the visible and invisible
3. Identify interrelationships among the objects and elements.	Trying to measure existing relationships using measurable metrics	Finding the meaning behind the relationships

Figure 6-3. Sangen observation principles for incremental improvement redefined for breakthrough transformation.

for many hours observing a process and thinking about it.[3] Similarly, Stephen Spear describes the new manager learning Toyota's system by sitting and waiting until he could directly observe an infrequent failure.[4]

The third column of Figure 6-3 suggests how we can interpret the three principles more broadly for application in creating new meaning in the context of breakthrough management — for thinking "out of the box." We elaborate on the first sangen principle in the next section and on the second and third sagen principles in the following two sections.

6.2 Go to the source

For the purposes of breakthrough, you need to observe, find symbolic meaning in your observations, and perceive a new opportunity. But before you can observe, you need to go to the source. This first sangen principle is consistent with Shoji Shiba's "fishbowl principle,"[5] as shown in Figure 6-4. First you go to the source, wherever it is, and dive into

the water, using methods such as we'll describe below. Second, you swim in the relevant environment and use your powers of observation, using methods such as we'll describe in sections 6.3 and 6.4. Third, you climb out of the fishbowl and analyze what you saw, using methods such as we will describe in Chapter 7.

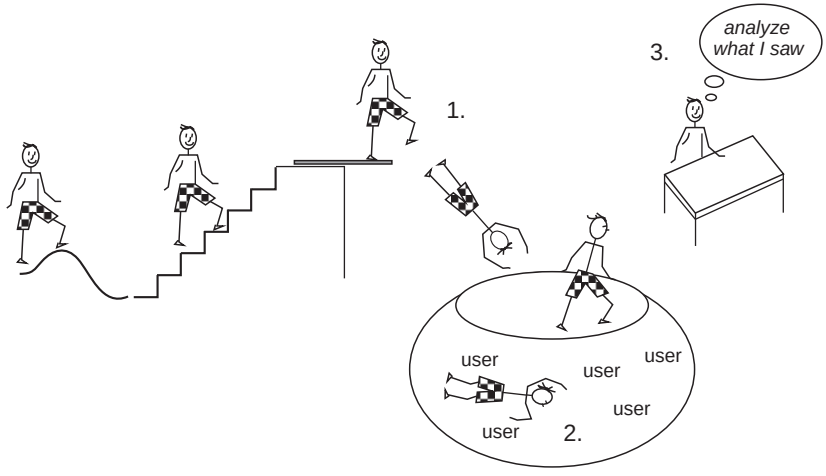


Figure 6-4. Shoji Shiba's fishbowl principle.

While observing people seeking breakthrough, we have seen many interesting examples of and ideas for going to the source; that is, for jumping in the fishbowl, wherever it is to be found.

In the Teradyne Aurora case study (Chapter 8), Teradyne CEO Alex d'Arbeloff explored broadly before making his decision — asking one of his divisions to do CMOS (a type of semiconductor technology) development and studying test systems from a vendor named ASIX.

In *The Innovator's Dilemma* (Christensen97) Clayton Christensen says that when seeking breakthrough a leader must take action before careful plans are made. In contrast, in a sustaining situation leaders plan before taking action.

A Toyota approach — *genchi genbutsu* — is described in Chapter 18 of Jeffery Liker's *The Toyota Way* (Liker04). *Genchi genbutsu* means "go [to the source] and see for yourself to thoroughly understand the situation"

so as to make correct decisions, build consensus, and achieve goals at the best speed the company can manage.

We have always been impressed by the Five Principles of Customer Visitation outlined by George Fisher, then CEO of Motorola:[6]

1. **Start with the CEO.** The customer visitation program must start with your CEO. It is an important, visible sign of respect to the customer. It is also a good signal for your employees.
2. **Don't sell.** Don't visit to sell, but to visit with and listen to the customer.
3. **Ask key questions.** What does the customer like about doing business with your company? What does the customer not like about doing business with your company?
4. **Meet the toughest customer.** Motorola had a certain demanding customer in Japan. If it could make this customer happy, it could satisfy any customer.
5. **Meet customers you want to understand.** If you want to see your product used, you need to see an end user. If you want to understand distribution channels, visit a dealer. If you want to understand the purchasing process, interview the participants in the decision to buy.

We see a parallel between these five principles and the fishbowl principle:

1. Start with the CEO — jump fearlessly into the fish bowl.
2. Don't sell — listen and collect intuitive insight.
3. Ask key questions — you need to ask the questions to get the answers.
4. Meet the toughest customer — do not be afraid to swim to the most "dangerous" part of the fishbowl.
5. Meet the customers you want to understand — go on-site; that is, go wherever there is a relevant fishbowl.

There are three important aspects of going to the source.

First, going to the source helps you learn and unlearn. You need to study intensively regarding the company or business objective, but you must not be trapped by previous experience. Using the 360-degree principle — looking at something from all perspectives — helps with learning

and unlearning.

Second, use a "stepping-stone" approach to going to the source. Avoid a rigid schedule and plan. Be flexible and follow where trial and error takes you. Keep an extra day available just in case it is useful. It's a shame to encounter an opportunity to gain important insight but to be locked into an unbreakable appointment somewhere else. You also need to work on having mental and physical stamina to keep following where trial and error leads you.

Third, seek diverse examples. You want to observe real, specific situations. The goal at this point is not conclusions based on a statistically significant number of samples. Rather, the goal is to see sufficient diversity to stimulate new insights. Abbie Griffin and John Hauser's research (Griffin91) showed that as few as 10 customer visits can cover 70 percent of the available instances if the visits are selected to include a diverse set of customers. The "three sample principle" is also a useful rule of thumb: Always get three samples (e.g., analyze three competitors); this provides important diversity without requiring a comprehensive survey.

6.3 Discovering through visual images

We turn now to our broadened version of the second sangen principle (see Figure 6-3): For fruitful discovery, make observations that span both visible and invisible elements of the situation.

As shown schematically in Figure 6-5, we start with something we want to observe — an **O**bject. Ultimately, we want to describe what

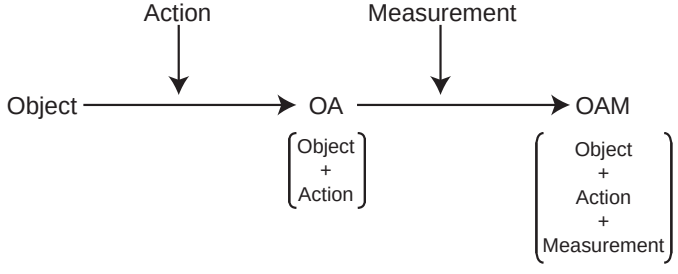


Figure 6-5. Discovery through visual images.

we have seen as if we have **M**easured it — using language data, as we'll describe in Chapter 7, to clearly portray what is happening. In between we need to take the **A**ction of observing the object — seeing it, touching it, hearing it, and so forth. In particular, we are going to focus on the visual image of the object.

In the previous two sections we talked about the importance of intuitive observation and the importance of going to the source to observe what is happening. People tend to already have a hypothesis when they begin observation and to do a sort of objective observation to test against that hypothesis. This is very natural and human: We gravitate toward a hypothesis that feels consistent with the past and present.

For the purpose of seeking future breakthrough, however, it is better to observe without a prior hypothesis and to observe using our intuitive instinct. This is a distinct skill. During a tour of a Dell plant in 2003, Shoji Shiba saw a wall chart that made the distinction explicit, as shown in Figure 6-6.

Backward focus	**Forward focus**
What's not working	What's working
Reason why we can't	Results/goal – how can we?
Problems	Solutions
Reduce errors	Increase accuracy

Figure 6-6. A wall chart at a Dell plant distinguished between backward-focused and forward-focused observation.

To observe without a prior hypothesis and using one's intuitive instinct for the purpose of seeking future breakthrough is difficult; it is more easily done when you have training in an appropriate approach. An interesting approach is VTS (Visual Thinking Strategy), which uses art to teach thinking, communication skills, and visual literacy to young people. This is a new activity in the field of museum education. We will sketch the method here, but see `www.vue.org` for a more complete description; our sketch (including some exact words) comes largely from

that source. We see VTS as also being relevant to business.

Philip Yenawine is director of education at the Museum of Modern Art (MOMA) in New York City. Abigail Housen is a developmental psychologist. In 1988 Yenawine and Housen began working together to investigate the effectiveness of MOMA's education programs for students and for teachers. They found the programs assumed greater capability than participants typically had. They found that both students and teachers had relatively little skill in looking at art and thus gave naive interpretations of what they saw. Thus, MOMA undertook to revamp its education program — and the result was the Visual Thinking Strategy. With the tools of VTS at their disposal, teachers with relatively little experience in viewing art were able to facilitate significant growth in their students' ability to view art.

Teachers using VTS ask open-ended questions beginning with:

- What's going on in this picture?
- What do you see that makes you say that?
- What else can you find?

The teachers paraphrase and reinforce what the students say, encourage differing observations and interpretations, and encourage students to build on one another's ideas. Through such observation and discussion, students become more sophisticated in seeing the complexity and subtlety of artwork.

The components of the method are shown in more detail in Figure 6-7.[7]

The VTS organization sells training materials, including pictures such as that shown in Figure 6-8. A complete K–5 curriculum was published in the fall of 2000, and the program is being diffused to other U.S. museums, such as the Museum of Fine Arts in Boston.

Here are two examples of possible answers to the first two questions with regard to the photo shown in Figure 6-8:

Example 1. *What's going on in this picture?* The father is depressed because he has lost his farm. *What do you see that makes you say that?* He is a farmer because he looks like he is in farm clothes and he is sitting in front of a building made with barnlike wood. You can tell from the expression on his face that he is depressed. The

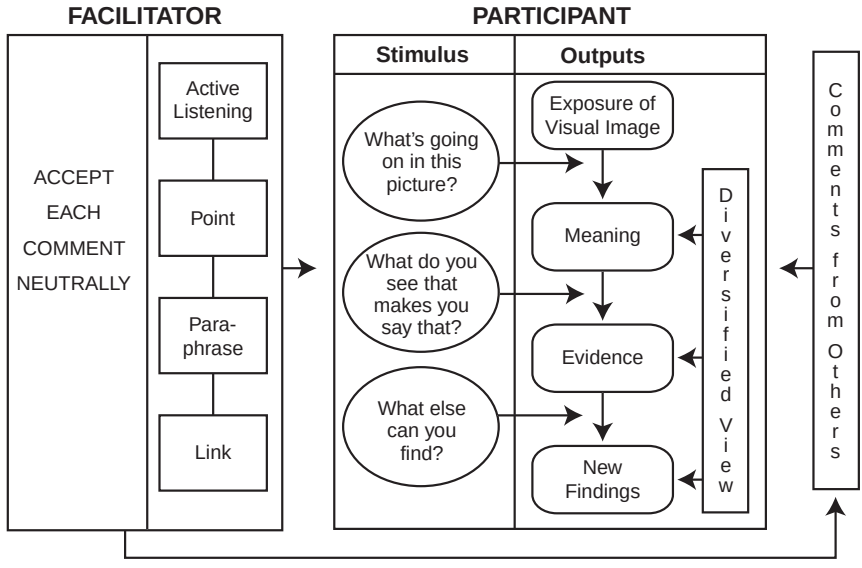


Figure 6-7. The structure of the Visual Thinking Strategy.

poor condition of his clothes shows that he is financially strapped. It stands to reason that he has lost something important, such as his farm. Another indication that he is depressed is the expression on the older girl's face; also, the younger girl is trying to comfort him and seeks comfort herself.

Example 2. *What's going on in this picture?* The man has lost his wife. *What do you see that makes you say that?* There is no wife and mother in the picture, and the man looks distressed. Also, the daughter's expression indicates concern: "What will we do now?" And the little boy is seeking comfort from his father.

Notice that different people may see different stories in the same picture. They may even differ on the specific details upon which they base their conclusions, such as the question of whether the smaller child with short hair is a girl or a boy. Having heard one another's stories, participants will be better prepared to answer the third question and, perhaps, to find an entirely new viewpoint.

Figure 6-8. Photo of man and children. (Source: Untitled photograph by Doris Ullman of Cheevers Meadows and his daughters, Cleveland, GA, c. 1933, University of Oregon Library, Special Collections & Architecture & Allied Arts Library Visual Resources Collection.)

Now look at the Rembrandt painting in Figure 6-9 and ask yourself the three questions. What different answers to the three questions can you come up with?

Figure 6-9. Rembrandt's *De Staalmeesters*, 1622. (Rijksmuseum, Amsterdam.)

Here are some example answers that come to mind for us:

Example 1. *What's going on in this picture?* It is some sort of ecclesiastical court, and the judges are listening to evidence in a case. *What do you see that makes you say that?* It is common for judges to wear similar clothes — a sort of uniform. These guys look like they are listening to someone else talking, or perhaps the third man from the left is asking a question of someone making a presentation to the court. Also, the book is on a piece of furniture that might be a church pulpit or alter, and the pulpit or alter covering is of rich texture like tapestry material you might find in a church court.

Example 2. *What's going on in this picture?* It is a group of businessmen. *What do you see that makes you say that?* They are all wearing the style of the day (the way navy blue pin-striped suits and white shirts

might be worn in a particular company today). The book they are looking at looks like a business ledger from the era of the painting. The second man from the left is leaning toward the third man from the left as if the second man is advising the third man about something. They look wealthy, as successful business men might look.

Example 3. *What's going on in this picture?* The men are listening to someone and asking him questions. They are probably businessmen. *What do you see that makes you say that?* They all seem more or less focused on one person out in front of them. The third man from the left may be asking questions. The second man from the left may be whispering the next question to be asked. The book is big, like a business ledger a few hundred years ago. The men look wealthy and Dutch, which suggests participants in a successful business. Also, the artist bothered to paint them, so probably they could afford to pay him. Also, if they were having their picture painted, they wanted to put forward at least an appearance of success, and the cloth on the table top looks very luxurious.

Now to the third question, *What else can you find?* Participants might get to the deduction that perhaps the business is making cloth like the fabric under the book, and the name of the painting suggests this is true: *De Staalmeesters* translates as *The Masters of the Cloth Drapers Guild*.

The question "What else can you find?" is in some ways the most important question of the three, because it can lead to new points of view — to what might be called a discovery cycle, as we'll discuss shortly.

If we reflect on the VTS method, we see that fundamental to the method is the fact that there is no single, correct, objective meaning of what is observed. Different people find different and diverse meanings from their observations, and this is a potential source of creativity and innovation.[8] Such diversity is particularly useful if it is embedded in an individual or group process of observation and reflection, such as is shown in Figure 6-10. Alternating observation (shown along the lower line in the figure) and reflection (shown along the upper line) is a form of the scientific method (alternation between observation of empirical results and refinement of a theory). Individual and group skill in alternating observa-

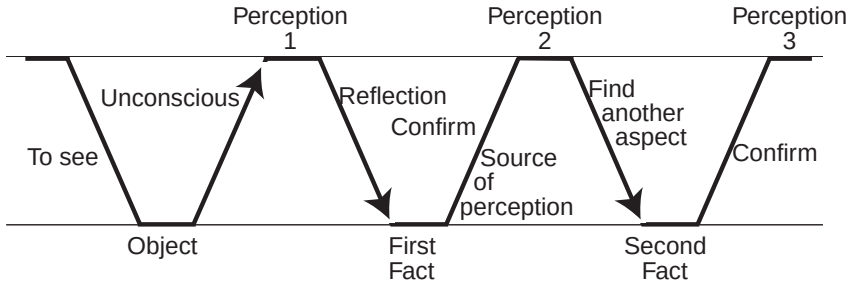


Figure 6-10. Scientific approach to observation.

tion and reflection leads to better answers. Unfortunately, a nonscientific approach (no alternation between observation and reflection, as shown in Figure 6-11) is more common.

Image → Perception → Conclusion

Figure 6-11. Nonscientific approach to observation.

We can reillustrate Figure 6-10 as what we will call the cycle of discovery (see Figure 6-12). We see a symbolic image. We perceive an initial meaning (i.e., answer the question, "What is going on in this picture?"). We consider what evidence supports our initial meaning (i.e., answer the question, "What do you see that makes you say that?"). Thus, we develop

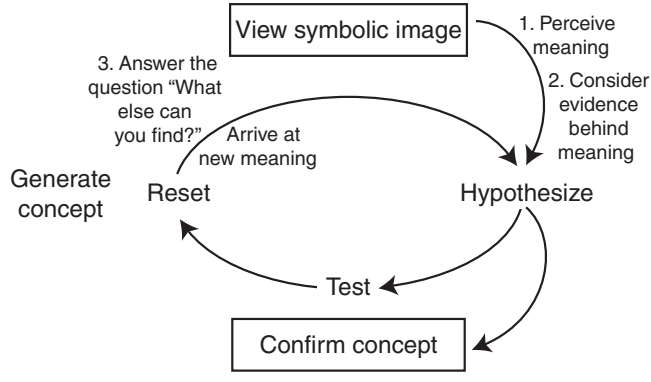


Figure 6-12. The cycle of discovery.

a hypothesis which we mentally test; we then reset our viewpoint as appropriate (i.e., answer the question, "What else can you find?"). After several cycles, hopefully we will have generated a productive concept and confirmed it.

6.4 Digging beneath the surface of an image

The Visual Thinking Strategy uses the general questions noted on page 141 to help people think deeply about an image. However, it would be useful to have a more systematic way to dig deeply into visual images — in the words of our third expanded sangen principle (Figure 6-3), to seek the *meaning* behind the relationships among things. Looking from different points-of-view can help. We suggest five possible points of view (POV) approaches: (1) observe the periphery, (2) discern what is missing, (3) look for shadows, (4) look for symbols, and (5) make comparisons.

POV 1: Observe the periphery

Information may be found when we focus on the periphery or edges of a situation.

For instance, when we first look at Figure 6-13, we see two prosperously dressed men with a number of valuable and sophisticated items on the shelves between them. Looking at the bottom middle of the periphery of the painting, however, the elongated item there must have some special meaning that needs to be better understood. Also, you may be able to see at the top left of the painting, between the edge and the curtain, something white and much taller than it is wide; this also calls for additional investigation.[9] Interestingly, our case studies of FAVI and SOL in Chapter 3 focused on another kind of periphery — the periphery of the evolution of business practice in Europe. SOL is in Finland at the edge of Europe; FAVI is located away from the center of France.

When we look at a factory, typically we focus on the production line. However, insights also may be found in places at the periphery of the production line. For example:

- the workers' toilets and storage areas

Figure 6-13. Hans Holbein the Younger's *The Ambassadors*, 1533. (The National Gallary, London.)

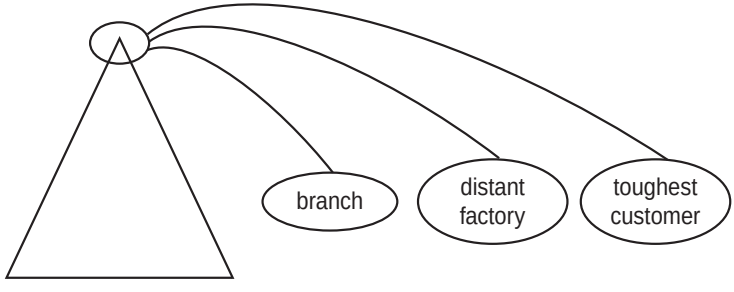


Figure 6-14. A CEO's psychological periphery.

- the parking lots
- the back rooms of the cafeteria
- the trash and waste bins and dumpsters
- the employee meeting room on the shop floor (the place where they sit during breaks)

Solectron considers itself to be a company that practices the 5Ss (see note 6 on page 254 for a description of the 5Ss). Visiting a Solectron factory in 1993, Shoji Shiba was reassured that the company took the 5Ss seriously when he saw that a conference room peripheral to the production line was also in good 5S order. On the other hand, while visiting a high-tech Taiwan company that apparently had a good production process in 2002, Shoji Shiba was not reassured to see random placement of cabinets in a corridor, crooked and disorderly placement of notices on a bulletin board, and scratches on the wall of the toilet area. Six months later the company underwent a major restructuring. During a 2003 visit to TVS Motors in India, Shoji Shiba was reassured to see that in the toilet stalls, personal cleaning aids were precisely placed on marks indicating correction locations, just as if these cleaning aids were tools carefully sited on the production floor.

In addition to considering the physical periphery, it often pays to consider the psychological periphery. From the point of view of the CEO at the top of the corporate headquarters hierarchy (Figure 6-14), the branch office, offshore factory, and toughest customer are at the periphery of what the CEO can easily see.

Andrew Grove, then CEO of Intel, often noted that the CEO's position possesses great administrative power but is lacking in information power. The information power is often at the periphery — at places such as those shown in Figure 6-14. As Grove said, "Water does not go to high positions; the guy at the top is always the last to know." Thus, a leader in a high position must work hard to see what is happening at the periphery of his or her daily world. One approach is to regularly visit the periphery; that is, to bring it virtually to your center of things. A famous U.S. Army General once said that the reason he left headquarters behind the lines and went to the front where the bullets were flying was because it was the only way he could find out what was going on at the front.

POV 2: Discern what is missing

A step beyond viewing the periphery of a situation is "looking at" what is not there — what is missing from the picture. For example, some interpretations of the Figure 6-8 photo were based on the absence of a wife and mother from the photo. In a business example, Louis Gerstner saw what was missing on the day of his first visit with the IBM management team. As quoted earlier, *"There was not a single indication in the artwork or other display that this was a computer company. There was no computer in the CEO's office."*

Here are two more simple examples of the significance of what is missing. In the first instance, Shoji Shiba was staying in a hotel in Japan, and there was a breakfast notice in the room showing a Japanese-style menu and a Western-style menu. Both menus had details of the elements of each meal and price including service and tax. But the start time for breakfast was missing. To Shoji Shiba this indicated something important about the hotel's view of the customer: that the hotel was going by its own (perhaps unconscious) view of what customers wanted rather than actually learning from customers what they wanted. There also was no English translation of the Japanese-style menu while there was an English translation of the Western-style menu. The hotel's assumption on this latter point was quite clear: Japanese people may want Western-style breakfasts, but westerners do not want Japanese-style breakfasts (which is certainly not true for all Western visitors to Japan).

In the second instance, Shoji Shiba was teaching at a business school and asked his students to create models of the problems on which they were currently working. One student's diagram (see Figure 6-2) focused only on internal issues of the current organization, such as top management's conservative "follower" strategy, employees' views of sectionalism, a bottom-up culture, and so on. But there is no indication of problems related to customers, technologies, suppliers, or competitors — nothing related to the outside world. The student had apparently only thought about what went on inside of the organization.

Sometimes an observer can discern what is missing by mentally summarizing what is there. For instance, a product planning meeting may include company insiders from the marketing, development, manufac-

turing, and accounting departments. From the absence of anyone from the sales department (not to mention an actual customer), we might wonder if the customer point of view is being adequately considered. Observing an all-male meeting may prompt the thought, "Women are missing." A very calm and orderly meeting may indicate that things are under control, or it may indicate that a sense of urgency is missing.

That something is missing from a picture may mean that something is coming. If that is the case, using all our senses may help us discern what is coming (a typical movie technique is to allow viewers to hear a train whistle before they see the locomotive on the screen). That something is missing also may mean that something was present but is no longer. In this case there may be residual indications of what was there, like unpolished spots on a tile floor indicating that something has been moved away since the last time the floor was waxed. Of course, what is missing may not be coming and may never have been there. In such a case, discerning what is missing may require other techniques, such as comparison. In other cases there may be no evidence, and it may take a jump in insight to discern what is missing.

In some ways the opposite of "What is missing in this picture?" is "What is out of place?." For instance, suppose a CEO is attending a meeting involving the people from all of the functional departments that have day-to-day contact with a particular customer. The CEO is perhaps out of place in this meeting: He does not have day-to-day contact with the customer, and he is several steps above everyone else in the company hierarchy. The CEO's participation may mean that the CEO is being a symbolic role model (as suggested in the SOL case in Chapter 3) or at least is trying to make sure this customer gets the attention it deserves. It may also mean the CEO is trying to enforce some perhaps unfounded preconceptions about what should be done for the customer. In either case, there could be useful information in seeing what is out of place.

POV 3: Look for shadows

The shadows cast by what is going on may provide insight that we cannot glean by looking directly at the situation.

Professor Noriaki Kano, the keynote speaker at a Quality Control Circle meeting in Ibaraki, Japan, in October 1999, talked about shadows. He started by noting that a person's mental barriers often prevent the person from seeing visible shadows. He used a case study from Konica to illustrate his point.

In 1965 Konica was the first company to offer 35mm single-lens-reflex autoexposure cameras. In 1977 Konica led the way again; this time it was first to offer a 35mm compact autofocus camera. Professor Kano explained how this came about.

Previously, Konica had done a lot of traditional market research on the detailed functioning of a camera, but it had not asked as basic a question as "Why do young people buy a camera?" As a result of asking this question, Konica got back a very basic answer: "Customers buy a camera to take photos!" In other words, customers want to have a photo that shows what they saw in person. This led Konica to consider how it could help customers take photos that clearly showed what they had seen in real life. But how was Konica to get information to help it decide what to develop to help customers take better photos? It was not practical to have company representatives actually watch a large number of amateur photographers take photos. However, the amateur photographers cast a "shadow" — in the form of the rolls of film they sent to the Konica lab for processing. Thus, Konica derived data from the shadow that was the laboratory. The two most important frequent problems with photographs were (1) poor exposure, and (2) poor focus. The expert photographer with a manual camera knew how to use a light meter and had lots of experience adjusting the focus and f-stops to get the image in focus. Amateurs did not have the equipment and experience to do these things with manual cameras, as the data from the photo lab showed Konica. Thus, Konica focused its development efforts on creating autoexposure and autofocus cameras.

Looking at shadows is an example of the kind of data collection described in E. J. Webb and his colleagues' stimulating and clever book *Unobtrusive Measures* (Webb66). Webb and his coauthors encourage clever thinking to come up with innovative indirect methods of amassing data. Here are five types of such unobtrusive measures from the Webb book (with

the exception of the Chicago museum example, however, the detailed examples are not from the book):

Physical erosion and residue traces. A museum in Chicago gauged its popularity by looking at the erosion of its tile floors.

Public business information. Public information may include formal company publications such as annual reports and financial reports filed with government agencies (such as the Securities Exchange Commission in the United States). It may also include coverage of a company in the business press (analyst assessments) or in newspapers (reports on Congressional hearings).

Internal logs. Companies typically keep month-to-month records of sales that have an obvious relationship to what the company is trying to do. In the case of Konica, the company kept records of the appearance of the photos its photo lab processed.

Observation of behavior. We read about Louis Gerstner's paying attention to behavior in his first days at IBM; he noticed that the IBM people copied the color of shirt he wore (see Section 6.1), and he noted the conventional use of *presentations* of "foils" rather than real discussion (see p. 93). Jewelry shop clerks in Hong Kong are said to watch the eyes of customers to whom they are trying to sell something — purportedly the pupil of the eye expands if a customer likes a jewel. A storyteller telling a scary story to children can tell if he or she is succeeding by how the children huddle together.

Automatically recorded data. Automatically recorded data is increasingly available. Video cameras are becoming ubiquitous. Websites routinely record where people link to while they surf the web. Credit card purchases are recorded and analyzed. Store customers are encouraged to swipe store cards that give them small discounts and that allow the store to attribute the customer's purchases to the ID number on the customer's card.

Obviously there are some ethical issues with such unobtrusive collection of data, and business people must be appropriately ethical. Our

point here is to encourage (as Webb and his coauthors do) thinking about clever indirect (but ethical) ways to collect data.

We conclude this subsection as Webb and his co-authors concluded their book, with the epitaph from the grave of Cardinal John Henry Newman (1801–1890):

From symbols and shadows to truth

POV 4: Look for symbols

We can gain insight by looking for, identifying, and studying symbols that exist in a situation.

As is our wont, we first give an example from the world of art. Great painters typically show symbols in their masterpieces. Look for instance, at the painting by Velázquez shown in Figure 6-15. Nicknamed "The Lances," the painting depicts the defenders of the Netherlands city of Breda surrendering to the Spanish force that had besieged them for many months. Symbols abound. Two are immediately apparent.

- The delegation from the captured city is shown in the painting in an equal spatial position with the victorious Spanish attackers, and the Spanish leader is accepting the key to the city (itself a symbol) with a gracious gesture (perhaps according to some protocol of the time). Velázquez appears to be showing that the victors allowed the people of Breda to keep their dignity.
- The besieging Spaniards have many lances arrayed in highly erect positions, while defeated defenders have merely a scattering of weapons. Thus, it remains clear which side actually is in the superior position.

Turning now to a business example, Shoji Shiba visited a factory of Sundaram Brake Linings Ltd. (SBL) in India. The airport was far from the factory, and the trip from the airport was across a hot, dry, red rock countryside. Yet the factory grounds themselves looked like paradise, as shown in the left photo in Figure 6-16 (the same area 18 years earlier is shown in the right photo). The oasis of trees is partly a symbol of SBL's "commitment to be a socially responsible corporate citizen through the use of safe raw materials and environmental friendly practices."[10]

Figure 6-15. Diego Velázquez's *The Surrender of Breda,* 1625. (Museo del Prado, Madrid.)

More specifically, the trees of SBL are a symbol of the management style of the owner and CEO, Mr. K. Mahesh. The trees are planted one by one over time. Such consistency is indicative of the basics of TQM, which is practiced at SBL. The trees also symbolize the company's investment in equipment and plant(s).

Another aspect of Mahesh's philosophy is that there should be union and harmony between the product and the work life of employees. As an extension of the interaction between product and work life, the company helps the community — with water, the school, the temple, and other social needs.

Shoji Shiba routinely asks himself, "What is the symbol of this factory or company, or of this person?" Some years ago he visited Sun Microsys-

Figure 6-16. Trees at SBL in 2006 (left); the same site 18 years earlier (right).

tems, and a person was already waiting for him at the front door when he arrived. When they got to the meeting room, the people participating in the meeting were all already there, on time for the meeting. From such punctual behavior, Shoji Shiba drew the conclusion that *time matters* at Sun Microsystems. Later, he saw the following list of Sun Microsystems values:

- time matters
- customer choice
- courage
- individuality and teamwork
- stakeholder trust

He also heard that everyone at Sun writes software 100 percent in pure Java, demonstrating Sun's core value of Java as a business strategy.

In contrast, Shoji Shiba visited one large high-tech company in Taiwan to give a half-hour presentation to its managers. The presentation started on time, but even after 30 minutes people were still drifting into the room; from this he drew the obvious conclusion.

Another example of symbolic behavior Shoji Shiba remembers was a 1993 visit to Ko Nishimura, then CEO of Solectron. As Nishimura

and Shiba toured the factory, Nishimura asked questions of Shiba and took notes from Shiba the whole time. When their meeting was over, Nishimura stood outside watching until Shiba's car was out of sight, indicating respect for visitors such as customers.

In one more example, Shoji Shiba recalls an instance when a group from a certain company visited MIT's Leaders for Manufacturing program (LFM) to tell the then current LFM students about the company. The visiting group included three previous graduates of the LFM program and another person from the company. Among other things, they touted the importance of diversity in their firm's products and markets. Yet the four visitors were all dressed in dark blue jackets and wore white shirts and dark red ties — perhaps unconscious symbolic behavior that was inconsistent with their claims for diversity.

Sometimes what you already know will get in the way of your seeing or understanding symbols. Conversely, sometimes you will not know enough to see or understand symbols.

Thus, sometimes you may need to do some unlearning, forgetting what you already know. On the subject of unlearning, Nobel Prize winner Leo Esaki (who won the prize for his work with transistor tunnel effects) offered five rules that may "help you win the Nobel Prize" (see Table 8-5 on p. 208).

On the other hand, basic information (learning) can help you develop your ability to understand symbols. See, for example, Figure 6-17. Today, most of us probably look at these paintings and merely see beautiful impressionist images of what Paris looked like in the last quarter of the nineteenth century. However, if we read about the era in which these works were painted, we will see that they are filled with symbols and symbolic of their time. Notice the numerous instance of smoke, steam, iron, trains, and railways in these paintings. Edouard Manet said of his painting *The Railway* (upper left the figure):

> [Y]ou ask me, where the devil can the railway be in the painting, "The Railway." Where is it? By Jove! there, in this smoke which leaves its modern gray trail on the canvas. It's true, the locomotive is missing and one does not see the train. The smoke is enough for me, because it denotes the fire, which is like the soul of the engine. And

Upper left: Edouard Manet, *The Railway*, 1872–1883. (National Gallery of Art, Washington, D.C.)

Upper right: Claude Monet, *Gare Saint-Lazare, Arrival of a Train*, 1877. (Fogg Art Museum, Harvard University Art Museums, Cambridge, Mass.)

Lower right: Gustave Caillebotte, *On the Pont de l'Europe*, c. 1876–1880. (Kimbell Art Museum, Fort Worth, Texas.)

Figure 6-17. Paintings by Manet, Monet, and Caillebotte.

> the engine, as you who are listening know well, is the intelligence, the glory, and the fortune of our century. For future generations, our nineteenth century will be a locomotive, just as papal Rome is a tiara, as Venice is a gondola . . . and as our French Middle Ages is the armor of a baron.[11]

In Manet's *The Railway* we also see that the mature woman is sitting with her back to the steam and the iron fence while the young woman is facing them, perhaps fascinated by the changes that are in store for her over her lifetime.

In the three paintings in Figure 6-17, Manet, Monet, and Caillebotte painted scenes emphasizing the symbols of modernity (e.g., iron, steam) in that era. More generally, and not just in these images of modernity, their paintings showed a break with the highly regulated and staid prior French tradition of the time. These painters went outside with their newly available tubes of oil paint and interpreted and painted the real world they saw.

POV 5: Make comparisons

Once you have (1) observed the periphery, (2) discerned what is missing (and what is out of place), (3) looked for shadows, and (4) looked for symbols, it is time to (5) make comparisons.

Look at the pair of photos in Figure 6-16. We have already discussed the symbolism of the trees in the left photo. Looking at the right photo at the same time makes it clear that the trees are part of an intentional strategy.

Thinking briefly about another company and CEO, Wal-Mart founder Sam Walton, we recall Walton's statement that his key strength was observation of other companies. We take this to mean that Walton drew comparisons between other companies and his own. Wal-Mart's information systems also purportedly permit immediate comparisons of activity in Wal-Mart's own stores to help managers detect what is selling and what is not.

Now consider the pair of paintings in Figure 6-18. We will compare them in parallel with observing from the other points of view.

Figure 6-18. Two paintings by Auguste Renior. (Both at the Musée d'Orsay, Paris.)

In the center of each painting is a dancing couple. At the periphery of the left painting we see an inside wall and, thus, an inside plant and tree arrangement. At the periphery of the right painting we see a hat (which must be his hat) on the floor, trees beyond a railing, a common wooden chair, and a table with a rumpled, coarse-weave tablecloth. In terms of shadows (or light more generally), in the left painting we perhaps can see the reflection of the wall pillar on what must thus be a highly polished floor; otherwise the room is uniformly lighted. In the right painting we see light cast over her face and at his foot as if from a single overhead bulb. In that painting we also see symbols of someone trying to dress up: a fancy but not stylish hat, the affectation of a Chinese fan, and rather heavy-looking gloves. The couple in the left painting looks quite natural in their formal wear, as if they wear it often. The woman in the right painting is also quite sturdy while the woman in the left painting seems more slight.

Taking all these comparisons together, it seems relatively clear that we have a more refined city couple in the left painting and a less formal country couple in the right painting; and this matches Renoir's names for the paintings, *Dance in the City* and *Dance in the Country*. The city dance appears to be in a formal ballroom, while the country dance is perhaps in an outdoor café. If we think about what is missing in one or the other paintings while comparing them, it seems that there is less passion in the case of the city couple than in the case of the country couple. We might speculate that for the city couple such dancing is quite routine, so they are quite bláse about what they are doing, while the country couple seldom has an opportunity to dress up and dance and they are feeling quite romantic about it. We also see a bottle of wine and coffee cup in the country image and signs of drinks are missing from the city image; perhaps the country dance is in the context of the party following a wedding.

Of course, in real life, we now would need to investigate the actual situation more closely to try to confirm our hypotheses.

Figure 6-19 sketches how we pulled together use of the five points of view described in this subsection in our observations of the *Dance in the City* and *Dance in the Country* paintings. Let's apply this sequence to a business situation.

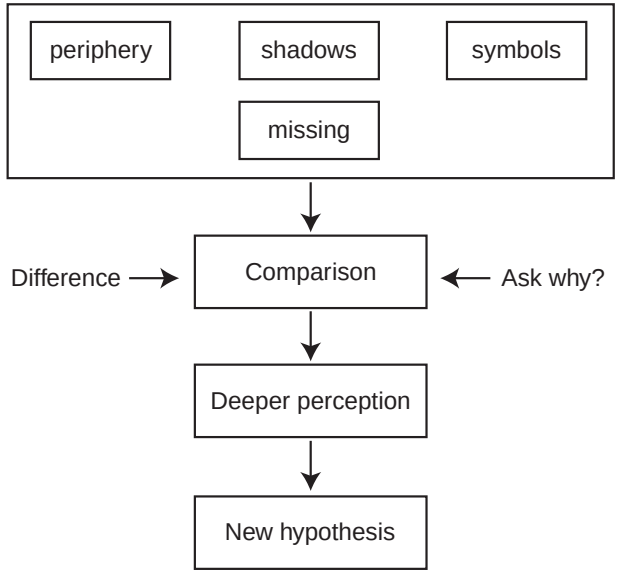


Figure 6-19. Seeking meaning from a visual image.

Dale Farm Ltd. is the largest dairy business in Northern Ireland and sells products in every dairy category under the leading brand names of Dale Farm, Dromona, and Spelga. Together, Dale Farm's 5 manufacturing locations in Ireland can process in excess of 500 million liters of milk each year; the company's continued investment in people and technology ensure "world-class performance and product excellence."[12] The Dale Farm group currently employs approximately 1,000 people. It has 14 main distribution depots and more than 250 franchised milkmen in the province.

Shoji Shiba visited the Dale Farm Technical Center in Pennybridge, Ballymena, in November 2004 and met the new CEO, David Dobbin, who was intent on changing the business. In Figure 6-20 we see at left, a page of Dale Farm's 2002–2003 annual report of the United Dairy Farmers (which owns Dale Farm) — at right is a page from the 2003–2004 annual report. Let's look at what we can see in the two halves of this figure from the points of view listed in Figure 6-19.

Left image: We see two bottles of some sort of drink, but it is not obvious to a person not already familiar with it what sort of drink it

Figure 6-20. Dale Farm promotional images. Left: Image from 2002–2003 report. Right: Image from 2003–2004 report.

is or even what its exact name is — Intune or Cintune? We also see a tub of butter. Looking at the periphery, we see the phrase "Probiotic Health Drink" on the bottom of the front bottle. We also see the Dale Farm logo at the periphery of the whole image and at peripheries of the bottle and butter-tub labels; from this we might guess that the company is focusing more on the branding of its product groups (e.g., Intune and Dromona) than on the branding of the whole company. Also, at the bottom of the butter-tub label we see the slogan "Natural Butter that's easy to spread." The term "natural" may be intended to suggest the butter is healthy, and "easy to spread" refers to product quality. In terms of shadows, we appear to see some reflections in the bottles and some vague image across the back of the figure; the quality of the image makes it hard to learn much from this. The symbol of the sun is on the bottles, and the LA-5 symbol at the bottom of the front bottle perhaps means something

obvious to the company's customers in Northern Ireland. Missing is any clear, specific statement of what the company is trying to get across with this image. This could mean that the company is trying to be subtle, or it could mean that the company is not clear on its mission.

Right image: We see four photos of active people. Missing are any overt product images or names; we see only the spontaneous looking eating and drinking of what may be company products. Again, the Dale Farm logo is at the periphery, and the hint at what the company is trying to get across is also at the periphery: " . . . a taste for life." The people in the photos are of all ages and are obviously symbols of healthy living. We don't see any significance in the shadows of this image.

Comparison: When we compare the two presentations, it seems clear that in 2002–2003 the company was primarily promoting its products with a few hints (the words "pure" and "natural," the emblem of the sun, and the term "Probiotic Health Drink") of how the products relate to healthy living. It also seems clear that in 2003–2004, Dale Farm was primarily promoting healthy living and conveying only a few hints that people should consume the company's products in order to live well. Thus, we see a transition from product focus to healthy-living focus. Seeing the lack of specificity about what is being stated in both images, we conclude that this is the aesthetic of the company or of its advertising agency and not an indication of company confusion. The double meaning of "a taste for living" in the 2003–2004 image is particularly subtle.

From our comparison we can see the new CEO's image of how he was changing the company: from a company selling products to a company selling healthy lives for its customers.[13]

We finish this subsection with one more comparison. Figure 6-21 shows the core values of Intel and General Motors as presented to students in MIT's Leaders for Manufacturing program by representatives of the companies. Both Intel and GM are major American companies, but their core values are quite different. What hypotheses come to mind

Intel	General Motors
Customer orientation	Customer enthusiasm
Results orientation	Integrity
Risk taking	Teamwork
Great place to work	Innovation
Quality	Continuous improvement
Discipline	

Figure 6-21. Core values of Intel and General Motors as presented to LFM students at MIT.

about the cultures of these companies as you compare the two sets of core values?

When we generate hypotheses, no suggestion is necessarily right or wrong; the question is, Which is more plausible? The ability to see more possible hypotheses is valuable. Two possible hypotheses come quickly to mind for us:

Hypothesis 1: The companies' cultures are driven by the history of their business. GM has been in business throughout much of the era of the automobile — approximately a century. Intel has been in business throughout the era of the integrated circuit — about 35 years.

Hypothesis 2: The companies' cultures are related to the "clock speeds" (see Chapter 2, p. 34) of their respective industries.

In speaking of Intel, Andrew Grove, then CEO of the company, presented three important questions that are forms of comparison:[14]

- Is your key competitor about to change? When there is a shift in the rankings of your competitors, something significant is going on.
- Is your key complementor about to change? Complementors are the businesses or institutions that have common interests with your

company, such as customers or suppliers. If the complementor that mattered most to you in the past seems less important today, something significant is going on.

- Do people around you seem to be "losing it"? If some people "don't seem to get it," or if you yourself are often inclined to shake your head in confusion, something significant is going on.

While we gave Grove's three questions as examples of comparison as a way to perceive change through image data, the questions also apply more broadly. They point us back to the conditions that require us to seek breakthough — such as when there are indications of a 10× change in our markets, technology, or societal context. In Chapter 7 we describe a process for discovering a potential new direction through analysis of language data.

Chapter 7

Creating Future Concepts through Language Data

In Chapter 6 we discussed how we can more effectively acquire useful information about a change through intuitive observation. For example, we described how we can see what is invisible and unknown by viewing what *is* visible. In this chapter we'll introduce the Five-Step Discovery Process which begins with intuitive perception of a change and moves from there. First, however, we'll consider discovery as a problem-solving process and we'll look at the respective roles of image data and language data.

7.1 Discovery as a problem-solving process

Discovering a possible opportunity and conceptualizing how to exploit it is a problem to be solved. Typically, people approach any sort of problem solving in one of two ways: scientifically or nonscientifically. Unfortunately, a nonscientific approach is often used.

There are two typical nonscientific patterns of problem solving, as diagrammed in Figure 7-1.

1. Sometimes the supposed problem solving all happens at the level of thought (top line of figure). A problem is sensed (a in the figure), there are opinions and arguments about what to do (b), a solution to the problem is declared by someone in a position of authority (c), and appropriate action is assumed (d). Notice again that here we are analyzing the situation only at the level of thought or theory (top line of the figure). Sometimes an action plan is actually created

and carried out, and people then discover whether the problem has been solved or not. Oftentimes, however, little is actually done to change the current (problem) situation, and the problem is ignored until it next rears its ugly head; this scenario is all too common.

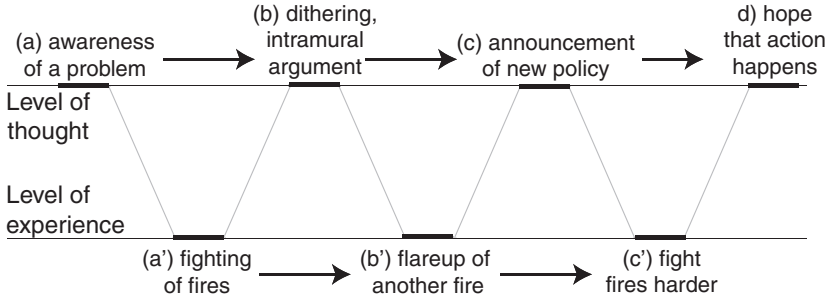


Figure 7-1. Two nonscientific approaches to problem solving.

2. Sometimes the supposed problem solving all happens at the level of experience and action (bottom line of Figure 7-1). Problems are fought as they come up (a′), a new problem comes up (b′), the new problem is added to the list of problems being fought (c′), and so on.

The first nonscientific approach — all at the thought level — has the problem that speculation, opinion, and even analysis about the problem are never tested empirically. The supposed problem is not confirmed empirically, the supposed solution is not confirmed empirically, and the actual fix is not confirmed empirically. We have all seen such "problem solving." The second nonscientific approach — all action — has the problem that when people work entirely in a firefighting mode (i.e., only at the empirical level), the specific problems are not abstracted to see if they are symptomatic of more general problems that need to be solved; additionally, often no attempt is even made to prevent the just-solved problem from happening again. Neither nonscientific approach puts any effort into getting better, much less into getting better at getting better.

Scientific problem solving, on the other hand, involves alternating between the level of thought and the level of experience, as in Figure 7-2:

theories are tested empirically, empirical observations are studied to see if a theoretical model can be created that explains the observations and, thus, can be used to make more changes that have greater impact.

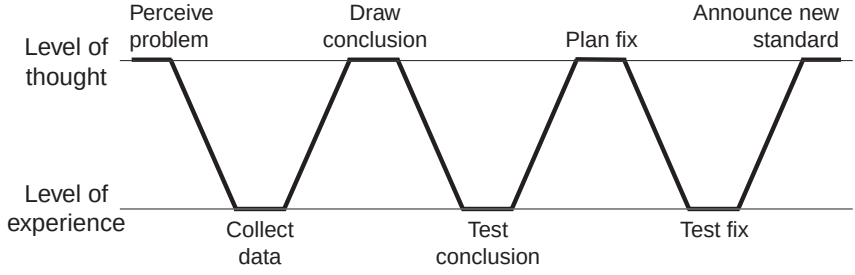


Figure 7-2. The scientific approach to problem solving. Alternating between thought and experience.

Such alternation between the level of thought and the level of experience is implicit in the Five-Step Discovery Process we show in Figure 7-3.

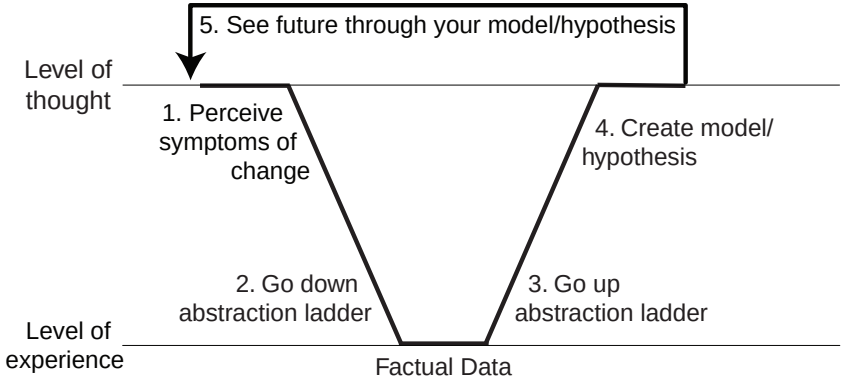


Figure 7-3. The Five-Step Discovery Process.

7.2 Image data versus language data

In the Five-Step Discovery Process, we see the use of two types of data: As shown in Figure 7-4, image data at the level of thought (near step 1 in

the figure), and language data at the level of experience (between steps 2 and 3 in the figure).

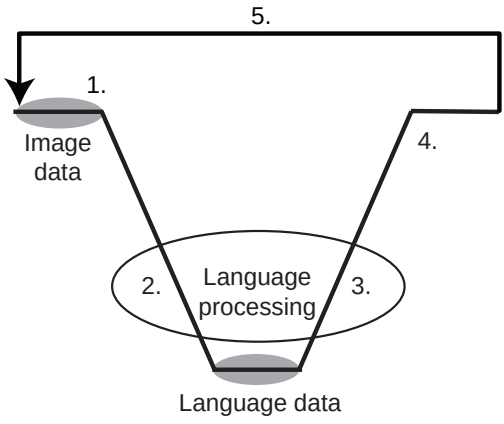


Figure 7-4. Image data and language data in the Five-Step Discovery Process.

From image data we can sense the essence of a situation. For instance, in the Teradyne Aurora case study (Chapter 8), from looking at the Windows NT catalog Alex d'Arbeloff got the sense that CMOS was cheaper than the technology Teradyne had been using, and that perception led ultimately to his initiation of the Aurora venture. Image data is used also to deliver essential messages: In Chapter 2 FAVI's tree and SOL City were examples of this function.

Russell Ackoff talks of type 1 system properties and type 2 (or "emergent") system properties (Ackoff81). We can measure a type 1 system properties by measuring the system's component parts; for instance, the sum of the weights of the parts of an automobile is the total weight of the automobile. Type 2, or emergent, system properties cannot be measured directly but are seen only in the *interaction* of the parts. For instance, we cannot assess an automobile's ability to accelerate by measuring any of the individual components of the automobile — the ability to accelerate comes from the interaction of all of the automobile's parts. Image data are something like emergent properties: They are not seen in individual facts but emerge in the overall image.

It takes practice and skill to interpret image data (to move from an

intuitive image of the essence of an issue to logic upon which we can act), and we described methods of processing image data in the previous chapter. The rest of this chapter is devoted to methods for dealing with language data, and we will assume the initial image (sense) of the situation is already available.

7.3 Language data and semantics

Language is used both to communicate and to enhance thought; both communication and thought enhancements can be components of the creation of something new. (Steps 2–4 of Figure 7-3 constitute a thought process.) In this section we describe techniques we call "semantics" — techniques we can use to better understand the language we hear (or to better form the language we use).

We consider two types of language: affective language and report language. Affective language is language that conveys emotion: "Nothing is working here today; I could just scream." Report language attempts to describe what is actually happening: "This morning I dropped the coffeepot and splashed coffee all over the kitchen floor and cupboard doors; then, after I'd cleaned that up, I slammed my finger in the car door after putting my brief case in the backseat of the car." Everyday conversation combines both types of language and both types are valuable when we are trying to understand a situation. Affective language, however, is what we frequently hear (or use) first.

As illustrated in Figure 7-5, it is desirable to distinguish between

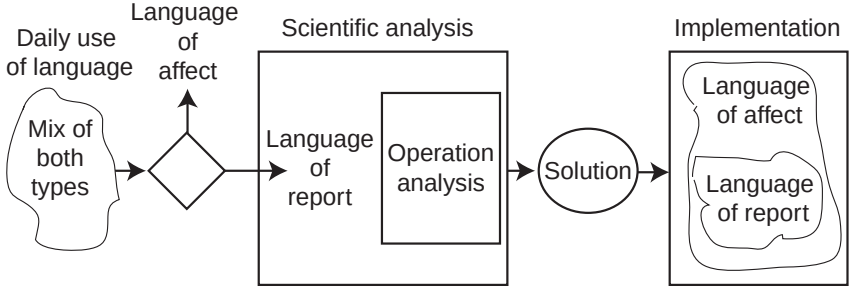


Figure 7-5. Affective and report language.

the affective language and the report language that occur in daily use. We want to note the report language that is already there; in addition, we need to dig down beneath the affective language to find the report-language basis for the affective expression. Then, with report language in hand, we can do scientific analysis to discover an appropriate operational approach. That solution can be stated operationally in report language, and then appropriate affective language can be added to appeal to the people who may have to carry out the implementation or whom the implementation may affect.

Three techniques derived from the study of semantics can help us turn affective language into report language,[1] as described in the following subsections.

Detecting and removing inference and judgment

One key task is detecting and removing inferences and judgments from language data. Reports differ from one another in how verifiable they are. Some statements are couched in terms of the "4Ws and 1H" (who, what, when, where, and how).[2] In principle, such statements can be (or could have been) corroborated by an observer; they are verifiable reports. Other statements represent assertions of facts not directly observed but deduced from closely related observed facts; these are *inferences.* Finally, some statements represent opinion, approval, or disapproval, based loosely, if at all, on observed fact; these are *judgments.*

Refinement of language data replaces judgments with inferences and inferences with reports. It means eliminating judgment (approval or disapproval) and moving toward fact. "He is not a good operator" may actually mean (applying the 4Ws and 1H) "The junior machine operator with one years' experience [who] skipped the second and third steps [how] of the standard operating procedure [what] on 11 April 2006 [when] while starting the number 3 machine of production line 1 in our headquarters plant [where]." Judgments often use evaluative words such as *poor*, *only*, *good*, *bad*, or *acceptable*, which imply comparison with the speaker's implicit standards. More subtle judgments are conveyed in comparative words, such as *too little* and *too much.*

The only acid test for inference is to ask whether what was reported

was literally observed. If it wasn't observed, it may have been an inference. Statements about states of mind ("He was melancholy") or intellectual potential ("He wasn't able to understand the design") are often inferences. Any statement about the future can't be a verifiable observation, so is most likely an inference ("The car won't start when we try again tomorrow"). Statements about hypothetical conditions ("If I had said so, he would have blown his stack") are often inferences.

In the appropriate contexts, judgments and inferences both can be useful, but initially facts are more important. Inference must be converted to fact. "He doesn't know how to operate his machine correctly" may actually mean, "He turned the valve left when the instructions said to turn it right."

Notice that a single judgment or inference may translate into more than one reported fact. But it is important for us to focus on the vital few important or symbolic facts.

Appropriately moving down (or possibly up) the ladder of abstraction

Understanding is very much a process of moving from low-level facts to higher-level concepts; well-understood concepts can be explained in terms of lower and lower levels of abstraction. If you speak at high levels of abstraction without having reasoned your way up from lower levels, then what you say is unlikely to be founded in fact, or understood by others.

A semantics concept called the *ladder of abstraction* can help you find the appropriate level of abstraction. The ladder of abstraction is critical to clear thought. S. I. Hayakawa provides an example of the ladder of abstraction referring to a cow, as shown in Figure 7-6 (start reading this figure from the bottom).

Work at the appropriate level of abstraction. It is not useful to speak at too low a level of abstraction — to say, for example, "I am sitting on a geometric arrangement of sticks, each of which is made of plastic or metal" when you mean "I am sitting in a chair." It is also not useful to speak at too high a level of abstraction; for example, saying, "I am sitting on a household asset" is unclear and ambiguous.

Controlling the level of abstraction is among the most difficult skills

Most abstract

Wealth ⇒	Very abstract, omitting almost all reference to Bessie's characteristics
Assets ⇒	Still more of Bessie's characteristics are left out
Farm assets ⇒	What Bessie has in common with other salable farm items
Livestock ⇒	The characteristics Bessie has in common with chickens, goats, and other farm animals
Cow ⇒	The characteristics that stand for the things we recognize as cows
Bessie ⇒	The name we gave to that particular object of our senses
Cow we perceive ⇒	What our senses abstract when we see the process that is a cow
Cow known to science ⇒	Atoms, electrons, and so on; i.e., the physical process that is the cow

Most concrete

Figure 7-6. Ladder of abstraction example. (Adapted from Hayakawa90, page 85.)

to acquire. Without an explicit clarification process, statements like "We have empowered our employees" often create the illusion that the senior executives share a common understanding. But one executive may mean, "90 percent of my people's suggestions are implemented," whereas another may mean, "I've officially told my people that I want them to make suggestions, and that should be enough." In terms of implications for action, these two understandings are very different. Without facts at a low enough level of abstraction, we risk understanding very little about important topics, whether such topics relate to customer needs or to what the competition is doing.

In the initial fact recording, start relatively low on the ladder of abstraction; only in later steps, when low-level facts are understood, should you build up to more abstract statements.

Avoiding two-valued statements in favor of multivalued statements

People have a strong tendency to use two-valued or 0-1 thinking ("It's a hot day"; "Boston Harbor is polluted"). The two-valued scale is very gross, and typically it is unclear what the boundary between the two values means: What exactly is the difference between "hot" and "cold"?

Two-valued thinking or speech, if used carelessly or deviously, can be a tool of rhetoric or demagoguery. It can simplify a situation to the point of nonreality. People often use two-valued statements for the purpose of dominating others or deluding themselves ("Our product is the best on the market and doesn't need improvement").

Multivalued thought and speech is the tool of those trying to understand a real situation and to initiate effective corrective action ("Our product has three features customers said they liked, two that they didn't like, and two to which they are indifferent"). Multivalued thought uses a scale with fine gradations and precise locations of the values.

Converting two-valued statements to multivalued statements is especially useful because two-valued statements often contain the germ of observable facts. Table 7-1 offers examples of this kind of conversion.

Table 7-1. Converting two-valued statements to multi-valued statements

Two-valued statement	Refined, multivalued statement
The day is hot.	It was 78°F at noon.
Customers love our product.	85% of customers surveyed rated our product as excellent.
We didn't follow our standard development process.	Last year 75% of projects reaching stage 3 didn't get stage 2 sign-off by the VP R&D, as our process requires.

7.4 Five-Step Discovery Process

Our Five-Step Discovery Process was illustrated in Figure 7-3 (p. 169). Let's now consider it in more detail.[3]

Steps 1 and 2: Intuitive perception of change and moving down the ladder of abstraction

In step 1 you arrive at an intuitive perception of a change in the situation. You then translate this perception into language that you can process. Then you move down the ladder of abstraction until you can articulate a factual statement in report language — which is step 2 (see Figure 7-7).

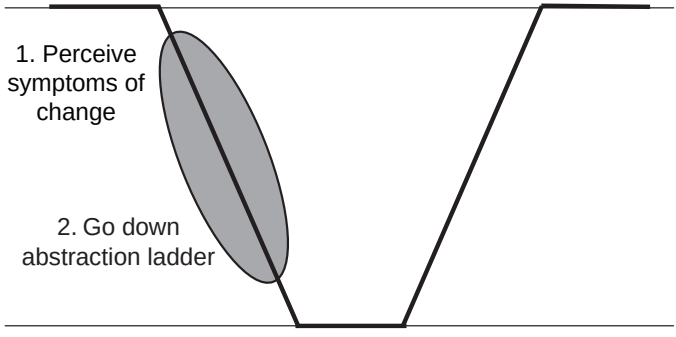


Figure 7-7. Moving from intuitive perception to report language.

There are four important techniques you need to employ in moving from the intuitive perception (step 1) to the report language (step 2):

A1. Be willing to accept whatever your intuition tells you.

Derive your following logic from your intuition. Convert your intuition to a language statement; for instance, in thinking about your organization you might come up with the statement,

There is not a clearly defined process in our organization.

This language statement is a form of opinion.

A2. Find past experiences that support your statement.

Reflect on your opinion from step A1 in terms of your past experiences.

B1. Focus on one critical, symbolically important, past case.

This case should be representative of your intuition and opinion. This is an important and useful way of representing a fact. State this symbolic case; for example,

The steps for improvement are not well defined.

B2. Apply the methods of semantics guided by the 4Ws and 1H.

Use the 4Ws and 1H (who, what, where, when, and how) to dig for detail, plow through emotion, and dissect inference and judgment to get to the underlying facts — to move down the ladder of abstraction and get appropriately specific. Applying the 4Ws and 1H to the sentence stating the symbolic case ("The steps for improvement are not well defined") could result in the following:

What? The statement of B1 referred to

The steps for improvement

If you knew the 7 Steps Improvement Process (a specific improvement methodology) was being used, the first part of the sentence could be rewritten

The 7 Steps Improvement Process

Where? This was not previously stated, but you might know that the existing documentation on the specific 7 Steps Improvement Process is

in the company's Quality Manual

When? You may be able to figure out that this has been a problem

over the past two years of use of the 7 Steps

Who? This may have been a problem for the company's

50 quality improvement teams

How? The symptom of the improvement process's being

not well defined

may be that

there is only one page and no examples in the manual.

Thus, your initial statement of the symbolic case ultimately might be restated as

> *We practiced the 7 Steps Improvement Process in 50 quality improvement teams for two years, but the Quality Manual had only one page with no examples to describe the process.*

With the focus from this specific statement, you typically will be able to address a real problem — for example, providing the company's improvement teams with good documentation of the well-known 7 Steps Improvement Process (Kume85) rather than putting effort into the wrong or a vaguely defined problem (such as seeking a better-defined improvement process). This highly specific statement of the symbolic case also can lead you to think about other parallel problem areas. For instance, perhaps many of the company's business processes have not been well documented, severely limiting possibilities for process improvement — it is hard to improve something when you don't have a clear picture of how it works.

Step 3: Moving up the ladder of abstraction

Step 3 of our Discovery Process is to go back up the ladder of abstraction. As shown in Figure 7-8, once we have our specific, factual statement of the

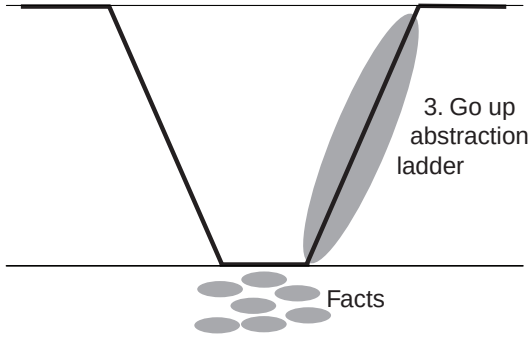


Figure 7-8. Moving from factual statement of symbolic case to concept/hypothesis.

problem we wish to investigate, a lot of facts are available to be collected. We need to abstract these facts into a refined concept/hypothesis. We need abstraction because the number of relevant facts (perhaps six or eight) often makes it hard to state a clear model, and abstraction lets us extract the common elements. Also, in the process of abstraction we often see hidden meanings and new relationships.

It is important to move to the right level of abstraction. For instance,

in Hayakawa's example (Figure 7-6), "livestock" is likely to be a better level of abstraction up from "cow" than "assets" or "wealth." Thus, we carefully go up the ladder of abstraction step-by-step, alternating *grouping* and *title making* as shown in Figure 7-9.

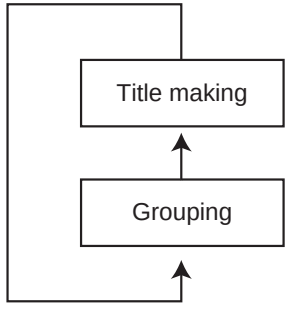


Figure 7-9. Repeated alternation of grouping and title making.

Both grouping and title making require development of considerable skill. Let's examine each activity.

Grouping is a process of placing "similar" statements of fact together. We must clarify how we see statements that are "similar." What we call "grouping" is different from "classification." Classification, which is what most people think of when they first attempt grouping, is a logical, semi-bottom-up process of categorizing based on an explicit or implicit top-down hypothesis. Grouping, as we mean it, is done without a prior hypothesis and is done intuitively, not logically. Grouping is based on images that come from the statements of facts rather than on the statements of facts themselves, and it is a totally bottom-up process of creation of something new.

Converting the statements of fact to images and then grouping the images is the hardest aspect of grouping to learn. A schematic diagram of the process is shown in Figure 7-10. The statements of fact are at the left of the figure in the "world of language." The person or people doing the grouping derive intuitive images such as those shown at the right in the "world of image." When converting a statement of fact to an image, try to avoid replacement *language statements* that come to mind. Instead try to create a visual image in your mind's eye without being too fixated

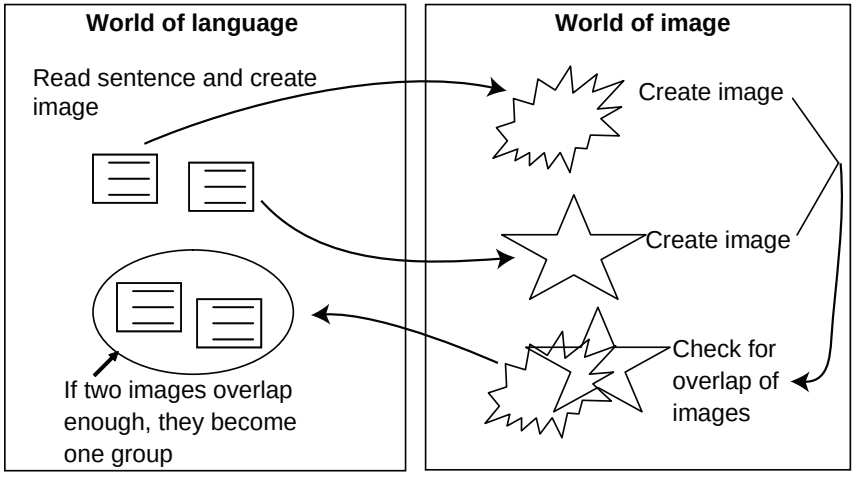


Figure 7-10. From statements of fact to images to a group.

on the details of the original statement — try to capture the essence of the statement in your abstract visual image without being too figurative. (It is better to creatively imagine in the way of the artist Joan Miró rather than in the way of Edouard Manet.) Create mental images of each statement of fact.

Next, select groups of two or three images that are intuitively similar. The number of elements in a group may never be more than three; having images that are part of no group is also OK (it is better to leave an item ungrouped than to force it into a group with other items that are insufficiently intuitively similar). These guidelines lead participants in the grouping activity away from the natural tendency to force not-so-similar elements together into the same group. Preventing premature grouping of elements leaves the ungrouped elements available for grouping (and creation of new ideas) later. Elements do not get hidden where they don't belong and thus distort grouping at one level and not contribute to grouping at another level.

Title making is the process of naming — choosing a title for — the group formed by combining up to three statements of fact based on their images. The title of the group is the abstraction of the content of the statements that were grouped by image.

Title making has a certain parallel with numerical abstraction, as shown in Figure 7-11. With numerical data we summarize using sta-

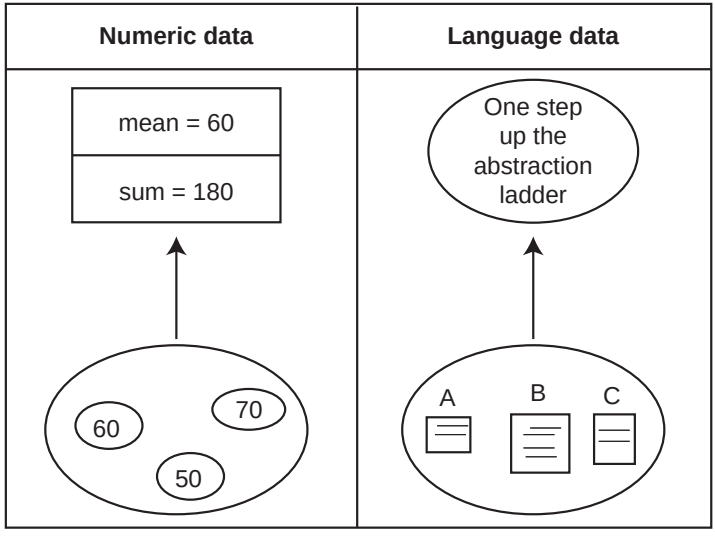


Figure 7-11. Parallel between numerical abstraction and group and title making of language data.

tistical measures such as mean and standard deviation, which show the location and shape of the distribution of the underlying numbers. With title making, the abstracted title for the group indicates something about the inherent organization of the selected underlying statements of fact.

Figure 7-12 shows the process of abstracting a title for grouped statements of fact. Suppose the group has the two statements shown on the "labels" at the top of the figure. First, we look for *words* or *phrases* that are the same or similar on all the labels in the group. For example, "top management" and "top manager" are found in both labels; we write these in part 1 of the worksheet. We do the same for the word "company."

Second, we extract the same *issues* or *concepts* from the statements. In the case of the labels on the example worksheet, "postponed" and "did not show up" are very similar and thus are written on the left side of part 2 of the worksheet. This may be done several times for the same statements: "self-assessment workshop" and "TQM kickoff meeting" also are similar

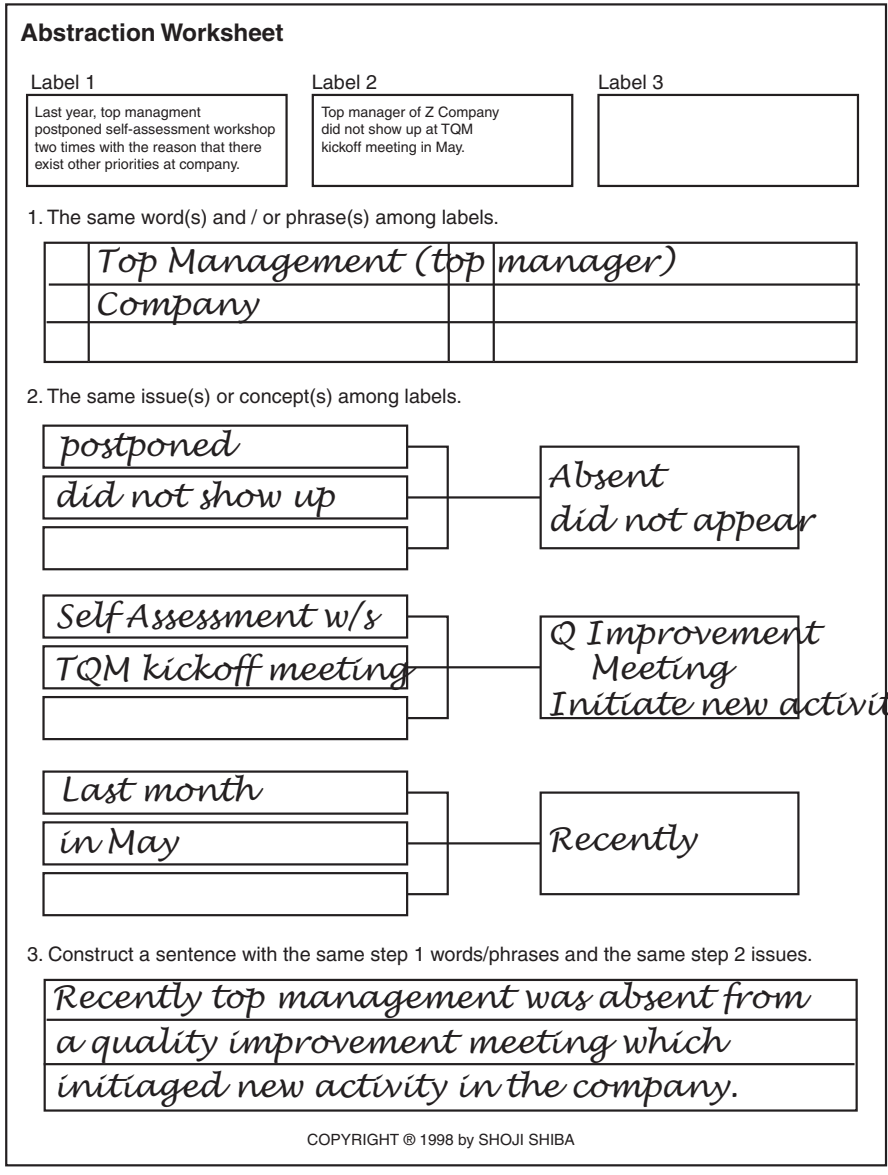


Figure 7-12. Abstraction worksheet.

phrases, as are "last year" and "in May." Then we abstract each issue (right column of part 2), being careful to move up only one level of abstraction. During each abstraction step, we are on the lookout for hidden meanings; for instance, "self-assessment workshop" and "TQM kickoff meeting" abstract to "quality improvement meeting," but the hidden meaning of "quality improvement activity" is "initiate new activity."

Third, we construct a sentence that captures the words from part 1 and the abstractions from part 2.

Step 4: Creation of a model/hypothesis

Once we have gone up the ladder of abstraction from the facts, it is time to create a hypothesis that hopefully contains new ideas (see step 4 in Figure 7-13) and provides a useful model.

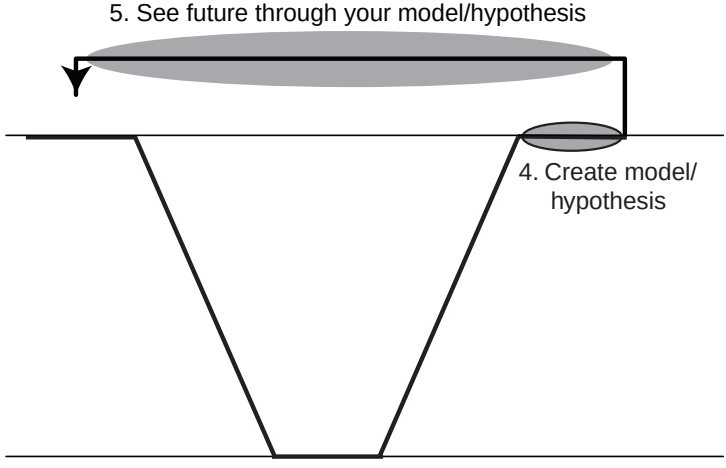


Figure 7-13. Creating a hypothesis and viewing the future through the hypothesis.

Modeling involves possibly discovering and then mapping the relationships among the elements involved in a hypothesis. It may involve the connections among the elements, any hierarchical or timing relationships among the elements, and the similarities and/or differences among the elements. Various methods can be used to discover the elements in-

volved in a hypothesis and appropriate to a model and the relationships among them, as shown in Figure 7-15.

Some methods of generating hypotheses and models are very weak; for example, brainstorming is often closer to an exercise in random opinion than to systematic analysis. We need to carefully choose the method appropriate to the situation, or perhaps we may decide to use a combination of methods.

For an example of modeling, look back to Jon Katzenbach's list of characteristics of real change leaders on page 108. We can convert the characteristics in the list into a system dynamics model (of the kind shown at the left side of Figure 7-15).[4] The resulting model of real change leaders is shown in Figure 7-14. This model shows two important causal loops: The upper cycle can be represented by the archetype phrase "challenging spirit," while the lower cycle can be represented by the phrase "concern for people." (Of course, this model is just an example; try creating your own model.)

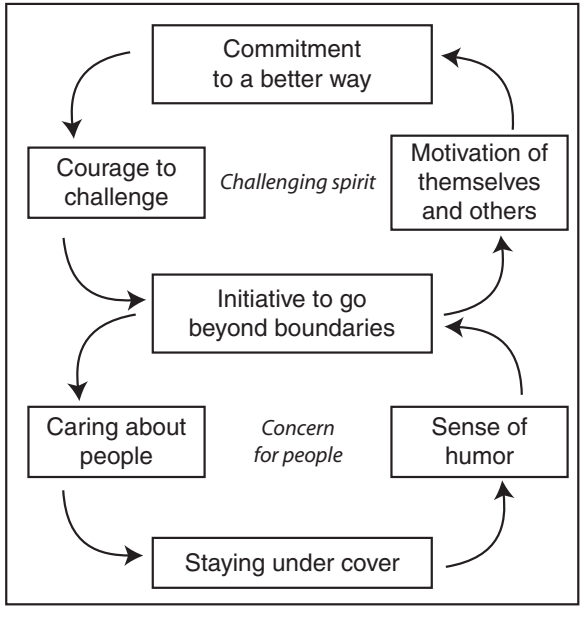


Figure 7-14. System dynamics model of characteristics of real change leaders.

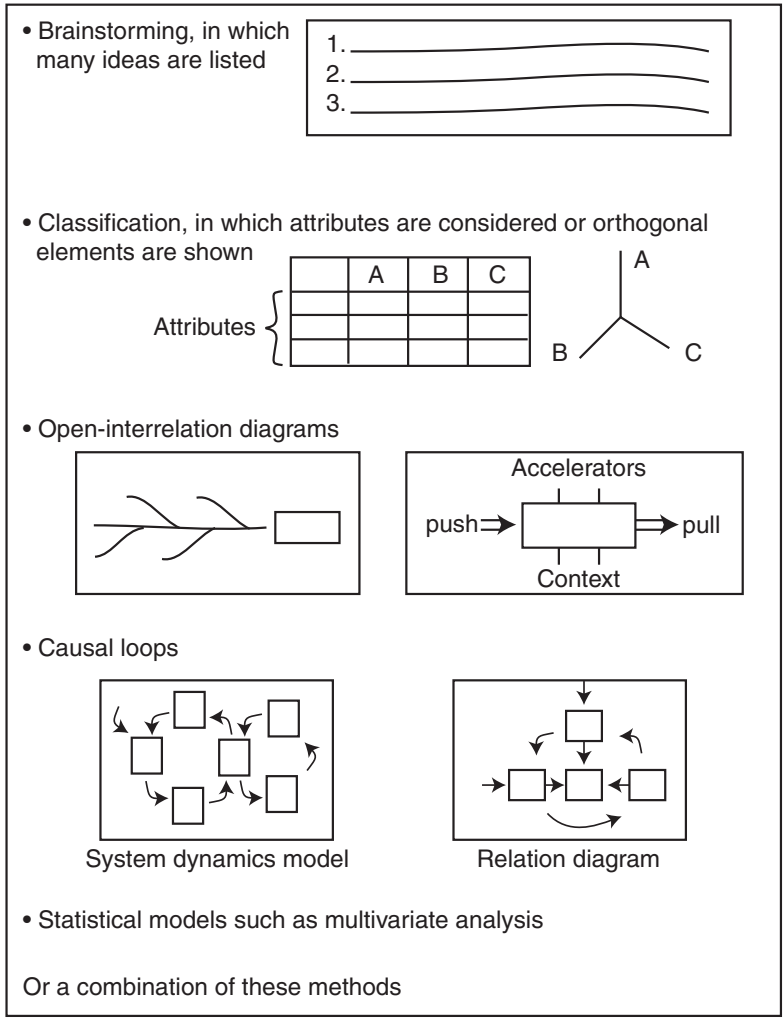


Figure 7-15. Methods used to create hypotheses and models.

With this model providing a bird's-eye view of what makes a real change leader, we will perhaps be able to discern other elements that are missing from the model — for example, ways to create or find real change leaders and ways to motivate the real change leaders. One of the key benefits of modeling is that missing elements are revealed from the model's bird's-eye view.

Step 5: Viewing the future through the hypothesis/model

In the last step of the process (step 5, Figure 7-13), we use the hypothesis or model from step 4 to attempt to see into the future. This is a well-known technique from system dynamics: If a model can be created that is consistent with the past, then it is likely to be able to predict how the current system will work going forward. In the fifth step of the Five-Step Discovery Process, we are not attempting to be fortune-tellers; rather, we use the model based on the hypothesis based on facts to reveal believable new possibilities. This is not as scientific as the system dynamics approach to showing how the current system will work under different scenarios. It is, however, a good process for driving our intuitions about the future in reasonably valid directions.

In Figure 7-16 we see a model created from the May 2002 perceptions of International MBA students at Fudan University of the biggest changes in Shanghai over the previous year. The model was derived using the Five-Step Discovery Process. (Table 1-1 on page 9 was another analysis using the same data from the perceptions of the students.) Had we made the Figure 7-16 model in 2002, we might have been warned about future possibilities:

1. The positive cycle (the upper part of Figure 7-16) has many elements, but the negative cycle (the lower part) has only one element.
2. The perceptions of the students mainly focus on the positive side.
3. But this leads us to wonder if the negative side is not being considered adequately. Negative outcomes may result from the increasing GDP and income, increased congestion of traffic due to motorization, and the inflow of many people (especially low-talented people).

Other possible negative effects may include changing social lives, bankruptcy among older businesses, and an increasing divorce rate.

By 2006, in fact, we see many of these hypothetical negative trends becoming reality.

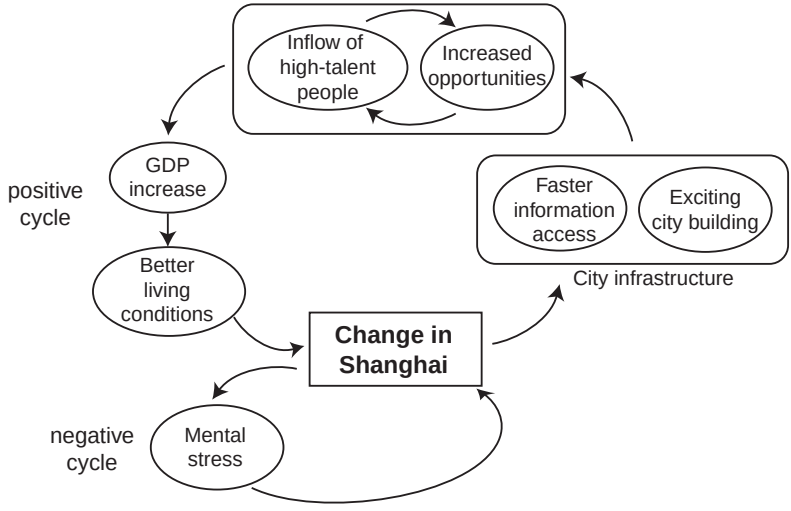


Figure 7-16. Model of change in Shanghai.

Reflections on the Five-Step Discovery Process

The Discovery Process we have described lets us bring many capabilities to bear on understanding a situation and coming up with a concept for the future:

- We use our brains in two ways — logically and intuitively, as shown in Figure 7-17.
- We make use of two kinds of data — image data based on intuition and language data based on logic, as shown in Figures 7-4 and 7-10.
- We use two kinds of processes — a disciplined five-step process for keeping the results plausible and to enable learning and improvement in the use of the process, and a creative process to permit unlearning and new learning to create new results and avoid logical

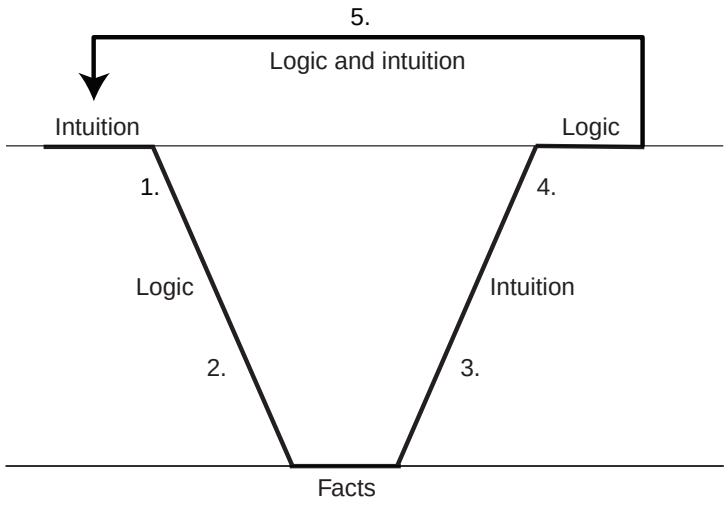


Figure 7-17. Logic and intuition in the Five-Step Discovery Process.

bias. Practicing these two kinds of processes will give us the skill needed to apply them with maximum benefit.

By bringing so many capabilities and skills to bear, we greatly improve our chances of finding a plausible new future.

Part IV: Patterns of Breakthrough

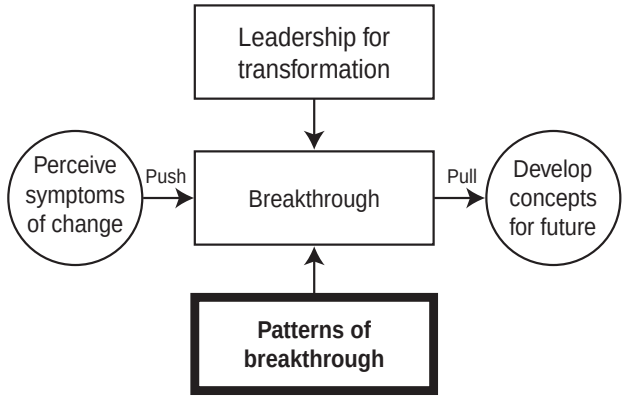


Figure IV. Part IV will explore patterns of breakthrough.

Chapters 3–5 described principles for leading organizational transformation. Thus, those chapters were slanted somewhat toward internal issues and internal structures of change, stated in terms of eight principles for visionary leadership. However, for many businesses breakthrough is required because of market issues — for instance, because of a mature or saturated market for the business's products or services. In this part of the book, we slant things somewhat toward issues of markets. We examine models for breakthrough that reveal how a new idea moves from the leader's head to an entrepreneurial group within the company and eventually into the market at large.

Chapter 8 uses two illuminating case studies to explore stages and cycles of breakthrough. Chapter 9 looks at obstacles and infrastructure issues that often face the innovative leader. And Chapter 10 considers community and social values as integral elements in breakthrough management. There is some commonality in the following chapters with what we described in Chapters 3–5. We will explicitly discuss this commonality in section 9.3.

Chapter 8

Stages and Cycles of Breakthrough

This chapter discusses stages and cycles that are common to many cases of breakthrough. Often, an organization's breakthrough story starts with a creative idea and passes through various states that eventually result in the organization addressing a new market. We can think of the stages as the time sequence of breakthrough. Over the course of each state a characteristic cycle occurs; we see the cycles as the evolutions of a creative thrust. The three stages of breakthrough are shown in Figure 8-1, and

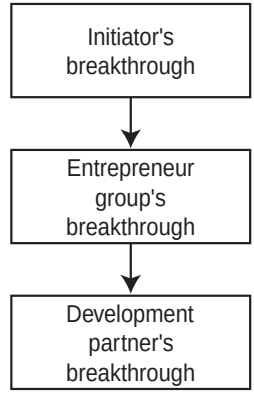


Figure 8-1. Stages of breakthrough.

cycles are shown in Figure 8-4 (on page 199). We use the case study of Teradyne Aurora to illustrate the three stages. We then present the Seiko case study and introduce the cycles of breakthrough.

8.1 Teradyne Aurora and three stages of breakthrough

Since 1960 Teradyne has made equipment to test electronic devices. By 1999 the company's sales had reached $1.8billion, and it had 8,000 employees. It was the world's number one supplier of Automatic Test Equipment (ATE) used in semiconductor manufacturing to verity silicon wafers and packed chips. Teredyne had testing businesses related to software, telephone, and PC boards and backplane assembly products. It had a strong Total Quality Management (TQM) culture.

According to Teradyne co-founder Alex d'Arbeloff, in 1993 some people at Teradyne took a look into the future. They noted that they lived in the Unix world but that in the outside world Windows NT was becoming a pervasive platform with thousands of programmers writing new inexpensive applications software. They also noted that they were still using ECL (emitter coupled logic) technology in their ATE products while some competitors were using CMOS (complementary metal oxide semiconductor) technology that allowed all of the required functions to be put on one chip. Alex d'Arbeloff found that even as co-founder and at the time chairman and CEO, he could not get the existing organization to work on either NT (which people claimed was incompatible with their existing software) or CMOS (which people claimed could not work at a high performance level).

As time passed, some progress was made but not enough. Engineers for one product line learned how to work with a hybrid of 90 percent CMOS and 10 percent time-critical circuits in ECL. Test systems from the small vendor ASIX were studied; these systems were fully implemented in CMOS, albeit not always with high levels of performance. NT continued to be ignored.

Some years earlier, d'Arbeloff had met Rick Meuthing at a trade show. Meuthing had been at ASIX but was now teaching VLSI design at a Boston area university. D'Arbeloff asked Meuthing if he wanted to help Teradyne invent an entirely new design for timing in CMOS. Hired as a consultant, Meuthing tried out an idea he had succeeded in demonstrating — the feasibility of a new CMOS design.

Marc Levine was software engineering manager for Teraydne's In-

dustrial Consumer Division until d'Arbeloff asked him to become the corporate TQM officer.[1] While visiting the VLSI division in California, d'Arbeloff and Levine met with several company VPs and engineering managers and discussed building a test system using CMOS and NT. All agreed that such a project was needed but no one felt able to take people off key existing projects. Thus, d'Arbeloff turned to Levine and asked if he could explore starting the CMOS/NT project within the company.

Levine prepared a short concept paper and discussed it with all the relevant VPs and all division technical leaders, getting widespread support. He then recruited one of Teradyne's most talented engineers, Hap Walker, who had background in hardware, software, and tester design. When Hap left the project he was leading to join Levine in building the new test system, Levine accepted the job d'Arbeloff had asked him to do.

Levine's concept paper had suggested that the CMOS/NT project should report to VLSI division head Ed Rogas, but d'Arbeloff and the top Teradyne management decided it should be a separate start-up. The enterprise would have its own board, consisting of d'Arbeloff, Jim Prestridge, Rogas, Levine, and Walker, and that it would be housed at a location separate from Teradyne's Boston headquarters. It would be known as the Aurora project.[2]

Levine and Walker created a product concept, and they visited non-Teradyne customers that used competitors' equipment. They confirmed the concept of medium performance at very low cost, use of CMOS and NT, and aggressive time to market. The board gave them approval to hire six more people to develop a full business plan.

D'Arbeloff next suggested that Levine, Walker, and Dan Proskauer (a software engineer) visit an application software manufacturer in which d'Arbeloff was an investor and for which he served as a board member. The Aurora team discovered that the manufacturer wrote its own software only in its core competency area; it acquired and assembled all other software at low cost from software catalogs of Windows applications in Excel, Visual Basic, and so on. After considering this approach Proskauer concluded that Excel would be a flexible user interface, which the Aurora team would not have to write from scratch and which would support user-written applications in Visual Basic.

A 67-page business plan was written. The plan was to bring out a new CMOS/NT product with breakthrough pricing, operating cost, and so on, thus enabling Aurora to tap into a large market (although different development partners would be required for different market segments). The Aurora project was established at a separate location in suburban Boston with a simple organization and small staff.

By August 1996 the project was well under way, and team members were giving demonstrations to potential customers and to senior management throughout Teradyne. Aurora began to work closely with development partners. The Aurora team consulted with the development partners well before other customers were told about the project, and the development partners had considerable influence. These partners provided detailed information on how they did testing and on the capabilities they needed.

Getting the necessary staffing remained difficult. A Teradyne-wide hiring freeze was on (in anticipation of a general turndown in the semiconductor industry), and other parts of Teradyne understandably did not want their best people taken. For this and other reasons, the Aurora people had to narrow their plans and focus on getting a prototype done and a lead user on board. Aurora also took advantage of central engineering services of the existing sales force of one Teradyne division.

In 1998 Aurora's new breakthrough product emerged — the Integra 750. It was a fraction of the size and one-fourth the price of products using the prior technology and was as easy to use as Microsoft Excel. Its performance was matched to that of other products at the low end of the market, such as microcontrollers.

Figure 8-2 illustrates the sequence of three typical breakthrough stages and the essence of each stage:

- The initiator's breakthrough is sensing the problem or opportunity, coming up with the new *idea*, and resolving to push ahead with the idea.
- The entrepreneurial group's breakthrough is demonstration of the *technical* (or operational) *feasibility* of the concept.
- The breakthrough with the development partners is demonstration of the *market feasibility* of the product.

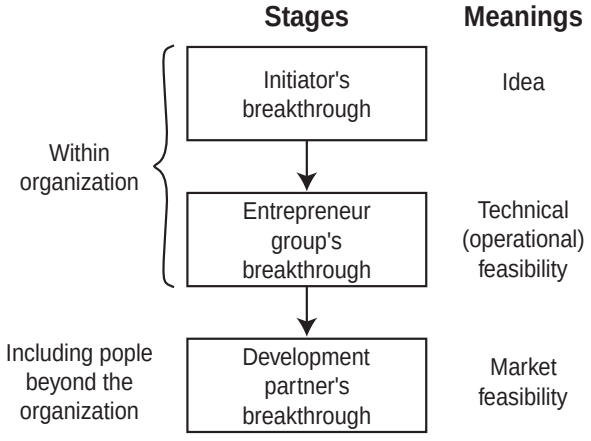


Figure 8-2. Breakthrough stages and their meanings.

The first two breakthrough stages happen within the organization; the third includes people from outside the organization. The Teradyne Aurora case study exemplifies all three stages. Let's review what happened in each one.

1. Initiator's breakthrough

The initiator at Teradyne, Alex d'Arbeloff, came to his mental breakthrough by sensing the strategic situation, studying and using benchmarking to explore further, conversing with groups of people who were looking ahead, and ultimately confirming in his own mind the direction he was considering. There are several notable aspects of d'Arbeloff's breakthrough journey.

First, d'Arbeloff had the inclination and concern — paranoia, to use Andrew Grove's word (Grove99) — to look ahead and to try to project Teradyne's future position. He was well positioned to study future possibilities: He himself had a high-tech background; he was a CEO with great commitment to his company and its future; and he had outside information sources — for example, from other companies in which he personally invested. All this led him to the *idea* for a new business area.

Also, because d'Arbeloff was willing and well connected (with people

and companies), he was in a good position to further explore his idea. D'Arbeloff didn't only study in the abstract; he also spent real money and time and, in particular, was able to try out his idea on people whose capabilities were well known to him. Thus, he was able to risk making a *decision*.

The key step in the initiator's breakthrough, after the initial conception of the idea, is deciding to go ahead and to choose someone to lead the effort — the *project leader*. Alex d'Arbeloff made this decision even in the face of little support from the existing organization. He started by taking a key person with great skill from the existing organization; d'Arbeloff was willing to share the direction of the new initiative (i.e., to be informal partners in the new venture) with the project leader, Marc Levine.

Finally, d'Arbeloff made the further decision to involve only a few people rather than the entire existing organization. The initial partners and core leadership team in this venture were d'Arbeloff himself; Marc Levine, with whom d'Arbeloff had a good relationship; and the highly capable *key team member* Hap Walker, with whom Levine had a strong bond. Among them the members of this team had a great span of experience, knowledge, and capability.

The steps in d'Arbeloff's breakthrough journey suggest a model for initiating breakthrough, as shown in Figure 8-3.

2. Entrepreneurial group's breakthrough

Having been recruited to the new venture because they were some of Teradyne's best engineers, the members of the Aurora entrepreneurial group conceived a new product and plan, benchmarked it, gained confidence in their conception, and ultimately created a compelling new concept.

Then the entrepreneurial group actually developed the product by creating a detailed business plan and applying essential human resources along with physical and mental independence. They were open about the project with the rest of Teradyne, somewhat reducing possible threats from pieces of the parent company.

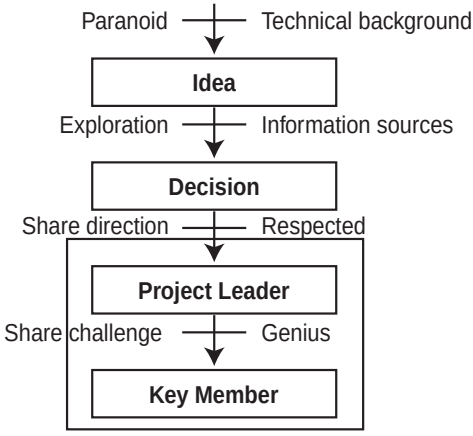


Figure 8-3. Elements for initiating breakthrough.

3. Development partner's breakthrough

Breakthrough in bringing Aurora's new product to market included focusing on a limited target, creating development partnerships with a small number of companies, capturing the necessary information from these development partners, and focusing again on key features.

We see this same pattern of stages of breakthrough (Figures 8-1 and 8-2) in other cases we have studied. Recall, for instance, the FAVI case study from section 4.1. At FAVI Jean François Zorbist first got the idea for a new management system from his success in fixing his lawn mower. Next Zorbist engaged his management team and FAVI's other employees in his breakthrough approach to management. Eventually, FAVI's customer-partners were integrated into the system via FAVI's minifactories dedicated to each customer.

The NIMS case study from section 5.2 provides another example of the stages of breakthrough, but in this case the progression occurs in the more intangible direction of expanding human potential rather than in a market, as shown in Table 8-1.

Table 8-1. Key factors for breakthrough

First stage — introduction of a new paradigm

- Uchimaru's philosophy
- introduction of Total Quality Control
- mental breakthrough

Second stage — creation of a new systematic engineering process

- phased design process

Third stage — developing new human capability in the engineers

- development of a feeling for problem identification and avoidance

8.2 Cycles of breakthrough and Seiko

A couple of patterns are implicit in the Teradyne Aurora case study. First, the initial idea, the decision to proceed, and the decision as to how to proceed all are arrived at early and in the face of great uncertainty and vulnerability (Alex d'Arbeloff was all alone at this time).

Second, the Aurora case study shows how people often have to overcome a *series* of mental blocks and must achieve a *series* of mental breakthroughs before a new technology is fully deployed. As shown in Figure 8-1, at Teradyne Aurora there was a breakthrough on the part of the initiator, d'Arbeloff, about the need for a new product; a breakthrough by d'Arbeloff's entrepreneurial team made it possible to develop the product; and a breakthrough with development partners helped bring the product to market.

A deeper reading of the Teradyne Aurora case study and the analysis in the previous section reveals that each stage involves a cycle, as shown in Figure 8-4. In each cycle those involved must somehow find the dedication (D) to seek breakthrough, attain the conceptual or mental (M) breakthrough, and then make the necessary technical (T) breakthrough. This and the next section discuss this breakthrough cycle in detail: We begin with the case study of Seiko (in this section), then illustrate the breakthrough cycle in terms of that case study, and finally review how this cycle model also matches the Teradyne case study.

In 1989 Nobuyoshi Kambe was appointed head of Seiko's Sports and

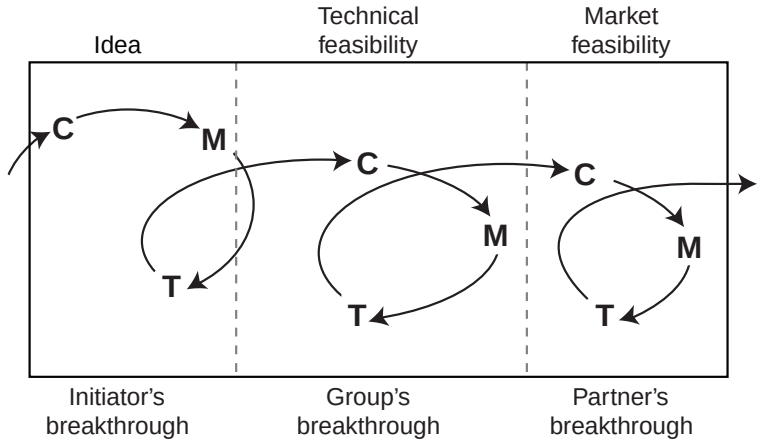


Figure 8-4. Each breakthrough stage has a cycle.

Leisure Products Division. At the time of Kambe's appointment, the division was in dire straits: Sales were low ($30 million a year), the division was running a deficit ($3 million a year), and it had high inventories and high costs. Seiko's CEO told Kambe to return the division to profitability within three years.[3]

Kambe got permission from the CEO to do something drastic to turn the business around, even to change the basic nature of the division's business. In the end, the business turnaround hinged on the development of what became one of the most popular golf clubs in Japan — the "S-Yard." Between 1993 and 1996, the reinvented division sold half a million of these clubs; sales revenue in 1996 was $120 million.

The division's journey to recovery involved the following three steps:

- Reducing personnel
- Setting an ideal future
- "Swimming with the fishes"

Nobuyoshi Kambe began by shaking up the division personnel. As shown in Figure 8-5, one-third of the division's people were transferred to other divisions of the company, and one-third were encouraged to take early retirement. Half of the departed employees were then replaced by people newly recruited into the division. Thus, when the personnel

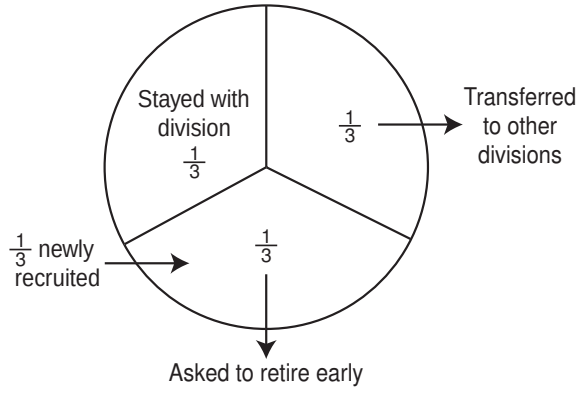


Figure 8-5. Change of personnel at Seiko's Sports and Leisure Products Division.

transition was done, two-thirds as many people were employed in the division overall, and only half of these had previously been in the division.

Next, Kambe and his people decided that their ideal future was to develop original and attractive new products, breaking with their traditional business of selling imported sporting goods, particularly sports-related clocks and watches. In other words, they decided that their ideal future involved freedom from traditional Seiko products (see Figure 8-6).

In breaking with traditional Seiko products, they looked at high-volume markets such as fishing, skiing, and golf. They chose golf as their focus. Finally, they jumped into the "fishbowl" of the market, using "voice of the customer" methods to invent the special new type of golf driver from which they obtained the great business success already mentioned.

From their "swimming with the fishes" exercise, Kambe's division learned that the market could be divided into two important segments: golfers under 50 years of age and golfers 50 years of age or older. The top three priorities of these two market segments are shown in Table 8-2. Japanese golfers under 50 cared about straight shots, distance, and having a brand name club. Golfers 50 and older didn't care about brand name; even though they had lost much of the power of their younger years, they still wanted the distance and accuracy that would let them compete with younger golfers.

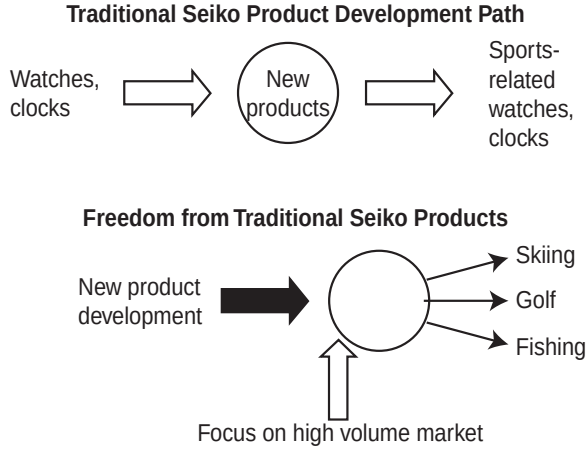


Figure 8-6. Breaking with traditional Seiko products.

Table 8-2. Seiko's "voice of the customer" findings using the fishbowl principle

Popularity	Younger than 50	50 or older
1st	No hook, no slice!	More distance; I want to compete with younger players!
2nd	More distance!	No hook, no slice!
3rd	I want to have a golf club with a famous brand name.	I don't care for any brand name.

This data from the fishbowl provided an opportunity for Kambe's division and a development team, without significant golf experience, to design a new type of lighter-weight golf club for golfers 50 and older. The characteristics of this club are shown in Figure 8-7.

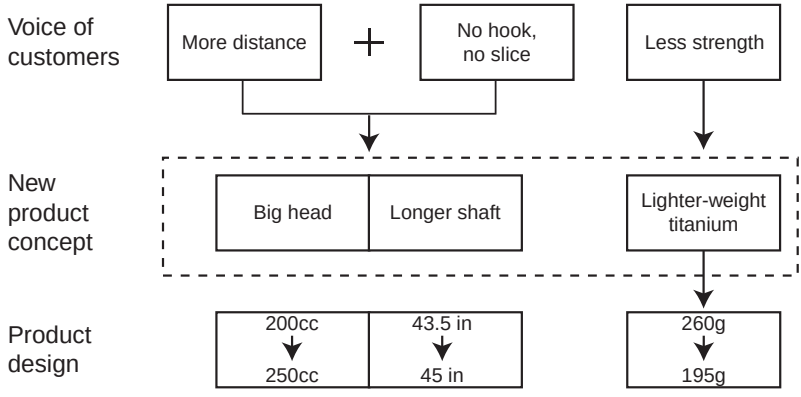


Figure 8-7. New golf club concept at Seiko.

8.3 Components of the breakthrough cycle

We next present a model of the crucial components of the breakthrough cycle. Shoji Shiba began to develop this model as he worked to understand Russell Ackoff's concept of Idealized Design (Ackoff81).[4] Shoji Shiba first listed key factors for breakthrough, as shown in Table 8-3.

Table 8-3. Key factors for breakthrough

1. Some event brings about a *dedication* to breakthrough.
2. A *mental breakthough* is achieved.
    a. Past tradition or practices must be unlearned.
    b. Creative chaos is created to push mobilization.
    c. A symbolic mental model (of success) is available to pull the mobilization
3. A *technical breakthrough* is achieved. The scientific method and tools are used to make the change.[5]

Shoji Shiba was also aware of the "process for creativity of Eizaburo Nishibori."[6] Combining the key factors for breakthrough with the creativity process suggested the three-phase "cycle" for breakthrough we described earlier — a cycle involving dedication, a mental breakthrough, and a technical breakthrough, as shown in a straight-line format in Figure 8-8.[7]

In this section we will first see how the Seiko and Teradyne Aurora cases fit the cyclical model. We'll then look more closely at each of the three components of the breakthrough cycle.

Seiko, Teradyne Aurora, and the model

The model of breakthrough shown in Figure 8-8 is a good match to the Seiko case study. First, Nobuyoshi Kambe's group was in serious trouble. They had a crisis that gave them the *dedication* necessary to make a real change. Next, the group broke free from the *mentality* of Seiko's traditional approaches. They swept away much of the old culture of the

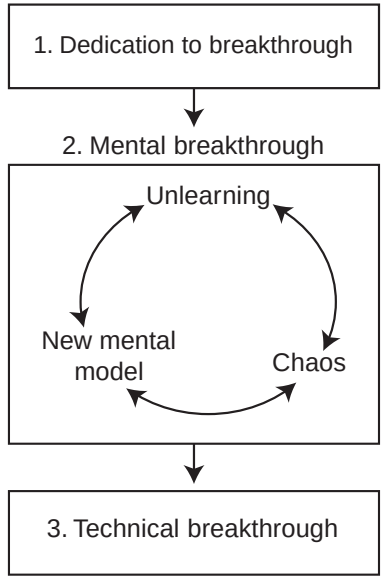


Figure 8-8. Elements of the breakthrough cycle.

organization through a massive personnel change, and they envisioned an ideal future involving original and attractive new products. With a strong motivation, and with their ability to separate from the past (unfreezing prior conceptions) and their vision of a new future, they had the discipline to use specific voice of the customer methods to make a *technical* breakthrough that provided a route to new business success. They also selected people for the team who were golfers, and thus better able to hear what the customers had to say.

An interesting observation is suggested to us by the Seiko case study — the idea that it is easier to make a breakthrough in business than in science and engineering. Significant aspects of business strategy are conceptual; a leader can sense a possibility for a new direction that customers may accept, try to go there, and perhaps succeed. Science and engineering, however, must more often live within the constraints of the physical rather than the conceptual world; typically progress in science and engineering is incremental, and real breakthroughs are rare.

The Figure 8-8 model also a good match to the Teradyne Aurora case. In fact, in the Teradyne Aurora example, we get a hint of repeated cycles as in Figure 8-4:

- Alex d'Arbeloff foresaw the potential crisis and opportunity and had the necessary dedication. He unlearned by looking and talking outside the company and had the insight that it was time to use CMOS technology. He worked with Rick Meuthing to demonstrate technical feasibility. This was the initiator's breakthrough cycle.
- D'Arbeloff next recruited Marc Levine, who in turn recruited Hap Walker, creating the beginnings of an entrepreneurial team dedicated to creating something new. A new entity was set up, both creating chaos and contributing to unlearning. The Aurora team's unlearning was furthered by visits to non-Teradyne customers that used competitors' equipment and by a visit to an application software manufacturer. As a result, Levine and Walker refined a new product concept (mental model), which they then tested for technical feasibility. This was the team's breakthrough cycle.
- And the cycle of dedication, mental breakthrough, and technical breakthrough repeated again with Aurora's development partners.

Dedication

The dedication necessary to launch the cycle will come from different sources for different people. Dedication often springs from something other than rational reasoning. Alex d'Arbeloff in the Teradyne Aurora case appears to have found the necessary dedication because *(a)* he had responsibility for the future of the company, *(b)* he feared for the future of the company, and *(c)* he likes new technology.

There are different levels of personal engagement when a person is faced with problem to solve.[8] For instance, we might describe someone as:

Attending: The person attends the meetings but doesn't really apply his or her mental powers to the problem.

Involved: In addition to being present, the person applies his or her mental powers to the problem, but only passively or in reaction to the work of others. The person does not bring to the process his or own initiative for solving the problem.

Committed: The person sees the problem and understands its importance; he or she is willing to take the initiative to solve the problem, including proposing original ideas, but the problems is still "just a job" to be thought about rationally and solved. The level of engagement does not go beyond applying time and (rational) intellect.

Dedicated: We define someone at this level as a person "on a mission" — a person who will not be stopped by the rational limits of time or thought — a person who puts his or her whole being, conscious and subconscious, into the problem until it is solved.

Here is an example of "rational commitment" versus "irrational dedication": A normal business manager working on an incremental improvement project may apply himself or herself to the improvement project while still keeping a sensible balance between work life and home life. This is typically acceptable in the case of incremental improvement. However, it is not enough for creating and leading breakthrough. A typical CEO of a start-up company feels that "my business is my life." Such CEOs do not balance; parts of their private lives are subsumed in their business life, and other parts are pushed out.

Another example involves risk and hedging. In many cases, once a person identifies a risk, he or she immediately may think about how to hedge the risk. This is a completely sensible (rational) mentality. Once again, however, breakthrough may need more. Many leaders of breakthrough take risks without hedging. They just "know" that their way is the "right" way and that success requires their willingness to give everything to the challenge.

Shoji Shiba notes that in Japan they call such a totally dedicated person a "crazy" person, with "crazy" being an adjective of respect. Perhaps this is similar to the expression "mad for the music," as Irish traditional musicians say. As when a person is "crazy in love" with someone, the breakthrough leader is "crazy in breakthrough" with the potential new business.

Shoji Shiba calls this concept of breakthrough management Theory Z (craZy). Rational thinking tends to lead to objective behavior, and objective behavior tends to relate to the direct interest of one's own business. But human beings have a wonderful ability to work on endeavors beyond their own interest — to work to change the world. This kind of efforts is "crazy." Recall principle 1 on page 45: Identification of the transformational need comes from a societal perspective rather than from the leader's own business interest. Such craziness is the key element for breakthrough.

Steven Levy, in his book *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Levy94, p. 58), described seeing the Macintosh computer two months before its public unveiling in 1983 and reflected on its later impact.

> I . . . met the people who created that machine. They were groggy and almost giddy from three years of creation. Their eyes blazed with Visine and fire. They told me that with Macintosh, they were going to "put a dent in the Universe." Their leader, Steven P. Jobs, told them so. They also told me how Jobs referred to this new computer: Insanely Great. . . .
>
> Very few tools transform their culture. Macintosh has been one of them. . . .
>
> Macintosh has become a symbol of a sort of intellectual freedom, a signifier that someone has logged into the digital age. . . .

> It took some time for people to see the light, but now it is everywhere: the ideas of Macintosh no longer belong to the future; they dominate the present. And they will shape the way we cope with the future. Macintosh has set a process into motion that will eventually change our thinking about computers, our thinking about information, and even our thinking about thinking. In terms of our relationship with information, Macintosh changed everything.

Mental breakthrough and the role of unlearning

Returning to Figure 8-8, the mental breakthrough component of the breakthrough cycle is the key to the technical breakthrough that culminates the cycle. Dedication alone is not enough.

The three elements of the mental breakthrough are not a cycle. Some uneasiness about the current situation can bring a feeling of chaos, or the chaos can be artificially introduced as in Seiko's big personnel change. Either way, there can be pressure to unlearn some of what seems traditional in the business and to find a new mental model. In turn, unlearning can lead to a feeling of chaos (or real chaos) and the possibility of a new mental model.

Ultimately, however, unlearning is the key to a new mental model; and there can be much past learning that gets in the way of unlearning and finding a new mental model. Table 8-4 lists three important areas of knowledge that need unlearning. And Table 8-5 presents five rules that "may even help you to win a Nobel Prize" from Nobel Prize Winner Leo Esaki who won the prize for his work with transistor tunnel effects; Esaki called them "rules" but emphasized that "they do not comprise all of the 'necessary and sufficient' conditions for success. They are merely suggested guidelines."[9]

Table 8-4. Three important areas that may need unlearning

- Your cultural or functional background
- Your past experiences (which can be dangerous because there is a natural tendency to feel that what worked for you in the past will work again in the future)
- Your current business

Table 8-5. Leo Esaki's "Five Don'ts which anyone with an interest in realizing his or her creative potential should follow."

1. Don't allow yourself to be trapped by the constraints of your past experience.
2. Don't allow yourself to become overly attached to any authority in your field.
3. Don't hold on to what you don't need.
4. Don't avoid confrontation.
5. Don't forget your spirit of childhood curiosity.

Sometimes people try to be creative (that is, to achieve a breakthrough) simply by jumping to new ideas without study. As shown at point a of Figure 8-9, this typically doesn't lead anywhere. A more useful approach can be seen at points b, c, and d in the figure. Deep study with experts in an area (point b) leads to increasing creativity in the area. Then (point c) a person makes a break with the discipline and creativity of that area (this is the "unlearning" element in Figure 8-8) and seeks new creativity in a new area. In using this approach to try to break through from an existing business area into a new business area, one might begin with discipline and deep study of the potential new area (point b), then make a break with that conventional understanding of the new business area (point c) and seek new creativity in that new area (point d).

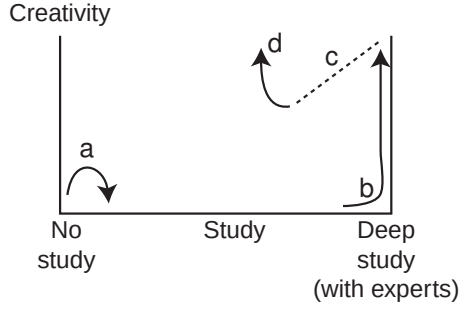


Figure 8-9. Approaches to creativity.

For example, the renowned painter Edouard Manet (recall the discussion in Chapter 6, and in particular Figure 6-17) apparently always had an urge to break with the traditional style of painting in the artistic era into which he was born. However, Manet studied with a traditional teacher, gained "practical experience," and traveled around Europe, not to

> discover the latest movements in contemporary art, but to copy the Old Masters . . . in major museums. . . . Manet would shake up the art world and change it forever, but first, as a student, he had to take possession of the greatest European art of the past. (Meyers05, p. 11)

He built his skill and awareness of old methods and new potential until, in good time, he broke with the traditional and conventional rules and created a new style of painting (in the face of much opposition) that eventually earned him recognition as one of the great artists of all time.[10]

8.4 Cycles and stages of NIMS and Maeda

Now look again at Figure 8-8 and then look at the earlier rendering of that cycle in Figure 8-4. We can definitely see these cycles within the breakthrough stages in the Teradyne Aurora and Seiko case studies. Furthermore, we see this same sort of repetitive cycle pattern in other case studies we have looked at. For instance, the key improvement cycles of the NIMS case study shown on page 112 of Chapter 5 can be redrawn as shown in Figure 8-10 on the next page. It is also easy enough to see the cycle pattern in the Maeda case study, starting on page 103 of Chapter 5 as shown in Figure 8-11.

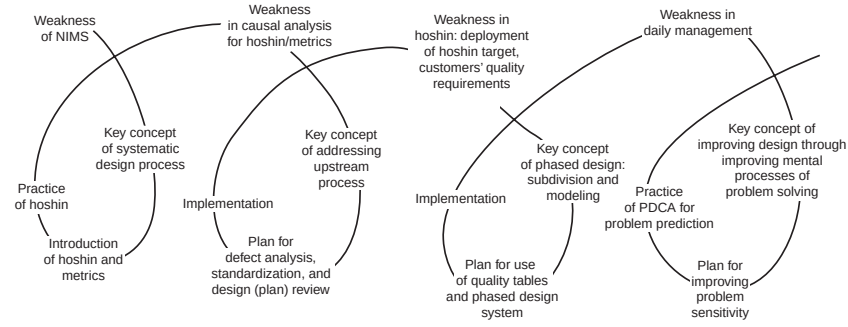


Figure 8-10. Improvement cycles at NIMS.

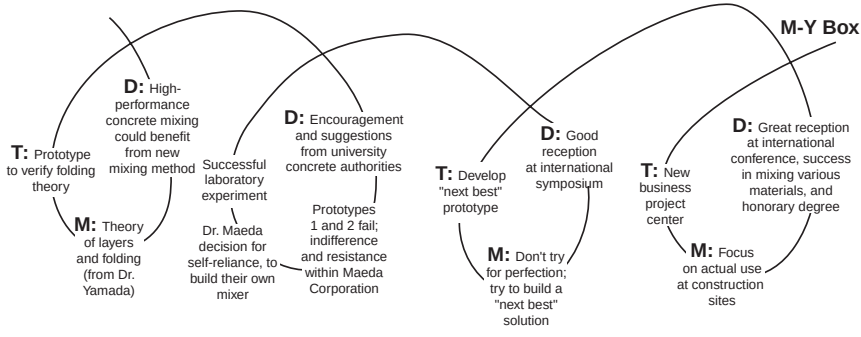


Figure 8-11. Breakthrough cycles at Maeda Corporation.

Chapter 9

Obstacles and Infrastructure

We have mentioned often that the leaders of breakthrough change are bound to face resistance and hurdles of many kinds. There will be inertia, entrenched ways of doing things, fear of the unknown, and countless practical difficulties. This chapter will discuss the phenomenon known as "the innovator's dilemma," infrastructure issues, ways to address various challenges inherent in market versus organizational breakthroughs, and the potential conflicts between incremental and breakthrough change.

9.1 The innovator's dilemma

In the Teradyne Aurora case study of Chapter 8, an existing division of the company was offered the opportunity to take on the new project, resulting in the following responses:

> What if the new technology doesn't work? We can't afford to bet the whole division on this. [General manager, Division A]

> I don't think the low-end market is a good business. It is much smaller than our current market, and I bet with a low-cost product, our margins will be low. [Financial controller, Division A]

> We cannot afford to take on the new project. Our key resources are tied up on our next-generation higher-performance product. [Engineering manager, Division A]

> In this business, keeping your current customers is key. We need to do what our large customers are asking for. [Marketing Manager, Division A]

These comments are typical of reactions to breakthrough ideas in existing organizations — and they represent a phenomenon known as the *innovator's dilemma*.

We recommend that you read *The Innovator's Dilemma* by Clayton Christensen of the Harvard Business School (Christensen97). Professor Christensen makes the following argument which we paraphrase here.[1]

> Good business practice is to observe competitors carefully, listen empathetically to customers, invest strongly in new technology, and focus investment and technology on the most profitable products. Such good business practice, unfortunately, ultimately can weaken a company, even a great company.

There is an important distinction between what Christensen calls "sustaining technologies" and what he calls "disruptive technologies." Sustaining technologies improve the performance of existing products or product families (see top of Figure 9-1), often based on process improvement. Disruptive technologies can damage the demand for existing

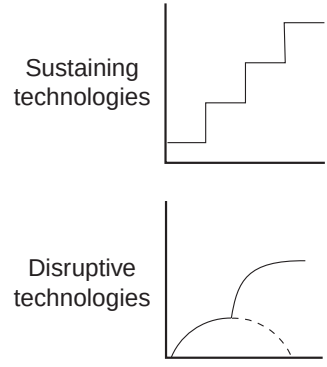


Figure 9-1. Sustaining versus disruptive technologies.

products or product families by bringing to the market a different value proposition — typically for a product that is cheaper, smaller, more convenient to use, and so forth, and perhaps apparently less profitable. In one historical sequence of disruptive technologies, the minicomputer seriously changed the market for the mainframe computer, the workstation more or less wiped out the minicomputer market, and the personal

computer grabbed important parts of the workstation market. Exploiting a disruptive technology tends to demand a change in business, as shown at the bottom of Figure 9-1.

Unfortunately, companies often have trouble taking a chance with disruptive technologies:

- New technologies often outdistance market demand. Many of us have participated in new product development and introduction efforts that overshot their anticipated markets and made few sales. This is especially true for sales to the mainstream market.
- Betting on a disruptive technology flies in the face of "rational financial decision making." A cheaper product means lower margins. Being the first to go into a potential emerging market is risky. The product based on the disruptive technology seems to ignore the voice of the most profitable customer segment, which isn't interested in it. In general, betting on a disruptive technology seems to ignore the needs of the customers and investors on whom a company depends.
- Many successful companies seek growth rates of 20 percent per year, which means that a $5 billion company would need a billion-dollar growth in its total business the following year. Small, possibly emerging, markets don't address such growth needs of large companies.
- Most successful business executives have learned to manage innovation in contexts where analysis and planning are feasible; that is, in contexts based on incremental changes in sustaining technologies. However, "sound" market research and "good" planning processes are not feasible when applied to disruptive technologies.

For all these reasons, many high-performing companies, which depend on customers and investors for resources, have well-developed systems (e.g., hurdle rates for investments) that kill disruptive technologies (sometimes explicitly but implicitly if not explicitly), making investing resources in disruptive technology difficult. And by the time the wisdom of investing in a disruptive product becomes apparent, it is too late — an upstart has disrupted or destroyed the market for a sustaining product line.

The real meaning of the innovator's dilemma is illustrated in Figure 9-2, where we see the anticipated results of continuing (sustaining) in the same business (A), the possibility of a new, disruptive business (B), and what could happen (A′) to the sustaining business if the disruptive business does develop. At time t1, the comparison between A and B very much seems to favor A; however, if the disruptive technology develops, then at time t2 path A looks pretty bad compared to path B. The question is whether the disruptive business B will be done by us (in which case we will have the chance of having an even better business by time t2 in return for forcing path A′ to happen ourselves, or whether someone else will follow path B, making path A′ a catastrophic result for us. If our products are going to be supplanted, we must be the ones who cannibalize them.

9.2 Infrastructure

There must be an infrastructure to support and protect breakthrough because breakthrough projects within an existing organization are fragile and easy to kill; often, in fact, you can't find anyone in an existing organization who thinks a new concept should be worked on. Such an infrastructure system, as shown in Figure 9-3, is needed to protect and accelerate breakthrough projects. Notice that the stages and cycles of breakthrough from the previous chapter — Figure 8-4 — are embedded in the infrastructure diagrammed in Figure 9-3. Let's look at the four

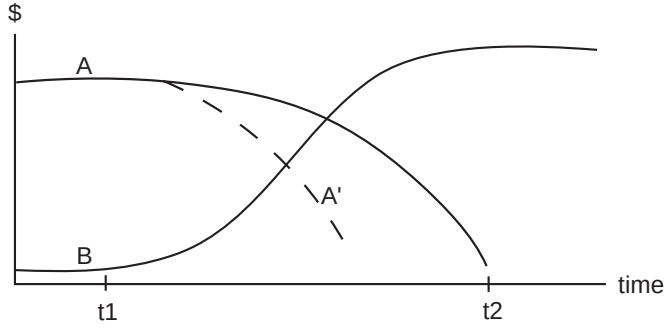


Figure 9-2. The real meaning of the innovator's dilemma.

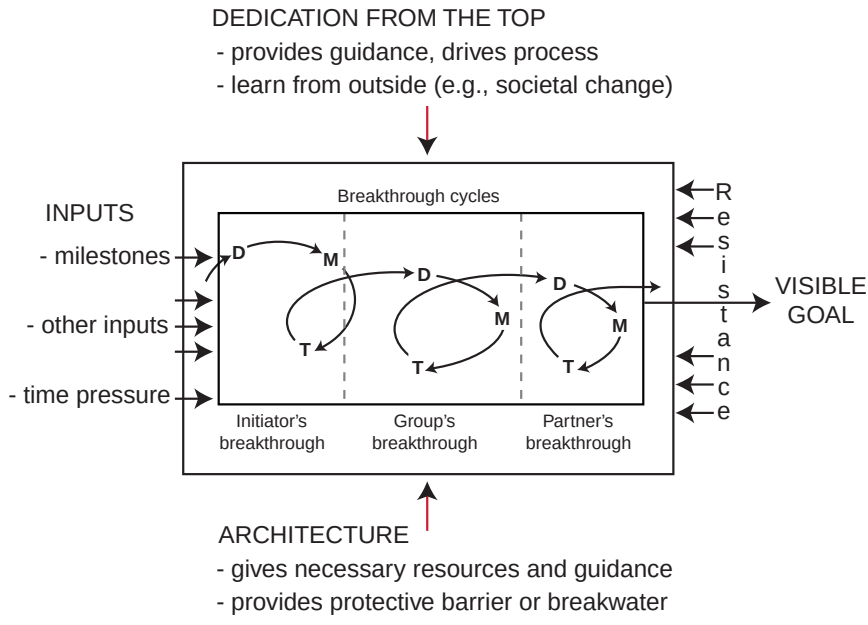


Figure 9-3. Breakthrough infrastructure.

infrastructure components shown in the figure: dedication from the top, a visible goal, an appropriate architecture, and numerous possible inputs.

Dedication from the top and visible goal

The infrastructure all flows from the top of the organization — from the CEO and perhaps a few other key people. Only from the top can come the overall philosophy and the visible goal. Also, while other people will be involved in providing the appropriate architecture, the insight about the appropriate architecture will come from the top. Finally, there may be some inputs that the top people can control or provide.

Only the person or people at the top of the organization are in a position to gather the necessary information from the world beyond the organization and to interpret it in ways that can lead to change and thus to breakthrough. Others in the organization may see relevant outside information, but unless it also is seen at the top of the organization, nothing serious will happen.

Returning once again to the Teradyne Aurora case study, CEO Alex d'Arbeloff sought help from an outside consultant in making his decision to go ahead with the Aurora project. Also, the entrepreneurial group's breakthrough came after d'Arbeloff suggested they visit non-Teradyne customers and an application software manufacturer. At the latter, the entrepreneurial group was exposed to the concept of writing software only in one's area of core competency and collecting the rest at low cost from software catalogs.

	Internal development	External development
Within current business boundary	Benchmark McDonald	Benchmark Cisco
Outside current business boundary	Benchmark Kodak	Benchmark Intel

Figure 9-4. United Parcel Service's model showing categories of circumstances requiring information and examples of benchmark companies. (Based on a presentation of Mike Esques at MIT on February 20, 2002.)

Figure 9-4 suggests one approach to the task of getting outside information in different circumstances. The figure suggests certain companies United Parcel Service might benchmark (seeking information from and about) to learn *how* to best manage internal and external development within and outside its current business boundary. From this model we see the following strategy for dealing with the different business situations:

Within–internal: Seek excellence within the daily job.

Within–external: If you have no time and no resources, then create a partnership (perhaps a merger or acquisition) to achieve your strategic objective.

Outside–internal: If there is a project that is not so far from your current business and that could become part of your current business, set up a strategic task force to try to develop it into a business within your business boundary.

Outside–external: There may be an opportunity, but you are not sure; in such cases utilize research universities such as MIT.

A chart such as that in Figure 9-4 provides a useful business diagnostic. Readers might consider their own business experience and fill in a chart such as that in Figure 9-5.

Reflect on your own experiences

	Activities INSIDE of company / organization	Activities OUTSIDE of company / organization
Topics WITHIN current business boundaries		
Topics OUTSIDE of current business boundaries		

Figure 9-5. Information source diagnostic.

Architecture

As shown at the bottom of Figure 9-3, an architecture is needed to support the breakthrough project and to protect it to from resistance in the existing organization (shown coming from the right side of the figure). A protective barrier (or breakwater) to fend off the various people and systems in the existing organization that are trying to kill the breakthrough project is critical. As shown in Figure 9-6, the breakthrough project typically must be at a corner of the existing organization. If the project is central to or spread across the existing organization, it will probably be impossible to provide it sufficient time, resources, and protection. Even at the corner of the organization, however, the resistance knows how to find it to try to kill it. Thus, there may be a temptation to spin-off the breakthrough group as a separate corporation, and in some cases this can work out well. However, a spin-off can fail for lack of resources or

from the burden of having to develop its own business activities. For instance, the existing organization may already have a strong process for recruiting talented new college graduates, and the spin-off organization may not have the skill to duplicate this.

The Teradyne Aurora case is a good example of how setting up a quasi-separate organization can help a breakthrough leader get around the innovator's dilemma. It also illustrates the need to overcome many roadblocks and much traditional thinking to make the necessary series of mental breakthroughs before a disruptive technology can be fully deployed.

At Teradyne Alex d'Arbeloff designed a protective architecture that gave the breakthrough project protection while supporting it by drawing on the existing organization's resources. The Aurora project had its own board of directors, but that board of directors included d'Arbeloff himself and two other members of Teradyne top management as well as Marc Levine and Hap Walker from the Aurora leadership group. Furthermore, the Aurora project was placed at a separate geographical location in the Boston area — away from Teradyne's headquarters and from the division whose products were most likely to be impacted by Aurora. However, Aurora was provided with both tangible and intangible resources from the parent company and other divisions.

The role Alex d'Arbeloff played in Teradyne Aurora could not have been performed by the actual team leader of the breakthrough group, whether in the corner of the existing organization or in a spin-off. As

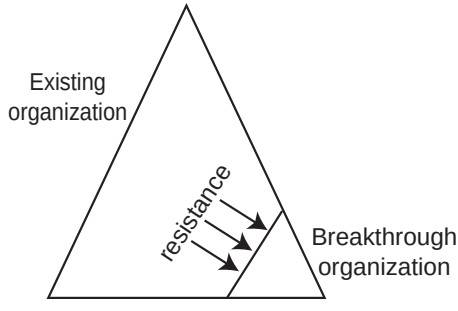


Figure 9-6. Locating the breakthrough organization.

CEO and chairman of Teradyne, d'Arbeloff made a practice of spending 20 percent of his time on something new. In 1990 his new activity work was the implementation of TQM in Teradyne.[2] In 1993 his new activity work was creating the Aurora project. As the sponsor and protector of the Aurora breakthrough group and as the CEO of the existing company, d'Arbeloff could bring big resources to bear for the benefit of Aurora at the price of having to work a little harder to protect it (e.g., locating it at a different site near Boston).

The Sharp company of Japan provides another example of an architecture that supported a breakthrough project in the face of potential resistance from the existing organization. The project leader was given a symbolic gold medal that signified his authority to recruit anyone from anywhere in the company for two years. Also, no limit was placed on his project budget.

Alex d'Arbeloff's role in Aurora illustrates an interesting concept in terms of architecture. In a traditional business where the leader is focused on incremental improvement and sustaining technology, the leader typically is at the center of the organization. A breakthrough leader is better placed at the edge of the organization, where he or she is able to bring things into and take things out of the organization.

If we look at infrastructure more generally (refer to Figure 9-3), our point about getting outside information and our Chapter 8 discussion of how Teradyne Aurora was at the corner of the existing organization and also connected to the outside world are consistent with evidence reported in an academic journal in 2004 (Burt04). The paper starts by saying:

> The hypothesis of this article is that people who stand near the holes in the social structure are at higher risk of having good ideas. The argument is that opinion and behavior are more homogeneous within than between groups, so people connected across groups are more familiar with alternative ways of thinking and behaving, which gives them more options to select from and synthesize. New ideas emerge from selection and synthesis across structural holes between groups. (Burt04, pp. 349-350)

A hint at these "structural holes" ideas was also found in an article in the popular press.[3] This article quoted Professor Wayne Baker of the University of Michigan business school as saying that "the structural holes approach reminds people to continually open up their networks, which naturally drift toward closure." According to the article, Professor Baker suggested that the best approach is a combination of good networking with those one is normally close to and exploitation of structural holes. Alex d'Arbeloff and the Aurora group used both tactics.

Inputs

There are many possible inputs to the infrastructure, as shown at the left side of Figure 9-3.

As with normal business activities, *milestones* are important to drive breakthrough activity along. Figure 9-7 shows examples of milestones

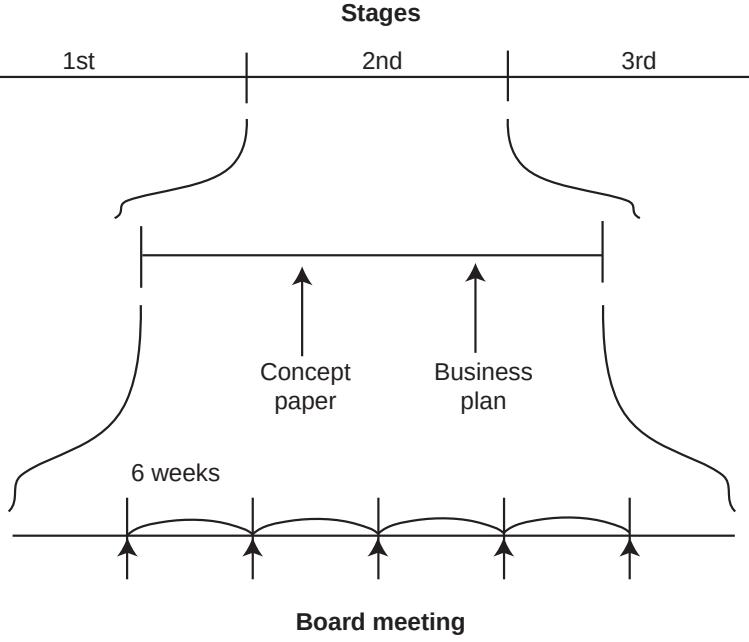


Figure 9-7. Examples of milestones in entrepreneurial group breakthrough activity.

for the second of the three stages of breakthrough — the entrepreneurial group breakthrough. As shown in the figure, if board meetings for the entrepreneurial group were held every six weeks, that timetable will permit, from the time of a board meeting, a week of preparation activity, four weeks to accomplish one task, and a week to prepare for the next board meeting. For instance, a concept paper (such as in the Teradyne Aurora case study) might be prepared in one task period, a business plan might be prepared in the next task period, and so forth.

Time pressure also is needed, although this cannot really be classified as an infrastructure element. Any business activity (but especially a breakthrough activity, which inevitably will be subject to much institutional resistance) is faced with lots of institutional, market, and technology constraints. A sense of real time pressure is necessary to keep people moving toward breakthrough.

Among other possible inputs is the influence of one or more real change leaders, which we discussed in section 5.1 — key people who help the CEO implement the change.

9.3 Market versus organizational breakthrough

As we suggested at the beginning of Part IV, business change tends to focus on either market breakthrough or organizational breakthrough. In Part II (Chapters 3–5), we described a path for making an organizational breakthrough (see Figure 5-9). This chapter and the previous chapter have explored breakthrough stages and cycles and components of the infrastructure for breakthrough into a new market (see Figure 8-4). It is interesting to compare how these two types of breakthroughs happen.

Market breakthrough tends to go from the intangible or invisible to the tangible or visible; for instance, the initiator has a vague idea, a group is pulled together to make the idea more operational, and finally a specific product is sold to the market. In contrast, organizational breakthrough tends to go from the tangible (more visible) to the intangible (less visible); for instance, the leader makes a decision to implement a new process improvement method, in time the people in the organization deduce what it means to apply the method in their domains, and eventually people

develop implicit skill in applying the method. Back in Chapter 6, we portrayed the visible and invisible as above and below water in Figure 6-1. If we now think in terms of the tip of an iceberg (Figure 9-8), we have a hint as to why breakthrough of either type is so hard: So much of each process is below the surface.[4] In addition, whether market or organiza-

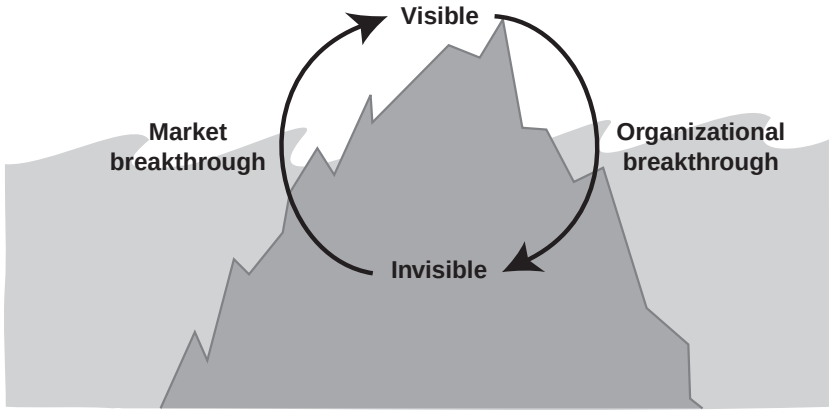


Figure 9-8. Visible (tangible) and invisible (intangible) factors in two types of breakthrough: The iceberg analogy.

tional breakthrough is sought, seeking a lot of one tends to result in at least some of the other — and most of both are underwater.

Both organizational and market breakthrough (together we could call them business breakthrough) involve three elements: (1) a process of creative insight, (2) a time sequence, and (3) an incubation infrastructure.

1. The process of creating insight in both cases is that shown in box 2 in Figure 8-8 (p. 203); the process involves unlearning, chaos, and a new mental model.
2. The time sequence of the two kinds of breakthrough is shown in Figure 9-9, although naturally things don't line up in time as neatly as suggested in the figure.
3. The incubation infrastructures of the two kinds of breakthrough are shown in Figure 9-10. Look for the parallels between the two.

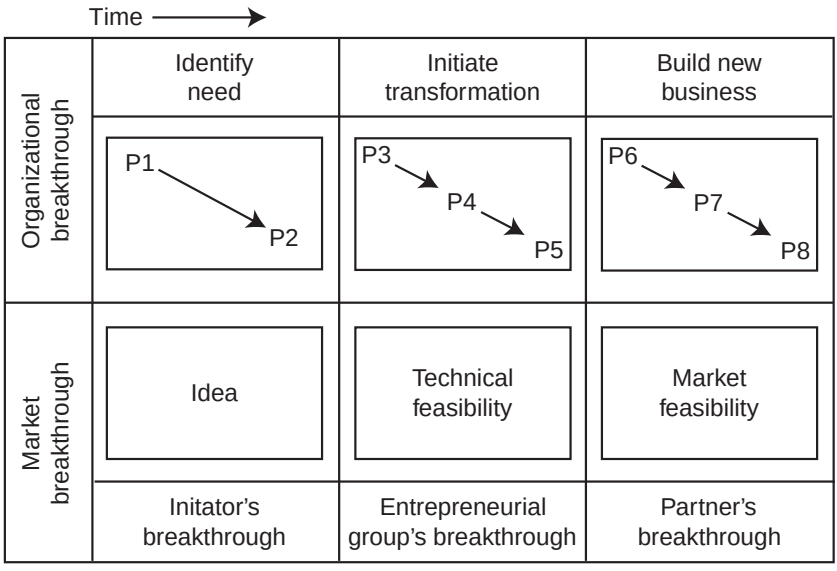


Figure 9-9. Time sequences of two types of breakthrough. (P1–P8 indicate the eight principles from the three tasks of visionary leadership described in Part II, Chapters 3–5.)

9.4 New start-up, replacement, or add-on

Experienced managers know a great deal about the methods of managing an existing business. We ourselves wrote most of a large book on the subject (Shiba01). The theory and methods of breakthrough into a new business area are less well developed, although progress is being made in understanding them (e.g., the work leading to this book). The important point is that, as we suggested earlier in our discussion of "the innovator's dilemma," the paradigms for the two different kinds of activity are quite different.

We list some differences in Table 9-1 to illustrate how different from a manager's typical experience is pursuit of breakthrough. It is unusual to find a business leader who is inclined to and skilled at breakthrough management. It is even more unlikely that many managers in a business will be inclined to and skilled at breakthrough management, and few regular employees of a business will welcome efforts at breakthrough.

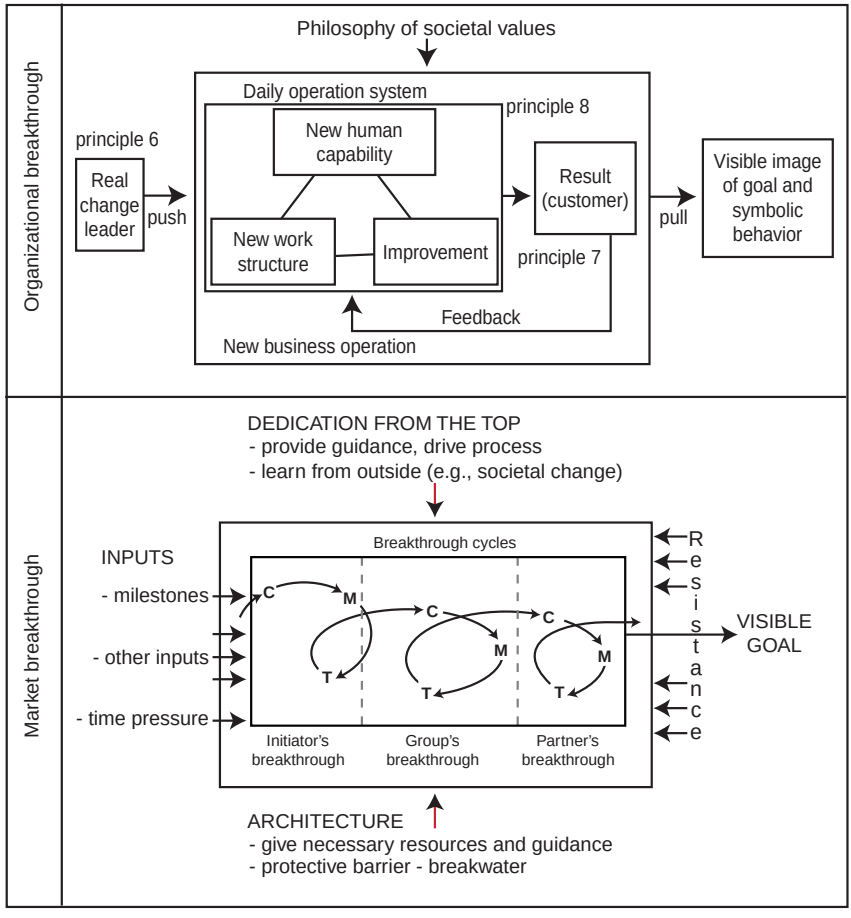


Figure 9-10. Infrastructures for two kinds of breakthrough. The "Organizational breakthrough" box recapitulates Figure 5-8 from the summary discussion at the end of Chapter 5. The "Market breakthrough" box is the diagram from Figure 9-3, which captures both stages/cycles (Chapter 8) and infrastructure for breakthrough (Chapter 9).

Table 9-1. Two different business paradigms.

Existing business	Business breakthrough
Customer satisfaction	New value
Learning for improvement	Unlearning
Planning before action: Planning for implementation	Planning after action: Planning for learning
Orientation to reducing and eliminating defects	Opportunity orientation
Rational and logical approach	Emotional and intuitive approach
Total participation and organization around teamwork	Individual contribution and collective genius of experts
Information from within the boundaries of the current business area	Information from outside the boundaries of the current business area

It is safe to say that any effort to have the same people in a business simultaneously deal with traditional operating activities and undertake a business transformation is likely doomed to failure.

Thus, when a leader sees the need for change, there are several ways he or she can go about it.

- A new organization can be started. This is essentially what happened with SOL, Zin, and ASKUL. Liisa Joronen started a virtually new business from the losing business her father handed down to her. Brother Wim started a separate activity, the ZIN Center, which was very different from his traditional monastic order and entailed only modest involvement of the order but still provided arrangements to support the aging and retired brothers. With ASKUL, the parent company simply started an enterprise that was in effect — and today is in fact — a separate company.
- The existing organization can be more or less completely transformed. This is what happened with Humanitas, FAVI, NIMS, and the Seiko Sports and Leisure Products Division. Over time, the previous work structures, behavioral norms, and perhaps physical facility were replaced.

- The existing organization can be augmented. This is what happened with Maeda and Teradyne Aurora.

The last approach — augmentation of the existing organization — is perhaps the most commonly needed and the most difficult to follow.

We have mentioned throughout this book the possible mismatches between traditional business improvement methods and the methods needed for breakthrough, and these mismatches compound the challenge of finding and using new methods more applicable to breakthrough. In section 2.3, for example, we discussed three types of management: management for control, management for incremental improvement, and management for breakthrough. We noted that few businesses today can function with only management for control of the current way of doing things: There are too many changes happening all the time — changing products, changing customer desires, changing distribution channels, changing regulations, and so on. Most businesses must at least control existing processes and pursue incremental improvement to deal with evolutionary change.

The reality, however, is that many companies that must have breakthroughs for long-term survival must also continue to run their traditional businesses for short-term survival. Companies may have businesses in three stages of development: a business or businesses operating well in a traditional manner, a business or businesses that are past their prime and must be phased out sooner or later, and a business or businesses that are breaking through into new areas to replace the businesses in the other two stages of development as appropriate and necessary.

So although this book has focused on the need of many businesses to manage breakthrough, and although some businesses (such as new start-ups) can deal with only breakthrough management for a while, many businesses must deal more or less simultaneously with evolutionary change and breakthrough. And this can be a problem. As Clayton Christensen (Christensen97) explained, the existing organization with its successful products and services can be an obstacle to breakthrough change — the existing organization is focused on optimizing evolutionary change.

Professor Michael Tushman of Harvard Business School and Pro-

fessor Charles O'Reilly at the Stanford University Graduate School of Business (Tushman02) also discuss the potential conflict between evolutionary and breakthrough change and management. Tushman and O'Reilly acknowledge the fact that many companies are not good at doing both things simultaneously; nonetheless, they emphasize the need for companies to run and optimize their existing businesses even as they seek breakthrough. They argue that companies must develop leadership and mechanisms to deal successfully with the conflicts between the existing organization and the breakthrough efforts.

O'Reilly and Tushman describe an organization able to simultaneously *exploit* an existing business and *explore* breakthrough into a new business as an "ambidextrous organization." In the authors' words, "Ambidextrous organizations establish project teams that are structurally independent units, each having its own processes, structure, and culture, but are integrated into the existing management hierarchy" (O'Reilly04, pp. 74–81). This is the sort of situation we described in the Teradyne Aurora case (see section 8.1 and pp. 218–220).

O'Reilly and Tushman present a chart that has the same purpose as our Table 9-1: It shows the conflicts between the methods of evolutionary management and the methods of breakthrough management. They also make the point that in their research companies based on functional organizational structures succeeded in only 25 percent of their attempts at breakthrough innovation, and companies based on unsupported teams or cross-functional teams never succeeded — whereas companies with "ambidextrous" capabilities had a success rate of more than 90 percent.

Tushman and O'Reilly (Tushman97, pp. 19) list three reasons from Richard Foster (Foster86, p. 134) for why companies typically fail to deal effectively with a technology change (such as the change from vacuum tubes to transistors):

1. Companies may decide "not to invest in the new technology."
2. They may decide "to invest but pick the wrong new technology."
3. They may fail "because of their inability to play two games at once: To be both effective defenders of what quickly became old technologies and effective attackers with new technologies."

Regarding Foster's third point, Tushman and O'Reilly note that bitter disputes raged within vacuum tube producer RCA about how best to deal with the advent of the transistor. They note that whereas Seiko was able to manage a smooth transition from being a mechanical watch company to being a quartz and mechanical watch company, the Swiss watch industry — which had invented both mechanical and quartz movements — chose to reinvest on the mechanical side and suffered drastically.[5]

From the written works and presentations of Professors Tushman and O'Reilly,[6] we have derived our own model of the elements that are necessary to be in an ambidextrous organization. Shoji Shiba calls this model the Seven Infrastructures for Ambidextrous Organizations, as shown in Figure 9-11. In discussing the figure, we use Tushman and

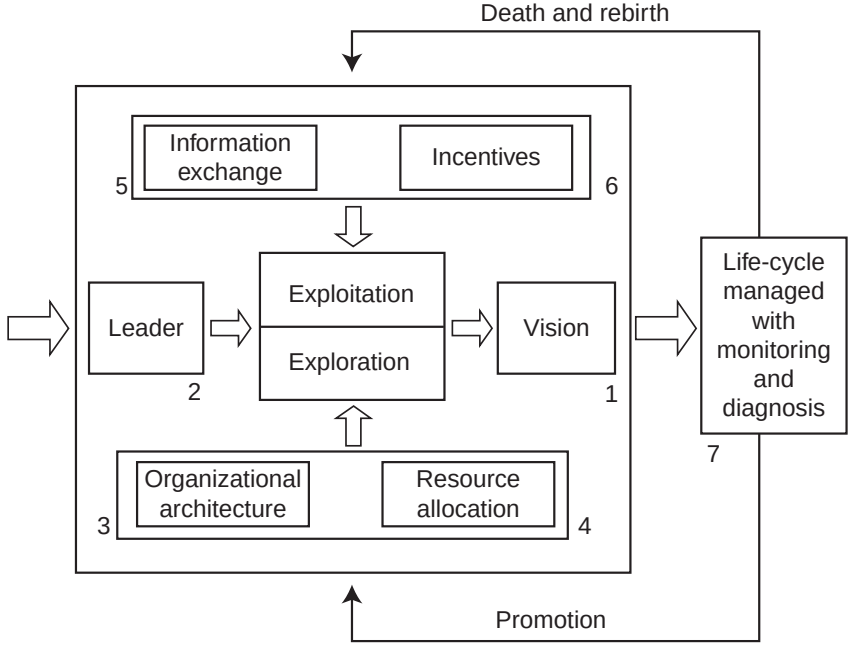


Figure 9-11. Seven infrastructures for ambidextrous organizations.

O'Reilly's shorthand of *exploitation* (of an existing business) and *exploration* (of a new business). Note the parallels between this figure and our Figure 2-14 (p. 40), although now we are dealing with both exploitation and exploration rather than exploration alone.

The model shows elements of push and pull: (1) A leader or leaders must be selected who have *(a)* great ability to influence others in the organization, *(b)* great ability to envision the future, and *(c)* the ability to exploit on the one hand and the ability to explore on the other hand. The exploiter will be performance oriented. The explorer will be opportunity oriented. (2) The leader(s) will create and share a clear vision of the future and of how the exploitation and exploration activities will coordinate in the areas of the organization they use in common.

At the bottom of the Figure 9-11 model is a protection element: (3) An organizational architecture will be created with a barrier or barriers to protect the exploration activity, as shown in Figure 9-12. Such barri-

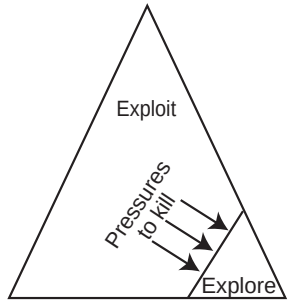


Figure 9-12. Organizational architecture to protect exploration activities from existing exploitation operations.

ers may include elements such as a separate location, a separate chain of command, and a separate board of directors. (4) Resources will be allocated to the exploration effort. These may be tangible resources, such as people, money, and space, and/or they may be intangible resources, such as the time and emphasis allocated to the exploration effort by top management. It is important that the resources not be limited by the demands of the overall financial trends and averages of the company.

As shown at the top of the Figure 9-11 model, the organization needs to allow competition and at the same time minimize conflict between exploitation and exploration. (5) Information needs to be exchanged between the exploitation and exploration efforts. Naturally, the exploration people may draw on technologies and experience gained while they were still part of the exploitation effort. Additionally, there may be some cases

in which existing processes may be leveraged by the exploration effort. In return, the exploration people should share with the exploitation people any new understandings that come from the exploration effort — new insights about technology, markets, current customer attitudes, and so forth. (6) Incentive systems and measures need to be set up so they minimize conflict between the exploitation and exploration efforts. For instance, in the exploitation effort, incentives may include promotions and bonuses, and metrics naturally will be operational. In the exploration effort, the incentives may be more focused on stock options (with perhaps modest current compensation), and measures may include patents and new accounts obtained.

The right side of the Figure 9-11 model represents the organization's ability to understand the life cycles of its business(es). (7) The company needs to monitor and diagnose the current situation for its business and to take appropriate action. The business being assessed may be an existing one in the growth phase, and discipline may be needed to do appropriate incremental improvements; or the growth phase may be ending, as indicated by control numbers that are beginning to slip, and courage may be needed to get out of the business. The assessment may reveal a need for a new business; in that case the required discipline will involve the best methods to achieve breakthrough. Or a new business may have developed to the point that it is time for the company to move from exploration to typical operational performance, and it will take courage to make the necessary staff changes.

Clearly, the CEO plays a crucial role in creating and activating an ambidextrous organization. Table 9-2 shows criteria for auditing the behavior of senior management in the context of the effort to build an ambidextrous organization.

Table 9-2. Five audit criteria to assess an organization's potential to be ambidextrous

1. Are senior managers protecting exploration, or is there a counterculture opposing exploration success?
2. Are senior managers allocating time for innovation (exploration)?
3. Do senior managers exhibit diversity in thought and behavior (exploration/exploitation)?
4. Do senior managers lead/reinforce a culture/acceptance of experimentation and/or failures?
5. Do senior managers nurture "eccentric and passionate" individuals in the organization?

Chapter 10

Communities and Societal Values

We see breakthrough management as requiring the use of several sets of innovative (or at least nontraditional) business practices. In particular, we see increasing need for (1) shared learning and (2) integration with a variety of extrabusiness societal concerns; these will be the subjects of the two sections of this chapter.

10.1 Community building

Business improvement typically involves a process of mostly explicit networking across levels of organizations and society; such networking helps both to hasten development of improvement methods and to diffuse them. All business performance ultimately rests on individual performance (or on automated organizational processes, which themselves have to be built with individual skill). As shown in Figure 10-1, organizational skill (systems, procedures, training, teamwork, etc.) fosters the development and practice of individual skill. In turn, intrasocietal communication and interchange (among companies, their suppliers, and their customers; within industries; through national and regional trade and business improvement consortia; etc.) help improve organizational skill. Finally, intercountry, cross-national, and other international activities help improve skill within a particular society.

As shown in Figure 10-2, our exploration of breakthrough has been organized in terms of three of the four skill levels in Figure 10-1, although we have shown individual skill and organizational skill as interlinked rather than depicting individual skill as embedded within the circle of organizational skill. The previous chapters of this book have dealt with

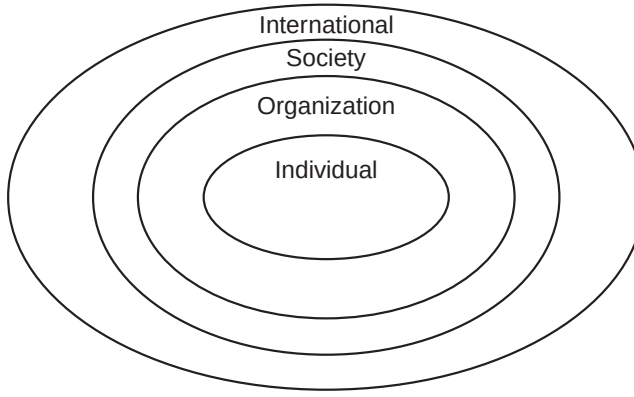


Figure 10-1. Cascading contexts of skill.

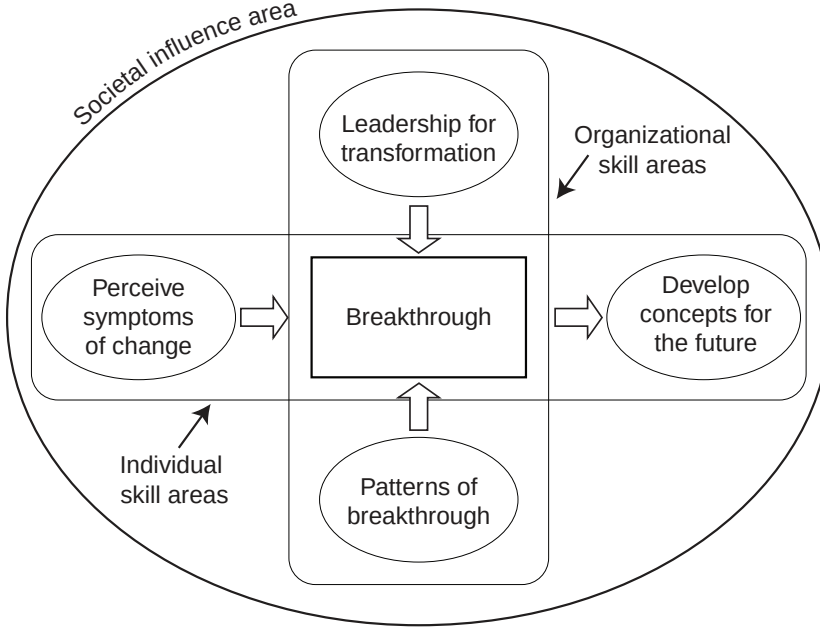


Figure 10-2. The relationship of elements of breakthrough to individual, organizational, and societal realms of skill.

the organizational and individual levels. This chapter focuses on the societal level of Figures 10-1 and 10-2.

Mutual learning activities in India

Companies in India are explicitly using community-based techniques for mutual learning. In Chapter 1 we described India's rapid advance in improving quality and stated that an important component of this rapid advance was India's embrace of the methods of mutual learning. Many Indian industries are using a concept they call "clusters." According to the Confederation of Indian Industry (CII), "A cluster is a group of companies that work and learn together for the purpose of improving their performance through mutual sharing and learning." As of the end of 2005, 46 clusters with a total membership of more than 500 companies representing different sectors of industry were participating in the "cluster movement." For example, in Mohali and Gurgaon there were mixed industry clusters, in Indore and Bhopal there was a light engineering cluster, and in Dibrugarh there was a tea gardens cluster. Within a cluster it is typical for cluster members to visit one member's facilities one month and another member's the next month. An effort is made not to have direct competitors within the same cluster, although the tea-gardens cluster appears to be an exception.

In addition to the cluster activities in India for improvement of traditional business practices described in the previous section, Shoji Shiba is involved in new mutual learning activities with strong coordination from CII for the purpose of diffusing breakthrough concepts, tools, and practices (Shiba05a, Shiba05b). The first community started in July 2004 and the second in November 2005. To date nine organizations are seriously participating.

Less formal methods in the United States

In the United States we have some explicit infrastructures that operate at the societal level, but the impact has been somewhat uneven. Examples include the American Society for Quality (`www.asq.org`) for quality practitioners, regional groups of businesses such as the Center for Quality

of Management (www.cqm.org), and the Baldrige Award structure (www.quality.nist.gov/). We covered such activities to some extent in our 2001 book *Four Practical Revolutions in Management*.[1]

American societal infrastructures for continuous improvement have never had the impact of such infrastructures in Japan. After World War II, Japan developed very effective societal infrastructures. Two examples are the Deming Prize and the nationwide network of quality-control circles, which were known as Japan's "two wheels" of quality (see Figure 10-3). The Deming Prize was a challenge to entire organizations

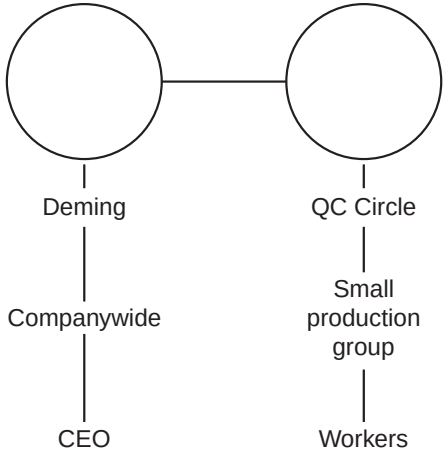


Figure 10-3. Two wheels of quality in Japan.

and their CEOs to improve quality. The network of QC circles enabled small groups and individual workers to improve quality. These no longer have quite as much impact as they once did in Japan, because many top managers of companies have shifted their focus from operations to strategic direction. Today there is a feeling that operations are already good enough and that in a globalized world strategy is more important. In the past, quality was the paramount concern.

Japan historically has been stronger than the United States with regard to explicit societal infrastructures for incremental improvement; the United States, however, may be stronger than Japan with regard to implicit societal infrastructures for breakthrough.

In 2001 Stephen Levy spoke to Shoji Shiba's MIT class on tools and processes for breakthrough. Levy was for many years the CEO of the well-known high-tech company Bolt Beranek and Newman Inc. (BBN), was also involved in a several national and regional trade organizations, and has had decades of involvement with the financial and investment communities. Since retirement from BBN, he has been the principal in a Boston-based venture partnership. In his presentation to the MIT class, Levy described his view of an implicit societal infrastructure that supports new venture creation in the United States. He listed 10 elements in this infrastructure and described each in some detail. We show these elements in Table 10-1. The contents of the table look orderly, with lots

Table 10-1. Ten U.S. societal infrastructure elements that support new business ventures

1. Availability of seed capital from professional venture capital firms or angel investors.
2. Highly developed network of venture capital firms that invest substantial sums over a period of time based on progress.
3. A highly developed IPO market that can point to financial gains from earlier IPOs.
4. An environment in which large companies can acquire entrepreneurial companies and benefit from them.
5. A tax system that gives benefits to long-term capital gains and stock options.
6. A willingness on the part of successful and experienced businesspeople to mentor younger entrepreneurs.
7. Professional services such as real estate firms, law firms, etc., that are willing to work for start-ups and with special fee structures.
8. A system that provides some liability protection for individuals who serve as officers or on boards of young companies.
9. Positive acceptance of experienced people who have had several jobs, if those jobs indicate a record entrepreneurial performance.
10. A willingness on the part of businesses and customers to buy new products and services without regard to the short operating history of the provider.

of apparent cause and effect; but in fact the United States has no such systematic process to foster new ventures; rather, this infrastructure is ad hoc and implicit.

There is another way in which the U.S. approach to business is more informal than Japan's. In Japan great respect traditionally has been paid

to a company with a long reputation for excellent performance, whereas in the United States what a company is doing now matters more than its long reputation. In the United States a young entrepreneur with no prior business experience but with a good idea can get venture funding. A young company that has a new but working product can find customers. This American characteristic has also benefited Japanese companies. Kazuo Inamori, founder of Kyosera, made his first sales to IBM, which bought from him in spite of his relative inexperience.[2] Masatoshi Suzuki of Ito-Yokado Co. Ltd. (7-Eleven in Japan) was able to get low interest loans from the U.S. capital markets based on his company's excellent quality of service; he could not have easily gotten such funding in Japan because of the company's short history.[3]

In any society, there are three types of people: (1) people who are inclined to take risks with new ventures, (2) conservative people who don't like to take risks, and (3) people in between types 1 and 2. In Japan, traditionally and even now, the type 1 group is relatively small, although among the young there are an increasing number of risk-accepting people.

New communities for future creativity

Mutual learning infrastructures, whether implicit or explicit, have tended to be based on past best practices and experience-based estimates of the future and have been quite effective for incremental improvement. However, such systems may be insufficient for creating the "future knowledge" needed for breakthrough — the kind of insight and understanding that can enable leaders to anticipate and plan for breakthrough changes.

There is a need for new systematic societal infrastructures for future knowledge. At several points in this book, we have suggested that one important source of future knowledge is outside information. This was the case with the FAVI (section 4.1), SOL (section 4.2), and Teradyne (section 8.1) studies. United Parcel Service (UPS) also seeks outside knowledge via a strong connection to MIT (in addition to its approach described in Chapter 9 and sketched in Figure 9-4). Such a connection to a university or other research organization can be an excellent source of outside knowledge for the company involved.

While UPS is far from alone among U.S. companies that work closely with university researchers some U.S. business executives look askance at university researchers. These executives may view university researchers as interested only in their own research area or as otherwise too "ivory tower" and insufficiently dedicated to the interests of the company that hires the university researcher as a consultant. In Japan active collaboration between industry and academia has not happened historically and is just beginning to bloom.

Some U.S. universities have special programs for sharing research results with industry. Again, however, some U.S. executives view these programs as being aimed more at improving university income than at helping industry. New approaches are needed to try to close the gap between universities and businesses, and we are beginning to see first steps in the form of societal communities. Two examples come from the extended MIT community.

In the late 1980s, people at MIT became concerned about the declining fortunes of U.S. industry in the face of international competition, especially from Japan. As a result, MIT faculty members and others undertook a significant research project on how the United States might improve productivity. The MIT Commission on Industrial Productivity was formed in 1987, did an extensive study, and presented MIT with a set of recommendations for follow-up. In 1989 the results of the commission's study were published in the book *Made in America* (Dertouzos89). As the book said, "*Made in America* identifies what is best and worth replicating in American industrial practice and sets out five national priorities for regaining the productive edge." This book got much attention in the United States and was translated into several languages for distribution in countries around the world, including Japan, where it was widely read.

Closely connected with the Made in America activity was another MIT step aimed at the effort to address the competitive situation of U.S. industry. In 1988 MIT started a program known as Leaders for Manufacturing (LFM). Eleven of the most well-known U.S. manufacturing companies initially joined with MIT to sponsor the LFM program, and today there are 23 partner companies.

According to Professor Steve Graves,

> [T]he creation of LFM can be viewed as having emanated from [the Made in America study]. It was certainly a next step. Three of the four key principals for LFM were part of the commission that wrote the book — Kent Bowen, Gerry Wilson (dean of engineering) and Lester Thurow, soon-to-be dean of management."[4]

MIT's LFM graduate program is oriented to engineering graduates with a few years' experience in industry or in the military. Each June an LFM class starts and participates in the program essentially full time until graduating in May two years later. The first summer the 50 or so LFM class members take the same five courses to get them on a common footing, as many have never taken management or business courses before. During the first school year, the LFM students take classes at both the MIT business school and in an engineering department. The second summer and first term of the second school year, LFM students do an internship in industry, primarily with LFM partner companies; and the second term of the second school year they attend more business school and engineering department classes and write a thesis. They graduate with a Master of Science degree in their engineering specialty as well as an MBA. The LFM training is designed to develop future leaders of industry (hence the program name) and future CEOs.

Participants want different things out of the program. Many are trying to take a step from being individual contributors in an engineering area to becoming manufacturing managers. Others already work in manufacturing but also want to move into management. Participants coming out of the military are sometimes using the program as a step to civilian life and a transition from the military to industry. With only about 50 positions in each class, admission to the program is highly competitive. Nominally, all participants are interested in a future in manufacturing, and most graduates of the program initially do go to manufacturing companies.

LFM is highly regarded and has been copied at least at Stanford. With many hundreds of graduates since its founding, LFM has had significant impact in the industrial recovery of a variety of U.S. companies. For example, LFM students and graduates have contributed to Boeing's 737

moving line production, General Motors' lean production, and Dell's supply chain revolution. Intel is the number one recruiter of LFM graduates.

The LFM program has always involved partner companies and thus has always worked on closing the gap between university and industry. Partner companies influence the direction of the LFM curriculum and are directly helped through their participation in the program. LFM graduate Earl Jones suggested to us some of the ways LFM partner companies benefit:[5]

- Companies are in a special position for recruiting LFM graduates.
- Companies have access to professors and research.
- More generally, a certain vitality of ideas comes from staying close to academia.
- In many cases companies receive considerable return from the internship work itself.
- The partner companies that benefit most look at LFM as a strategic human leadership pipeline, and the LFM networks within partner companies can be transformational.

As the LFM program has continued, it has evolved into a lifelong learning community for its alumni. The connection with LFM and with other LFM participants is not over when a participant graduates from the program. The alumni part of the LFM website[6] says the following:

> After commencement, LFM graduates become part of an extended community of LFM alumni that offers networking opportunities and events that span a lifetime and the globe. LFM alumni provide information and support for each other throughout their careers.

Not only is there an LFM alumni website for networking; some companies with lots of LFM alumni have internal LFM networks. Twice a month a seminar by a faculty member, an alumnus of the LFM program, or an LFM sponsor company is broadcast over the Web. An LFM alumni council helps shape the direction of the LFM program and community, encouraging relevance in a changing world. An annual LFM alumni conference offers two days of speakers, workshops, and networking. And there are regional and informal get-togethers and networking opportunities as well.

Once upon a time, individual learning might have been sufficient for dealing with routine business activities. But today, a (virtual) community may be needed to generate the necessary future knowledge for success. Even very smart and very highly trained individuals may find they need outside help. In the case of the LFM lifelong learning community, everyone is smart and highly trained — it may be said to be a community or partnership of the elite. Such elite communities may be essential to share and create future knowledge.

Figure 10-4 is one way to look at MIT LFM's "community for future knowledge."

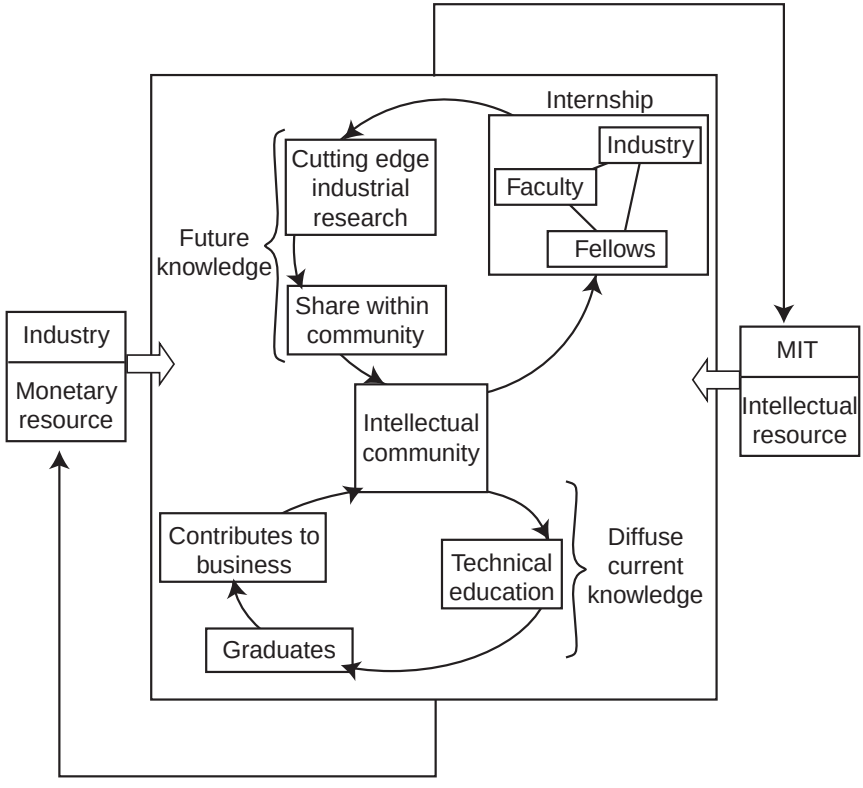


Figure 10-4. MIT-LFM community.

MIT is well known as source of entrepreneurial ideas. A 1997 Bank of Boston study concluded that between 1947 and 1997 startups with some connection to MIT numbered about 4,000 and that approximately 150 new companies were being started each year.[7] Historically, however, the connection of the start-up companies to MIT was usually ad hoc. Sometimes start-up founders were faculty members who continued to teach part-time at MIT (e.g., the founder of Bose); sometimes start-up founders left the MIT faculty to start their companies (e.g., Bolt and Beranek); sometimes faculty members sat on start-up boards (e.g., David Staelin at EMPower Corp.); sometimes MIT graduates or students founded companies (e.g., Bob Metcalfe and 3Com); sometimes faculty members consulted to start-ups; and no doubt there have been other sorts of connections between MIT and start-ups including licensing agreements.

However, in January 2000 MIT launched the Venture Mentoring Service (VMS) as an explicit way to help start-up companies. The MIT website for VMS[8] described the idea:

> The MIT Venture Mentoring Service (VMS) traces its beginnings to a meeting suggested by MIT Provost Robert Brown in 1997 between Alec Dingee, an MIT Sloan School of Management alumnus, and MIT Professor David H. Staelin,[9] at which they found they shared a common vision—to further MIT's educational mission by providing entrepreneurs within the MIT community with mentoring, advice, and help in developing their enterprises. Each had deep MIT roots (Dave received his bachelor's, master's, and doctoral degrees from the Institute and has been on the faculty since 1965, while Alec has remained closely connected with MIT for several decades following graduation). Each also had extensive experience in starting companies and managing them to success.
>
> From these backgrounds their vision was developed, built around a shared belief that a fledgling business is far more likely to succeed when an idea, a good business plan, and an entrepreneur are matched with proven experience. With the blessing of the Provost's Office, they set about developing a structure that could translate their vision into reality.
>
> VMS activities revolve also around the belief that active support

> of entrepreneurial activities improves the education of MIT students and alumni, strengthens MIT's role as a world leader in innovation, and broadens MIT's base of potential financial support. VMS delivers its services through volunteer mentors who are selected for their experience and their enthusiasm for the program. . . .
>
> VMS's mentors are skilled volunteers — drawn from the corporate, entrepreneurial, and academic communities. They include MIT alumni and faculty, and their careers represent a wide range of skills and experience as founders, chairmen, CEOs, chief technical officers, chief financial officers, or directors of successful corporations and partnerships.

Ray Stata (chairman and founder of Analog Devices) explains why CEOs and other top managers are interested in participating in VMS:[10]

> Many successful entrepreneurs are philanthropic, but would also like to share the understanding gained in the process of creating and leading new enterprises.
>
> The Venture Mentoring Service offers an ideal vehicle for putting those hard-earned lessons to work in support of a new generation of MIT entrepreneurs.

Sherwin Greenblatt is an immediate example of the urge to share hard-won understanding with the businesspeople of the future. Greenblatt, an MIT graduate, was the first employee of Bose Corporation. Over the years at Bose, Greenblatt held the positions of chief engineer; director of engineering; executive vice president; and, for 15 years, president, before he retired. After retirement Greenblatt served as the director of VMS.

VMS is unique in several ways:

- VMS is a new sort of human resources development activity. Its goal is to educate its mentees for the greater good of society. Unlike a venture capital organization, VMS is not focused on the success of a specific company. VMS volunteers do not express disinterest if a proposed business idea is not excellent. They will try instead to help the mentee figure out a better idea.
- VMS is based on a spirit of volunteerism. The mentors are not paid. By the summer of 2003, there were 50 people and companies and 40 mentors (all with no pay) participating in VMS.

- The quality of the mentors is extraordinary. Indeed, the quality and experience of the mentors — successful CEOs, functional experts, and people who have participanted in multiple start-ups — is such that it would be impossible to put a reasonable price on an hour of their time.

What insights do we get from studying MIT's LFM and VMS activities, the motivations behind these activities, and the structures of the programs? The overriding idea, we believe, is that a knowledge-based community is a high potential source of breakthrough — a higher source of breakthrough innovation than more traditional networking, as suggested in Figure 10-5.

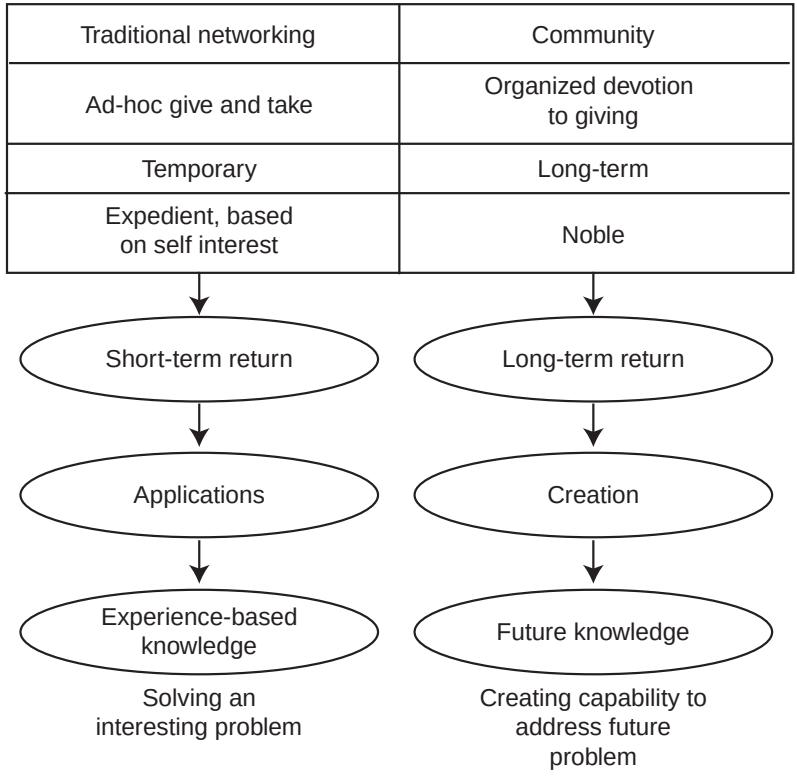


Figure 10-5. Comparing and contrasting traditional networking with MIT LFM and VMS activities.

We see an interesting cycle in play. University people (faculty, graduate students, etc.) get involved in start-ups, become company leaders, get lots of valuable and diverse experience, and make lots of money. Activities like MIT's VMS provide a place where some of these people, who feel a connection back to the university, can play a visible and rewarding role. With such experienced people from business available, highly productive partnerships between the university and the VMS mentors can be formed. These partnerships offer great potential for helping leaders of new ventures, and we look forward to resulting developments in many companies.

10.2 Common elements of business

In Chapter 2 (see pages 31–39 and Figures 2-11, 2-12, and 2-13) we discussed three types of management explicitly: control, incremental improvement, and breakthrough. In Chapter 9 we talked more implicitly about the three types of management and noted that many if not most businesses must simultaneously manage their existing business while they break through into a new business area.

As shown in Figure 10-6A, in order for a business area of a company to remain competitive in its growth phase (the middle part of the famous S-curve of the business/product life cycle) a business must do incremental improvement to bring out new products and gain efficiency. As the market for the product line matures, the available incremental improvements tend to be smaller. At some point, the market saturates and growth completely levels off and then begins to fall. At this point the business must seek breakthrough into a new area.

Assuming the breakthrough begins to succeed, control of the new business processes becomes very important, as shown in the middle of Figure 10-6B.

It is important to quickly break into a new market, but then a business must focus on stability and reliability, or else it will lose the customers interested in its new product or will be unable to make money selling the product. For instance, Intel's "copy exactly" rule was a quick path to control as an innovation from one part of the company was spread to other parts of the company.

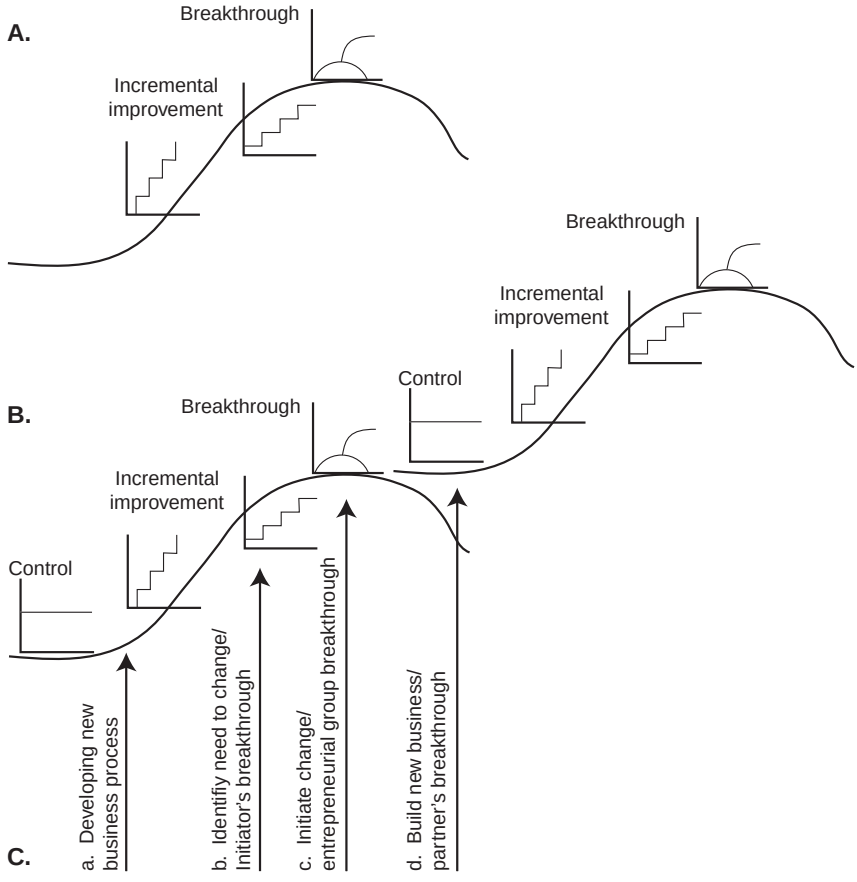


Figure 10-6. Different types of management across business life cycles.

In time, this progression of focus on the different types of management at different places on the S-curve of a business's life cycle may repeat itself, as shown at the right side of Figure 10-6B. Figure 10-6C shows how the various regions of the S-curve connect to the organizational transformation tasks we described in Chapters 3–5 (identification of need to change, initiation of change, and building new business) and the stages we described in Chapters 8–9 (initiator's breakthrough, entrepreneurial group breakthrough, and partner's breakthrough).

As we have suggested repeatedly, it is difficult from an organization to transform itself or its business: People mostly don't want to change from that with which they are familiar. Some of the barriers to the changes

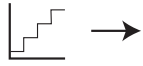
	Required business transition	Human barrier	Information barrier	Needed to make the transition
a. Developing new business process		Theory X	Focus on process	Human trust
b. Reaching identification stage	 Identifi-cation	Arrogance	Focus on current business	New societal values
c. Reaching initiation stage	Identifi-cation 	Fear of risk	Focus on improving what's already working	Focus on cost of not trans-forming
d. Reaching new business process		Intuition-based action	Focus on nonobjective information	Fact based action

Figure 10-7. Barriers to proceeding to the next stage (the items in the left column come from part C of Figure 10-6).

companies need to progress along the S-curve through the different types of management are shown in Figure 10-7.

Let's look more closely at steps a–d in the figure:

a. The step from control to incremental improvement is inhibited by lots of standards and procedures (Theory X management and low-variation processes) and by shortsightedness about trusting the people who are trying to improve the standards and procedures (by promoting Theory Y management). (For Theories X, Y, and Z, see Figure 2-12 and the discussion on pages 38 and 206)

b. The step from incremental improvement to identifying the need for transformation is inhibited by the arrogant idea that what is already being made and sold is what customers will always want. Even when a 10× change occurs, it is difficult to identify it and to change. To break this barrier involves relooking at the fundamental objectives of the business and seeking new societal values beyond

current business interests (Theory Z).

c. The step from understanding the need for transformation to initiating the needed changes is inhibited by fear of the unknown and by great pressure from within the organization to apply all resources to the existing business areas (the innovator's dilemma). To make progress people must think about the future cost of not transforming (i.e., of ignoring what is not working and possibly going out of business) rather than focusing on the current cost of transforming. Transformation may divert resources from improving what is already working in the existing business, but what is already working may already be well into the stage of diminishing returns.
d. The step from initial development of the new business to applying the techniques of process control is inhibited by the fact that the start-up people are in the habit of (or naturally inclined to) acting intuitively and are not used to basing actions on facts. To make this step it helps to reflect that neither completely intuitive action nor completely fact-based action provides a useful mix of creativity and efficiency; the optimal operating point is somewhere in between. The business must attain a balance in which creativity is informed by a heavy dose of facts and the methods resulting from creative insights are made repeatable (and thus productive) by being embedded in explicit processes.

Today, things are getting more complicated for business leaders. No longer is it sufficient for a business leader to learn to deal with the three types of management. Look at Figure 10-8. Historically all businesses have had to be concerned with the four areas of concern shown in column A, which traditionally have reduced to the elements listed in column B. Today, increasingly, people in some countries and cultures are suggesting or demanding a different interpretation of the elements listed in column A — as we indicate in column C. In Japan, young people increasingly favor businesses focusing on the elements of column C rather than on the elements of column B. According to the renowned social commentator Jeremy Rifkin (Rifkin04), Europe is also strongly leaning in the same direction.

The task of investigating and codifying methods of management in

A	B	C
Business space or field	Market	Community
Behavior	Competition (win or lose)	Cooperation (win-win)
Time	Growth	Sustainability
Result	Profit (or other tangible result)	Human happiness (intangible result)

Figure 10-8. New common elements of business.

the context of these new common concerns will be an important realm of future study.

Notes

Chapter 1

1. Shoji Shiba was the first speaker for two days (December 14–15, 2003) at the inaugural grade 1 course.

2. "Outsourcing to the U.S.," David Barboza, pp. C1–C2.

3. The Chinese are also creating and moving to suburbs, according to an article in a China Air flight magazine in 2004. For example, Yosemite Villa and Venice Water Townhouses are housing developments built around (probably man-made) lakes distant from the center of Shanghai. The creation of suburbs requires cars, which in turn will move China further into the international competition for available oil. These suburban homes are being furnished with modern furniture.

4. In late 2005, Shoji Shiba heard that the one-year increase in minimum wages in the nine cities of Shanghai, Shencheng, Guangzhou, Suzhou, Amoi, Tenjin, Beijing, Chintao, and Dalian averaged 17 percent, with the minimum increase of 6.4 percent in Beijing and the maximum increase of 34.1 percent in Guangzhou.

5. "Thanks to Detroit, China is Poised to Lead," *New York Times*, March 12, 2003, section 3, pp. 1 and 9.

6. As part of the annual two-week factory tour of the graduate students in MIT's Leaders for Manufacturing (LFM) program.

Chapter 2

1. See also Shiba01, Chapter 27. (Some of the current text previously appeared there.)

2. The Japanese company name PLUS means plus as in English.

3. Information from a brochure from the Pudong Tiencu Mushroom Com-

pany that Shoji Shiba obtained when he visited the Shanghai company in May 2005.

4. Peter Drucker (Drucker01, Chapter 3; Drucker74, pp. 58–62, 114) famously noted that the goal of business is not making a profit; rather the goal of business is finding or creating and keeping customers by providing products or services they need. Profit, Drucker continued, is a *cost* of doing business; making a profit enables a business to attract the investors it needs and to invest in the future.

5. Noriaki Kano and Fumio Takahashi. Hinshitsu no m-h sei ni tsuite (Motivator and hygiene factor in quality). *Quality*, JSQC, 14(2), 1984. Presentation given at Japanese Society for Quality Control Annual Meeting, October 1979.

Noriaki Kano et al. Miryokuteki hinshitsu to atarimae hinshitsu (1), (2) (Attractive quality and must-be quality (1), (2)). *Quality*, JSQC, 14(2), 1984. Presentation given at Japanese Society for Quality Control Annual Meeting, October 1982.

Chapter 3

1. The information on Humanitas in this section comes from that visit, from a Humanitas brochure entitled "The Humanitas Foundation in a Nutshell (copyrighted 2003/2005 by Stichting Humanitas), and from Marrewijk04. Another source that was not available to us at the time this section was written is an interview of Hans Becker by Elisabeth Ballery (Jouslin de Noray06, Chapter 4).

2. The assessments in this subsection are primarily based on the personal experience and observation of the authors (particularly David Walden) as their parents, parents-in-law, and parents of other family members, friends and acquaintances grew too old and infirm to live alone at home. There also have been candid conversations with many health care professionals. The apparent situation in the United States is remarkably similar to the situation Humanitas is trying to address in the Netherlands, as described in the next subsection.

3. This sentence is only slightly paraphrased from the 2003/2005 Stichting Humanitas brochure.

4. Traditional elder care in the United States also puts keeping a patient safe from injury above the happiness of the patient. For instance, a facility may discourage a patient who takes a fall but is unhurt from continuing to walk and may encourage the person to use a wheelchair for fear that he or she will fall again and break something. This despite the fact that everyone, of any age, takes a spill from time to time and perhaps sometimes breaks something. But many elderly

people would choose not to give up walking in order to be more safe from falls.

At Humanitas they support a further degree of personal decision making: euthanasia is legal in the Netherlands, and Humanitas will cooperate if an individual decides to request help in dying and fits the regulatory constraints for doing so. They have about one case every three months.

5. Our discussion of ZIN is compiled from: what Shoji Shiba learned when he visited ZIN and Wim Verschuren on the site of the Brothers of Mary, Mother of Mercy cloister in Vught in the Netherlands; an article entitled "Fraters en communicatiebedrijf starten centrum 'Zin in werk' " issue 19 of the 1999 volume of `rkkerk.nl`; a three page undated document by Wim Verschuren entitled "The Movement of Mercy"; an undated two page memo entitled "Lessons from ZIN" drafted by Bertrand Jouslin de Noray after he visited ZIN with Shoji Shiba. Another source that was not available to us at the time this section was written is an interview of Wim Verschuren by Elisabeth Ballery (Jouslin de Noray06, Chapter 5).

6. American Standard edition.

7. Wim Verschuren, "The Movement of Mercy" (see note 5 above).

8. Previously named Nippon Electric Company but NEC is now its official name.

Chapter 4

1. Shoji Shiba first heard of FAVI at a European Organization for Quality summer camp in 2001. In 2002 Shoji Shiba visited FAVI in Hallencourt for a day and talked with CEO Jean François Zorbist. In 2004 Jean Lefebvre, a professor of international management at the University of Connecticut and a French speaker, visited FAVI for two days, and Shiba and Lefebvre have written a paper (Lefebvre06) describing FAVI and analyzing FAVI's management system. Jean François Zorbist has also been interviewed by Elisabeth Ballery in *Transformational Case Studies* (Jouslin de Noray06, Chapter 1). We also read a three-page document about "FAVI's Breakthrough" prepared by Martine Morel. Our descriptions and understanding of FAVI come from these sources.

2. This and the next four paragraphs are derived from Elisabeth Ballery's interview with Zorbist (Jouslin de Noray06, Chapter 1).

3. We know that *durer* already means "to last" and thus to say "to *durer*" literally means "to to last." However, we feel that using "to *durer*" in some cases will be less startling when read in English than leaving out the "to" would be.

4. Paraphrased from what Shoji Shiba heard Jean François Zorbist say during a visit to FAVI.

5. Product-out and market-in are explained in detail in Shiba01.

6. The 5Ss of shop floor management, originally practiced in Japan, mean roughly the following:

- *Seiri*: Keep only needed material at the job site.
- *Seiton*: Store materials and tools in an orderly fashion.
- *Seiso*: Clean tools, equipment, and job site.
- *Seiketsu*: Continue to observe overall cleanliness.
- *Shitsuke*: Practice self-discipline.

7. Shoji Shiba heard a presentation by Liisa Joronen, the CEO of SOL, at the European Organization for Quality 2001 "summer camp." In October of 2002, Shoji Shiba visited SOL and talked with the CEO Joronen. Liisa Joronen has also been interviewed by Elisabeth Ballery in *Transformation Case Studies* (Jouslin de Noray06, Chapter 2). Our description and understanding of SOL come from these sources.

8. The Japanese Union of Scientists and Engineers is perhaps Japan's most significant quality organization.

9. SOL CEO Liisa Joronen wrote her PhD thesis on internal rewards.

Chapter 5

1. The text in this section was derived from Maeda02 and Shiba01 and from meeting Dr. Maeda and Dr. Yamada in person.

2. Transcribed by David Walden from a presentation by Dr. Maeda at MIT on August 8, 2001.

3. Also, the rich NIMS case study provides excellent examples of several other dimensions of business improvement useful to companies everywhere today.

4. *TQM for Technical Groups* is an unusual and important book that should be read by anyone thinking seriously about how to improve the management or a company, particularly someone trying to improve the performance of a new product development organization. Kiyoshi Uchimaru died in the mid-1990s; his death was a profound loss to modern management thought.

5. Similar text describing NIMS previously appeared in Shiba01. We derived that text from Uchimaru93 and from meetings with Kiyoshi Uchimaru.

6. See note 8 on page 253.

7. Hoshin management is an advanced technique for focusing an entire organization each year on a *small* number of key improvement goals. See Shiba01, Chapter 24.

8. Figure 5-5 is our interpretation of the NIMS documentation, and the directions of the line segments are qualitative estimates.

9. A quality table shows customer requirements versus the means or metrics for implementing the requirements.

10. Shiba01, Chapter 6

11. Shiba01, Chapter 24

12. We did not create a parallel figure for Maeda Corporation because in that description we did not focus on the company's operational management system.

Chapter 6

1. Chapter 6 of Grove's *Only the Paranoid Survive* discusses methods of perceiving change and telling real changes ("signal") from apparent-but-not-real changes ("noise"). He also refers to Peter Drucker's book *Innovation and Entrepreneurship* (Drucker93), which also presents methods of perceiving change.

2. Liker04, pp. 254–257 on the "5-Why" analysis.

3. Liker04, p. 226.

4. Spear04, p. 83.

5. Shiba01, pp. 230–232.

6. Shiba01, p. 221.

7. This figure is Shoji Shiba's summary of the method and not from the creators of the method.

8. We discussed this phenomenon in some detail on page 64 of Shiba01; to paraphrase slightly:

> Each of us is able to observe different things when we look at a situation. What we see depends on what we can physiologically observe, our emotional state, our experiences, the vocabulary we have and how we understand language, our individual beliefs and mental models, our automatic ways of reacting to things, and our cultural backgrounds. . . . An important consequence is that each of us is a dif-

ferent observer of whatever there is to be seen: Since *different* people see the *same* situation *differently*, *how people see something says more about the way they observe things than it says of the situation*.

9. In fact, this is a famous example of the art of anamorphosis (a deformed image). If you close your left eye and put your right eye close to the page just to the right of the image and look at the elongated item near the floor, you are supposed to be able to see a human skull. Also, if the painting is seen in full size, the white item near the top left edge can be seen to be a half hidden crucifix. The painter Holbein perhaps had in mind that death (and hopefully resurrection) is not far away, even for the apparently prosperous and healthy men pictured in the image. Not only should we look at the periphery of an image, we may also do well to consider whether the apparent image can be mentally transformed into something more meaningful.

For a more obvious example of discerning insight from the periphery of an image, look on the Internet for a copy of Norman Rockwell's *The Runaway* which was first published as the September 20, 1958, cover of the *Saturday Evening Post*. The meaning of Rockwell's painting of a policeman and a young boy sitting at a soda fountain becomes clear when we look at the bundle on the floor at the bottom edge of the painting.

10. `tvsbrakelinings.com/goinggreen.html`.

11. Jacques de Biez, "Edouard Manet," Lecture, Salles des Capucines, Paris, 22 January 1884, quoted in Derveux98.

12. This paragraph is closely based on and the quote comes from the company's website at `www.dalefarm.co.uk/about_us/`.

13. The CEO said that in the past, before the selling-products approach, Dale Farm's description of itself focused on farmers, cows, and glasses of milk — on production and raw materials — a step farther away from customers and their healthy lives.

14. Grove99, pp. 107–108.

Chapter 7

1. Some of the following discussion was drawn from Shiba03, pages 206–210.

2. We exclude "why" from this list to highlight the frequent case in which causation, unlike other observable aspects of an event, is a matter of speculation

or inference. Of course, apparent causation is sometimes directly observable and can, therefore, be described in terms of who, what, when, where, and how.

3. This process is also described in Shiba05a and Shiba06c.

4. Push and pull in this type of model are derived from Lillrank89.

Chapter 8

1. Teradyne rotates various high-potential managers through the position of corporate TQM officer for 1.5 to 2 years each as a way of imbuing these individuals with Teradyne's TQM culture and training them for bigger roles in the company.

2. The case study of Teradyne Aurora has been well documented in Harvard Business School case studies (Bower97, Bower98). We had the good fortune of having Alex d'Arbeloff, founder of Teradyne, tell us the story. Similar text describing Teradyne Aurora previously appeared in Shiba01. Another source is Challapalli00.

3. Similar text describing Seiko previously appeared in Shiba01.

4. This model is also sketched in Shiba01, pages 676–681.

5. The scientific method is capable of producing great change. It is the most effective and efficient method of understanding what is going on in real life and transforming it, if we can enable ourselves to use it. Parts 1 and 2 of this model provide the motivation and unfreezing of previous methods that enable the discipline of the scientific method.

6. Eizaburo Nishibori was an engineer at Nippon Telegraph and Telephone Corporation (NTT); he studied quality deeply under W. Edwards Deming, who introduced statistical process control to Japan. Mr. Nishibori also led the first expedition from Japan to the South Pole.

7. Of course, the ultimate goal is not just to create some arbitrary new thing; it is to create something new for a market the company can plausibly enter.

8. Noriaki Kano suggested the first three categories to Shoji Shiba.

9. "Innovation and Evolution: Reflections on a Life in Science," Leo Esaki, undated extended abstract, `www.journal.tsinghua.edu.cn/myweb/english/98n1/980106.html`.

10. Meyers05, pp. 8–11.

Chapter 9

1. Similar text describing the innovator's dilemma previously appeared in our previous book, Shiba01.

2. Shiba01, page 587.

3. Michael Erard, "Where to Get a Good Idea: Steal It Outside Your Group," *The New York Times*, May 22, 2004, p. A17.

4. We see a theoretical parallel for this in Ikujiro Nonaka's model of of the elements of tacit knowledge and articulatable knowledge (Nonaka95).

5. This passage is paraphrased slightly from pages 17–21 of Tushman97.

6. Shoji Shiba attended Michael Tushman's May 27, 2004, workshop; David Walden attended Charles O'Reilly's September 12, 2003, workshop.

Chapter 10

1. Shiba01, chapter 28.

2. "My CV" column, *Nikkei* newspaper, March 14, 2001. The "My CV" column features personal histories of great CEOs.

3. "My CV" column, *Nikkei* newspaper, April 20, 2003.

4. Email of October 23, 2005.

5. Email of October 22, 2005.

6. `lfm.mit.edu/alumni.html`.

7. "MIT: The Impact of Innovation," report from the Bank of Boston Economics Department, March 1997 (`web.mit.edu/newsoffice/founders/`).

8. `web.mit.edu/vms/`.

9. Staelin was another member of the MIT commission that generated the *Made in America* book.

10. `web.mit.edu/vms/`.

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About the Authors

Shoji Shiba was awarded the 2002 Deming Prize for Individuals. The award citation honored Shoji Shiba for:

1. Contributing to the academic world through efforts to apply quality in industry and throughout the region and society from the viewpoint of social science.
2. Demonstrating the effectiveness of Japanese way of TQM through wide diffusion and practice in industry in Hungary and the United States.
3. Contributing to the Japanese quality society by introducing the different viewpoints of social science and outside of Japan, i.e., a global view.

In 2004 Shoji Shiba's book *Breakthrough Management* was awarded the Nikkei QC Literature Prize.

As an international expert in TQM, Dr. Shiba is responsible for disseminating the practices and methodologies of TQM to the industries and governments of

many countries, including Chile, China, France, Hungary, India, Ireland, Italy, Malaysia, Norway, Portugal, Spain, Sweden, Switzerland, Thailand, United Kingdom, and the former USSR.

In honor of his work in Hungary, that country established the IIASA-Shiba Award, presented annually to organizations, groups, and individuals who make significant contributions to TQM. Also, the president of the Hungarian Republic has bestowed its Small Cross of Order of Merit upon Dr. Shiba, for the high value and generous activity which Dr. Shiba has accomplished in the field of quality improvement and management in Hungary. In 2005 the European Organization for Quality awarded Shoji Shiba the Georges Borel Medal for continuous contributions to the development of the field of quality management in Europe by a person from outside Europe.

From 1990 to 2004 Shoji Shiba was an adjunct or visiting professor at MIT, where he taught graduate courses at the Sloan School of Management and in the Leaders for Manufacturing program. He also is a professor emeritus of Tsukuba University in Japan where he was a professor of business administration until 1996. From 1996 to 2000 Shoji Shiba was dean and professor of business administration of the School of Applied International Studies of Tokiwa University in Japan.

In 1989 Dr. Shiba helped establish the Center for Quality of Management (CQM) in Cambridge, Massachusetts, a nonprofit an international consortium of companies created for the purpose of sharing methods and experiences of improving business performance.

Shoji Shiba was elected to membership in the International Academy of Quality in 2002 and elected as a Companion of the UK Institute of Quality Assurance in 2006.

David Walden earned an undergraduate degree in mathematics at San Francisco State College and did graduate study in computer science at MIT. After college he worked at MIT Lincoln Laboratory, Norsk Data (Oslo, Norway), and Bolt Beranek and Newman Inc. (Cambridge, Massachusetts).

At Bolt Beranek and Newman, he was an original member of the team that developed the ARPANET, precursor of the Internet. In his more than 30-year business career he held a succession of technical, technical management, and general management positions.

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Mr. Walden first met Professor Shiba in 1990, when Mr. Walden was a member of the team of executives from Boston area companies that designed the operation of the Center for Quality of Management. Since that time the two men have written papers and books together and have jointly taught several courses, particularly at MIT's Sloan School of Business and for the Center for Quality of Management.