



# KNOWING IN FIRMS

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Understanding, Managing and  
Measuring Knowledge

Edited by  
Georg von Krogh, Johan Roos  
and Dirk Kleine

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Measuring Knowledge*

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## **In Memory of Gunnar Hedlund**

This book is dedicated to the memory of Gunnar Hedlund, a great contributor in the management field, who was born on 14 December 1949 in Skellefteå, Sweden, and passed away on 18 April 1997 at a hospital in Stockholm. Gunnar studied at the Stockholm School of Economics (SSE), where he received his master's degree in 1972. He completed his PhD in 1976, at the age of 27. That same year, a new institute was formed at SSE: the Institute of International Business (IIB), founded by the leading Swedish industrialists Ruben Rausing and the two brothers Marcus and Jacob Wallenberg. Gunnar was committed to the Institute from the very beginning, and in 1980 he became the Director of IIB, a position he held for 10 years over the 20-year period he was active at IIB. Gunnar led the Institute to the internationally renowned position it enjoys today.

Gunnar became a full Professor at SSE in 1988 where, amongst other accomplishments, he actively participated in creating two other important institutes at SSE: the European Institute of Japanese Studies and the Centre for Advanced Studies in Leadership. Over the years, Gunnar sat on the boards of numerous academic institutes and organizations, and served on the editorial board of some 10 academic journals. He spent long periods at the Wharton School, University of Pennsylvania, and Stanford University. Gunnar published many important books and articles in the area of international business and organization theory. He was the father of important management concepts that have had a great influence on many of us. He constantly sought new perspectives and had a unique ability to cross over disciplines – seeing new research opportunities. We will remember Gunnar as a truly exceptional scholar. While his research has come to an end, his spirit and works will live on in the continuing efforts of the Institute.



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## Editors

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**Johan Roos** is a Professor at the International Institute for Management Development (IMD), Switzerland. He researches how companies become and remain healthy enough to keep adapting to and shaping their own environments. Related areas of research include: knowledge development and ways of knowing in companies; concepts and practices of intellectual capital; the firm as a complex adaptive system; and effective strategy processes in emerging industries. Professor Roos has consulted widely on these issues for both US and European corporations and associations, and frequently presents these ideas at international conferences for both management scholars and practitioners. Professor Roos is the author, or co-author, of more than 40 articles and book chapters, and 12 books. He is Swedish.

Before joining IMD as a Professor of Strategy and General Management, he was affiliated with the Norwegian School of Management, the Wharton School of the University of Pennsylvania, and the Stockholm School of Economics. He was awarded a PhD degree in international business in 1989, and a MSc degree in agriculture in 1985.

**Dirk Kleine** is a Research Associate and doctoral candidate at the University of St Gallen, Institute of Management, in Switzerland. He holds a bachelor degree from Berufsakademie Mannheim, Germany, and an MBA from Lancaster University, United Kingdom. He has been working on different research projects with major European multinationals. Those projects have mainly focused on the pharmaceutical industry and cooperative strategies. Currently he is conducting empirical research on the changing roles and functions of strategic planning departments, involving companies such as BMW, Bayer, Hewlett-Packard and Siemens. He is co-author of a book on environmental information systems and has co-authored articles on knowledge transfer, the pharmaceutical industry and argumentation theory.

## Contributors

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**Peter Gomez** was born in 1947 in St Gallen, Switzerland. He followed graduate and doctoral studies at the University of St Gallen. From 1977 to 1978 he was Visiting Professor at the State University of New York; from 1978 to 1989 he was Senior Vice-President of Switzerland's leading publishing house Ringier Group and press distribution house Distral Group; and in 1989 he became founding partner of Valcor, consultants for strategic management and M&A. Since 1990 he has been Professor for Management and Organization and Director of the Institute of Management at the University of St Gallen, and from 1995 to 1997 Dean of the Business Administration Faculty. He is the author of 10 books and over 50 other publications on strategic management, systems thinking in management and creating shareholder value.

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**Rodrigo Magalhães** is currently Research Fellow and PhD candidate at the London School of Economics, Department of Information Systems. His research topic is the impact of information systems implementation on the organization's knowledge system. Other research interests include information systems and organizational change, and inter-cultural management. He is faculty member of the Department of Economics and Management at the Portuguese Catholic University in Lisbon. He holds an MBA from the University of Sheffield, an MA from the Leeds Metropolitan University, and a BA from the University of Natal, South Africa.

**Donald A. Marchand** (PhD, MA, UCLA) is Professor of Information Management at the International Institute for Management Development (IMD). He was formerly Dean and Professor of Information Management at the School of Information Studies, Syracuse University and Professor of IS and Director, Institute for Information Management, Technology and Policy, College of Business Administration, University of South Carolina. Professor Marchand is a consultant and speaker to numerous corporations and government organizations on the strategic management of information and technology. His research interests include the strategic role of IT in enterprise transformation and business process redesign, managing information and knowledge assets, and reengineering IS/IT strategies and organizations.

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**Günter Müller-Stewens** studied business administration at the University of Regensburg. He was Research Assistant at the Department of Statistics and at the Institute for Organizational Science at the University of Munich. He did a research stay at both Harvard Business School and Stanford

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**Gilbert Probst** is Professor for Organization and Management and Director of the MBA programme at the University of Geneva, Switzerland. He did his PhD and *habilitation* at the University of St Gallen, Switzerland. Professor Probst has written more than 20 books and over 80 journal articles, mainly in the fields of systemic and cybernetic thinking in management, problem solving, organizational learning, developmental management and knowledge management. He is a member of the board of Neue Warenhaus AG (EPA/UNIP), SKU and Kuoni Travel (all in Switzerland) and a consultant to many multinational corporations, including Hewlett-Packard, Ciba-Geigy, Winterthur Insurance, Hilti and Swissair. In 1995 he was a co-founder of the Geneva Knowledge Group.

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# INTRODUCTION

*Georg von Krogh, Johan Roos and Dirk Kleine*

This volume is a collection of chapters that explore the emergent body of research on knowledge management in the field of strategic management. It is our conviction that knowledge management is one of the most exciting areas of inquiry in the field of strategic management. Thus, we have tried to select chapters that contribute with new concepts, issues and ideas to the understanding, management and measurement of knowledge in organizations. We have also attempted to bring together some of the leading researchers on knowledge management from a wide range of academic institutions in the US, Japan and Europe. As the reader will notice, all contributors share our view that knowledge is at the centre stage of organizational life. Hence, we hope to offer much food for thought for further advancing into the knowledge economy. It is our aim that this book serves as an important resource for researchers and reflective practitioners interested in knowledge management.

We want to acknowledge the support of our institutions, the University of St Gallen and the International Institute for Management Development (IMD), in preparing this book. It has also been a considerable pleasure working with all of the authors in the book and we thank them for their patience and contribution. We are grateful as well to the people at Sage Publications, especially to Rosemary Nixon and Hans Lock for their help in turning our manuscript into a form that makes a real contribution to the realm of knowledge management.

## **Structure of the Book**

The contributions in the book are arranged in two main parts:

Part I: Understanding Knowledge in Organizations

Part II: Managing and Measuring Knowledge in Organizations.



Before we start to think about knowledge management, we need to clearly understand how 'knowing in firms' takes place. Therefore Part I 'Understanding Knowledge in Organizations' covers topics such as how and why individuals and organizations come to know, images and types of knowledge and the potential links of concepts of organizational learning and trust with theories of knowledge. The contributions in Part I aim to uncover and discuss the theoretical assumptions underlying research on knowledge in organizations and to conceptualize future research in the field.

Having understood the nature of knowledge, we can proceed to discuss methods and tools of knowledge management. Knowledge management is so challenging because we need to discard our very ingrained notions of 'control', 'structure' and 'goal rationality'. Taking these challenges into account, Part II 'Managing and Measuring Knowledge in Organizations' brings forth practical ways of managing knowledge. The contributions outline different models of knowledge development and some contributions illustrate their application through case studies of various organizations. A wide range of issues is covered in Part II such as knowledge enablers and drivers, knowledge creation processes and clustering knowledge management tools. Furthermore, the issue of how to determine and leverage the value of knowledge in organizations is explored. The authors outline concepts such as intellectual capital and the value of core processes in the organization.

The key concepts and ideas of the different chapters are summarized in the table shown.

*Key ideas and concepts in the contributions*

Chapter	Author(s)	Ideas and concepts
1	Bertels/Savage	Highlighting the tough questions to inspire research
2	Venzin/von Krogh/Roos	Contextualizing research; epistemological assumptions; knowledge appearances; knowledge applications
3	Blackler/Crump/McDonald	Images of knowledge; knowing as a process
4	Magalhães	Epistemological foundations of organizations; autopoiesis; languaging
5	Huemer/von Krogh/Roos	The nature of trust; linking trust and epistemology
6	Nonaka/Umemoto/Sasaki	Theory of knowledge creation; knowledge spiral; five-phase model of knowledge creation
7	Ichijo/von Krogh/Nonaka	Knowledge enablers; knowledge intent; care; conversations
8	Vicari/Troilo	Innovation; error production; learning process
9	Schüppel/Müller-Stewens/Gomez	Knowledge spiral; instruments for knowledge development
10	Probst/Büchel/Raub	Resource-based view; organizational learning

11	Marchand	Framework for linking knowledge and information; intellectual capital
12	Kanevsky/Housel	Learning-knowledge-value spiral; Kolmogorov complexity; value of core processes in organizations

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## On the Contributions

In Chapter 1, T. Bertels and C. Savage develop a research agenda for the field of knowledge management. They argue that the challenge for research is to get the questions right in order to advance into the 'knowledge era'. The questions centre around assets and aspirations, boundaries and boundarylessness, change and continuity, contribution and coherence, culture and context, information and infostructures, leadership and language, learning and leveraging, measurement and motivation, transfer and transparency, and values and valuation. One set of questions can open a new frontier in a seemingly unrelated area. Rather than giving definitive answers, this chapter poses tough questions about where further research and scholarship are needed to help build a theoretical and practical base for a knowledge-based economy.

In Chapter 2, M. Venzin, G. von Krogh and J. Roos explore the concept of knowledge within the field of strategic management. A research map is developed that facilitates further theory building and gives an overview of existing literature in this field. Arguments on why the issue of knowledge is important for strategy are matched with underlying epistemological assumptions, knowledge appearances and applications. The authors argue that the epistemological positioning of new concepts and the retrofitting of existing concepts will facilitate scientific (and managerial) conversations because they enhance the connectivity of existing work and open up research in underexplored areas.

Chapter 3 also offers an overview and critique of common approaches to understanding knowledge in organizations. F. Blackler, N. Crump and S. McDonald first review common images of knowledge, as embodied, embedded, embrained, encultured and encoded. They argue that the thrust of much of the recent literature on knowledge, competency and learning has been to suggest that embrained, encultured and encoded knowledge is of increasing significance to wealth creation. Further, this chapter develops a critique of the common approaches to understanding knowledge by suggesting that knowledge is better analysed as an active, pragmatic process that is culturally situated, artefact mediated and socially distributed and which occurs within communities of practice. The authors conclude with a discussion of what this approach means for the management of knowledge in organizations. Six key themes are highlighted: knowledge acquisition, knowledge planning, domain innovation, boundary innovation, organizational learning and new approaches to collaboration.

In Chapter 4, R. Magalhães aims to clarify various trends and 'schools of thought' from the relevant literature in organization theory by bringing together three metaphors which are usually dealt with separately: organizational learning, organizational knowledge and organizational memory. A new and unifying approach to organization knowledge based on autopoiesis theory is introduced and the increasingly relevant role of language in organizational discourse is emphasized. Another objective of the chapter is to highlight contributions to these issues which are outside the mainstream positivist research paradigm in the organization sciences. These contributions are gaining ground around a new pole of attraction that can broadly be described as the postmodern movement.

Chapter 5, written by L. Huemer, G. von Krogh and J. Roos, focuses on the managerial issue of trust. At present, there is no consensus on how to approach or view this conceptually complex concept within the realms of strategic management and organization theory. The authors suggest that conditions of trust are essential for organizational knowledge development and transfer to occur. Thus, one of the most important roles which trust may play focuses on issues related to corporate epistemology. Guided by different epistemological perspectives, the aim is to develop an understanding of trust and the dynamic relationship between trust and knowledge.

In Chapter 6, I. Nonaka, K. Umemoto and K. Sasaki present three cases of Japanese companies, namely Sharp, National Bicycle and Seven-Eleven Japan. They first introduce their theory of organizational knowledge creation. This is followed by case descriptions that outline how these three companies have developed business process innovations as knowledge-creating systems to acquire consumers' latent wants. The authors argue that those knowledge-creating systems are not the results of often inhumane reengineering activities, which to a large extent rely on information technology, but are based on human beings' intellectual ability and mutual trust.

The goal of Chapter 7 is to develop a richer understanding of the problem of creating, capturing and capitalizing on knowledge-based competences in firms. K. Ichijo, G. von Krogh and I. Nonaka argue that despite the growing interest in the management of knowledge in firms, there is a lack of knowledge with respect to the micro-level process of how knowledge is enabled in firms. While providing insights on the subject, the chapter is still exploratory and at the stage of theory building rather than theory testing. The authors study this topic – enabling the management of knowledge in firms – by pursuing the discovery of theory, i.e. grounded theory, intending to provide theoretical and management implications for knowledge management in firms based on a case study on MYCOM, a corporate brand for Maekawa Seisakujo (Maekawa Manufacturing Company). The primary result of this approach is a conceptual model which highlights key knowledge

enablers and shows how they will contribute to the management of knowledge-based competences in firms.

In Chapter 8, S. Vicari and G. Troilo propose a new way to face complexity and, consequently, a new role for management. The firm is considered as a cognitive system which enacts and makes sense of its own environment from its individual point of view. Following the idea that the environment and the market are cognitive constructions of the firm, a new model of innovation as a learning process is developed. The relevance of the concept of error and a taxonomy of error production in management are described. These topics raise a number of organizational issues which are briefly discussed in the last part of the chapter.

In Chapter 9, J. Schüppel, G. Müller-Stewens and P. Gomez argue that knowledge management has to comprise all activities regarding production, reproduction, distribution, utilization and multiplication of relevant knowledge. In concrete, knowledge management can be implemented as a process along the following four dimensions. First, the process has to focus on the subjects of knowledge by optimizing the ratio of internal and external knowledge elements within the value chain and internalizing necessary external knowledge into the organization. Second, the process has to focus on the relevance of knowledge in a competitive environment. Thereby the company needs to identify the present and future knowledge potentials for building sustainable competitive advantages. Third, the process must increase the availability, communication and transfer of knowledge by focusing on both implicit and explicit forms of knowledge. Fourth, the richness and validity of knowledge have to be determined. This can be discussed using a dichotomy of knowledge experience and knowledge of rationality. The authors argue that the goal of systematic knowledge management must be seen in the modelling of a dynamic knowledge spiral that builds on the four process dimensions by using specific, knowledge-oriented instruments.

The purpose of Chapter 10 by G. Probst, B. Büchel and S. Raub is to link 'the organizational learning perspective' and the 'resource-based view' in order to show how the development of organizational knowledge through learning can lead to a competitive advantage. From the perspective of the resource-based view, the possession of unique knowledge can be seen as a strategic resource which provides the foundation of competitive advantage. From the organizational learning perspective, knowledge can be seen as the product of a learning process which ensures continuous adaptation. Propositions are offered which show how learning to develop organizational knowledge can be a means of ensuring a sustainable competitive advantage.

In Chapter 11, D. Marchand argues that in many discussions of 'the learning organization', 'change management' and 'competitive advantage', the practical links between what managers think about these concerns and how they 'manage' knowledge and information are often weak to non-existent. This is the managerial issue addressed in this chapter. The

intent is, first to suggest a framework for the continuous conversion from information to knowledge and knowledge to information, and second to illustrate the business value of managing these conversion processes through the pioneering efforts of one company – Skandia – in visualizing and measuring ‘intellectual capital’.

In Chapter 12, V. Kanevsky and T. Housel claim that the understanding of how to accelerate the conversion of knowledge into value (i.e. money) is the real challenge in the information age. The ‘knowledge payoff’ occurs when a corporation’s most valuable intangible asset – knowledge – is converted into bottom-line value in the form of a concrete, saleable product. The value of an organization’s core processes can be derived from the amount of knowledge required to reproduce their outputs. Process knowledge becomes a surrogate for the final process output. This chapter focuses on the fundamental relationship between the returns that an organization derives from its processes and the knowledge embedded therein.

PART I

**UNDERSTANDING  
KNOWLEDGE IN  
ORGANIZATIONS**

---

1

**TOUGH QUESTIONS ON KNOWLEDGE  
MANAGEMENT**

*Thomas Bertels and Charles M. Savage*

In a very short time, industry has discovered *knowledge, intellectual capital* and *knowledge management*. Tom Stewart of *Fortune* magazine was one of the first to chronicle this development in his articles on 'brain-power' (Stewart, 1991) and 'intellectual capital' (Stewart, 1994). Word is out and the conference factories have begun to schedule conferences on knowledge management. They sense business process reengineering (BPR) has lost its lustre and they want to be the first to offer the new topic. Surely consulting firms will suddenly proclaim they are also in the knowledge management business, and incorporate the latest buzzwords into their brochures, just as they did with BPR. More and more CIOs will change their title to CKO, chief knowledge officer.

Then, after three years of intense fluff, the lemmings will be on to their next topic, without ever having really mined the subject of knowledge. Quick solutions will be bandied around, as if a few silver bullets will do the trick. When they do not work, people will claim the knowledge business is a sham, try to clear the mess the consultants left behind and return to business as usual.

What if we agreed at the outset to do our homework, even if it were to take 5 or 10 years? What if we follow Albert Einstein's insight that the world we have made, as a result of the level of thinking we have had thus far, creates problems that we cannot solve at the same level of thinking at which we created them? What if we approached knowledge and intellectual capital with a sober and humble realization that, if we do our work right, we will indeed be laying the foundation for the next economy? The stakes are much higher than just increasing productivity by 30% or even 300%. What does this mean?

We face a major transition, as we begin to leave the industrial era behind and enter the knowledge era. Remember, it took from 50 to 150 years to move from the agricultural to the industrial era. Agriculture did not die. We just brought an industrial approach to agriculture so that 5% of our population farms instead of 65%. In the future we will still have industry, but we will understand and manage it from a new perspective, that of the knowledge era.

In other words, we are beginning on a 10- to 50-year transition to a knowledge-based economy. Likely we will find that all our goods can be produced by less than 10% of our population. What do the others do?

In addition, we are learning that we need to be more responsible with our natural resources. We cannot continue to abuse nature's resources or to pile high our rubbish for future generations to tend.

As we produce more with fewer people, our income distribution mechanisms are breaking down. Persistent high unemployment is one indication. And it cannot be solved just by more government transfer payments. Instead, we need to awaken people to the value of their own knowledge, energy and aspirations, so they feel genuinely excited about initiating their own entrepreneurial efforts (Handy, 1990). A four-person company can have almost the same presence on the Internet as a large multinational one.

It is unlikely the industrial era is sustainable in the form we have known it. We now realize that narrowly defined tasks and command-and-control hierarchies may work fine in stable environments. They are hopelessly out of date for the emerging knowledge era. The danger is that with the ever increasing pace of change, we may spend so much time on redesigning the old corporate structures that we have no time left to capitalize our efforts and deliver results. Some may wonder whether somebody has changed the rules of the business game and forgotten to tell.

Moreover, we are discovering how poorly the industrial era model was designed from a human perspective. We have designed into our companies a culture of distrust. Instead of valuing people, we have fostered a climate where people do not feel valued for what they know or what they can do. We have focused on hands and not heads and hearts. If we want to move into the knowledge era, our biggest challenge is a cultural one. And as we know, cultural change does not come easy.

We are convinced that our first challenge is to get our questions right. Only as we probe, test and experiment will we begin to uncover the real wealth of the knowledge era. We can also envision a close working partnership between the universities and industry, services and governments, similar to the Fraunhofer model in Germany.

We will have to develop new capabilities and a fresh understanding to create new opportunities. The challenge is not to adapt existing concepts to new situations, but to generate creative ideas about business and values. The dominant logic of the industrial era is a barrier to reaching an understanding of the knowledge era. Perhaps we are again standing with Galileo, realizing the contradictions of traditional wisdom, and reaching for a new order?

What are some of the questions which will help us co-create the knowledge era? Rather than giving definitive answers, we have formulated some of the tough questions on which further research and scholarship are needed. Our goal is to inspire industrial and academic researchers to help build a theoretical and practical base for a knowledge-based economy.

We have developed a wide range of questions centred on the following interrelated topics:

- assets and aspirations
- boundaries and boundarylessness
- change and continuity
- contribution and coherence
- culture and context
- information and infostructures
- leadership and language
- learning and leveraging
- measurement and motivation
- transfer and transparency
- values and valuation.

One set of questions can open a new frontier in a seemingly unrelated area. Honest probing is needed now, rather than glib answers.

### **Assets and Aspirations**

Typically *assets* are recognized items of worth. We count our assets on our balance sheet, we put asset numbers on machinery and we recognize that these assets depreciate. As we move into the knowledge era we are faced with more than just things. Ideas begin to take on major business significance. Yet, we hardly know how to put asset numbers on them, unless they be patents or trademarked items.



Gordon Petrash and his colleagues at Dow Chemical have done an excellent job in developing an information asset management programme which reviews patents and other nuggets of know-how. They are anchoring these within the concrete business context of the enterprise. Their work is leading to a better understanding of the valuation of their patent portfolio, and hence to increased profitability.

This is just the start. We are beginning to understand that good ideas, processes and infrastructures can appreciate with usage. Likewise, we are beginning to realize that as we as individuals get better at recognizing and valuing the positive experience and capabilities of our colleagues, we can generate value for the company.

These developments beg a whole series of new questions:

- Are ideas assets?
- How do we account for ideas which appreciate with usage?
- How do we measure depreciation of ideas that have outlived their usefulness?
- How do we value the knowledge and time of our customers?
- Are these assets which accrue to our benefit?

We have just been through a period of extreme downsizing and asset-stripping to improve financial ratios. These practices often ignore the *hidden value* in business units and capabilities in terms of core knowledge. How can we better visualize the hidden intellectual capital within and between our organizations so we can move out of the traps of short-term financial thinking? How can we learn from the excellent work of Professors Ikujiro Nonaka and Hirotaka Takeuchi (1995) on 'the knowledge-creating company'?

We are finding that it is not enough just to focus on what we know. It is also important to understand what we as individuals, functions or companies do with what we know. In other words, our *aspirations* are also very important. Our aspirations are rooted in our deep values. They are the things for which we have a passion.

They are the energy sources of our actions. They are the drives for innovation, creativity and excellence. They point us to the future and its possibilities.

- How do we learn to listen to one another's aspirations, especially as we launch new teaming efforts?
- What models can support expression of aspirations so that they become visible and valued 'idea assets'?
- How do we learn to listen not just to our customers' needs and problems, but also to their aspirations?
- What are they trying to do to better respond to their customers, and how can we support them best?
- What is our contribution to the total value chain?

- How do we stop the vicious circles of mistrust which destroy our capabilities to learn, to live our expectations and to create new products and services?

If we can find answers, it is likely that our genuine human aspirations will fuel a new renaissance of economic activity.

### **Boundaries and Boundarylessness**

The marketplace has become global, and the effects are visible everywhere. Instead of a limited number of competitors in our domestic markets we now face countless enterprises that offer the same or something similar. The niches have lost their exclusive touch, and it seems there is no place left to hide. As long as we could oversee the market it was enough to be better than the competition. Where do we position our business within the global context of the knowledge era? How can we set organizational *boundaries* that best utilize our specific set of competencies and best match that of our partners in the value chain? What is our vision, and where are our strengths? Instead of focusing on our present product range, what business activities will best suit our knowledge portfolio? Instead of using competition as the only measurement, we need to focus our efforts by improving our ability to deliver unique contributions.

Focus is needed to create uniqueness. We must search for excellence to be able to create something that nobody else can offer. Some questions might describe the challenges we face:

- How do we identify our core competencies, our unique abilities, our core knowledge, and what does it take to sustain and develop these capabilities further than everybody else?
- What business activities contain our most valuable ideas and knowledge? The ability to focus organizational activity and knowledge creation is crucial for survival.
- We are able to identify our core business and core markets, but how do we assess our core ideas?
- In the global village, how can we be focused and committed to our specific capabilities, and at the same time be able to see the whole picture?

ABB's Percy Barnevik translates *boundarylessness* into 'think global, act local'. Matching of local competence with global ideas calls for participation and communication across functional, organizational and cultural frontiers. In an era where cross-organizational and cross-cultural teaming will become an important means to create value and generate new ideas, we must unlearn our beliefs about 'us and them'. How can we

understand our contribution and best match our abilities to our partners within the value chain? This requires dialogue and trust, confidence in our skills, and valuing and recognition of others and their work.

The same boundaryless sense is needed when we work with our internal customers. How can we see the larger context when communicating across functional barriers in order to best match our efforts instead of optimizing our job box? This will affect leadership as well as structure. The role of executives will shift from controlling their turf to initiating real dialogue so that tacit knowledge can be made explicit. How do we create double-win situations which transcend simple compromise? What models and tools will support boundaryless behaviour?

We must match our uniqueness to others' unique abilities. This is only possible when we see others' contribution to the value chain, built on a common set of values and on a culture of valuing. Traditionally, we have limited our thinking to the border of our job box. What can we do to support workers in understanding their position within the overall context whilst getting a strong sense of pride out of what they are doing?

### **Change and Continuity**

Every new business book begins with a mantra on *change*. Change management is the battle-cry of every consultant. And yet, change is tremendously threatening, because when things change, people's worlds come unstuck. All that seemingly made them important is disappearing. It is little wonder that, in spite of the cries for change, constant change and more change, resistance is unbelievably strong in our organizations. Perhaps the problem starts with the concept of 'change'. Perhaps we should think in terms of *transformation*.

Transforming our organizations into knowledge-based businesses asks for much more than developing a new set of buzzwords. The task to solve is similar to Otto Neurath's metaphor of sailors on the open sea who must reconstruct their ship but are never able to start from the bottom; they must make use of some of the drifting timber from the old structure, but they cannot put the ship into dock to start from scratch. During the transformation we must stay on the old structure and will have to deal with new problems that at present we can only envision.

In going through the transformation we need help in terms of both guidelines and models. We need ideas to experiment with, which help to build on existing ground and yet are stable enough to carry over to the new economy.

- What strategies can we apply to prepare today's organizations for the shifts to be expected?

- How do we weave the ideas of knowledge and its value into the organization and be nevertheless able to function in the present business situation?
- What difficulties can be expected?

How is *continuity* possible in a fast-moving business world? What gives us a sense of consistency and security, what makes it possible to continually let go in order to reach for the next trapeze bar? It may well be that change becomes livable when we change our corporate cultures from a culture of devaluing to one of valuing. If people were to feel they are taken seriously by their colleagues, subordinates and superiors, then would they have less need to hold on to the outer signs of importance, such as title, office size and parking space?

We are in desperate need of a model allowing for quick change that is based on firm, stable beliefs. We need corporate cultures where values are strong and firm enough to encourage everybody to participate and contribute. Brian Hall (1993) has been doing a wonderful job of helping companies make explicit the tacit values of individuals and organizations so they can create a more collaborative and creative environment.

The present realities show the complete reverse picture: we build cultures on values that are vague and counterproductive, we try to manipulate our culture in order to achieve better financial results, but we ignore the need for consistent and shared values. Using culture as a weapon to increase productivity has failed, and it has resulted in fear and resentment towards quick-fix solutions.

Cynics might say that we are pretty good at reflecting the pace of outside change in our efforts to publish mission statements and develop lists of values. But these cynics know we are ready to abandon them as soon as we have to change our behaviour in accordance with them. Are there ways companies are able to make cultural change stick?

A business based on sharing individual ideas and beliefs calls for a supportive and open culture, such as Oticon's in Denmark. How do we develop stability in our values and valuing, so that we can be extremely dynamic in allocating and reallocating our resources? In short, how do we create stability and consistency in our values so we can dynamically respond to ever changing business opportunities?

## Contribution and Coherence

Although Adam Smith understood the value of the division and sub-division of labour, he also saw its potential negative effect. Buried deep in his *The Wealth of Nations* (1987), way past the model of the pin-making factory, is a comment to the effect that this mode of work could potentially be detrimental for the human spirit. The continuous repetition of

work will draw on such a small portion of the person's capabilities that they will likely atrophy. In essence, this model had the possibility, as Smith understood it, of making workers stupid. What kinds of *contribution* can workers make if their capabilities are significantly underutilized and their spirits are ignored?

In his book *Jobshift*, William Bridges (1994) documents the shift away from narrowly defined jobs into a model of organizations which begin to excel at teaming and reteaming capable people. Significantly, we are moving to an approach which needs to use the whole person, and all the person's talents.

Moreover, no one person has all the insights, so we are finding it is very important to be aware of the richness of diversity in the workplace, facing questions like:

- How do we better understand this shift?
- How do we work with human resources and information systems to build this dynamic workplace?
- What infostructure is needed, and how do rewards and recognition change?

We are finding real value in building upon the diversities of backgrounds of our people, be they educated as engineers, in finance or in the humanities. Each has a significant contribution to make. Moreover, we are finding diverse workforces offer a richness of insight. And as we begin to work more closely with other companies through virtual enterprising, we learn to build upon the diversity of cultures in one another's organizations.

Typically we want to know what makes workers satisfied. There have literally been thousands of employee satisfaction studies and surveys over the last 50 years. Unfortunately satisfaction can be very ethereal. I may be hungry, i.e. dissatisfied with my physical condition, but then when I eat I am satisfied, at least for a short while. Studies of worker satisfaction made sense when they were doing hand work. But when we are involved in head work, then satisfaction may not be the best theme. Instead of asking, am I *satisfied* with my work, it would be more appropriate to ask, am I *significantly involved* in what I am doing? How can I contribute?

Traditionally, we did not care about contribution: we defined the output and then we could calculate the required input. This model only works when the definitions are clear and the conditions are stable. The more we deal with vague ideas and knowledge, the more we realize that we cannot define the input any longer, that we depend on the contribution and that we cannot enforce the contribution, because that force is counterproductive. Contribution asks for common values and supportive sharing. What cultural values will support contribution but avoid

the lowest common denominator? How can we match individual talents so that we create something nobody can achieve on their own, involving the best of everyone, making best use of this input?

We might even ask ourselves if we need to unlearn our obsession with competition as the driving economic force. What does it take to bring together the individual capabilities? When we compete we try to exclude, to position ourselves, we fight to make our point. For sure, the knowledge era will know competition, but the definition of 'us and them' is likely to change towards a more dynamic understanding, spanning across functional and organizational barriers.

How do we link the individual with the organization to create *coherence*? Realizing that we will have to abandon fundamental beliefs about business raises the question of whether such soft, fragile bonds as culture, values and language will tie an organization together in the face of organizational realities, where individual and functional egoism can only be mastered by applying pressure and dependence. It seems obvious that a new kind of organization will have to offer more to its co-workers than it did before. The conflict between unleashing the full potential of the human spirit and at the same time achieving corporate goals asks for a new quality of relationship. How can we reflect this kind of relationship? How can organizational focus and individual goals be matched?

Maybe we will have to unlearn our ideas about employment and work contracts in order to be able to reflect this new type of relationship. When knowledge becomes the dominant resource we must face the fact that the worker is the owner of the resource. This touches the roots of capitalistic theory and of established beliefs about ownership and dependence.

Ownership of resources equals power. How can we translate this into structures that address this fact? Maybe we will have to rethink our organizations as partnerships or as coalitions that are sustained only for a limited period?

The traditional organization was bound together by power and pressure, and the damage was covered by monetary compensation. But what is the equivalent in the knowledge era that ties the organization together? What can organizations offer, when the success of an organization relies on its capability to involve every brain it can reach as much as possible? How do we create common sense and direction when everybody is involved? How do we achieve coherence in the diverse demands of an ever changing market?

## Culture and Context

The 1980s raised the idea of corporate *culture*, but the topic soon vanished from the agenda when it was realized how much effort it takes

to turn a company around. The serious attempts of many to change the fundamental beliefs of a whole enterprise have been seen to fail, and yet there are too few examples like GE, Oticon in Denmark and Metler-Toledo in Germany where the mechanisms of large-scale change can be studied (Warnecke, 1995). We have developed powerful solutions to change structures and processes but we have failed to address the cultural dimensions.

Now as we enter the knowledge era the challenge is back. This time we cannot postpone the issue any longer. We are now challenged to create organizations based on cultures of trust which support the dynamic teaming of ever changing constellations of capable individuals and companies and add to the knowledge creation process (Savage, 1996).

To what extent do we have to sacrifice holy cows in order to create an environment where organizational members create new knowledge, share their knowledge and support each other? How do we lay the groundwork for trust and common sense despite the fact that the economic rat race is still with us? How do we value knowledge in the organization, and how can we create an atmosphere where established but outdated knowledge can be challenged?

How can an organization change its culture from mistrust to trust and valuing, from direct control by rewards and punishments towards self-responsibility and intrinsic control? In short, how can we support major cultural shifts?

Back when the industrial era was just beginning, there was a struggle as to how best to deal with complexity. It was decided that the best way was to break complex processes into little bits. Adam Smith's pin-making factory is the prototype example of this line of thinking. Although one or two individuals might understand the whole process, those in the little boxes, and there were 18 boxes in Smith's model, knew only their little bit of the process.

Now as we move more to a teaming environment, people are expected to come together to solve a problem or seize an opportunity. If they do not understand the larger business *context*, they will likely suboptimize from their limited perspective and miss the mark.

It used to be the top management group that kept the corporate strategy very close to their chests. This approach makes it difficult for those at lower hierarchical levels in the organization to understand the context and business background of their actions. How can we change this? Could we learn some valuable lessons from the work on holonic management being developed by the world-wide Intelligent Manufacturing System project, or the fractal factory work of Professor Hans-Juergen Warnecke of the Fraunhofer Institute in Germany?

To be sure, in a climate of distrust, it was best to say as little as possible, but in a dynamic and ever changing business environment, internal openness becomes a necessity. This means new strategies are