

Forewords

Interactions between organizational performance and information technology create dynamics over time. Some of these dynamics are counterintuitive and surprising to management. Some of these dynamics have a spiraling effect of information technology that can cause not only exponential growth and prosperity, but also decline and collapse. Understanding the dynamics is essential to successful information technology management.

In my own research, I have found several factors in the work practice that can cause new information systems to fail rather than succeed. One factor is territory guarding between different value areas and between operational organization structures. Another factor is legal obstacles. Territory guarding between different initiatives for organizational development in combination with legal obstacles is also decreasing the possibility to develop information technology systems that are useful to the workplace. Instead of implemented IT systems, development work has often resulted in visions on paper.

According to the sociotechnical tradition, system development should not only be focused on the technology but also take into account organizational and human needs. It is important that information technology affects the work place in such a way that it will contribute to a thought-through and planned development of the work practice. System and work practice must be studied together.

Toward the end of this book, dynamics of police investigation performance is presented as an example of organizational dynamics. Decisions made by the police are often based on information from IT systems. My research shows that important work practice knowledge is filtered out by the IT systems. Information technology people usually have a great influence on the deci-

sions taken concerning the development of IT systems, which means that there often is much focus on technical questions. The technical demands, rather than the core activity, form the central issues.

This is what makes this book so important. Only by increased insight into the use of information technology in supporting organizational activity over time will management be able to make smarter decisions. Understanding how executives themselves influence and are part of the dynamics will further enhance the chances of success.

From action research it becomes clear that conflicts easily arise among employees who have a floor perspective and those who have a managerial perspective. Employees who have a floor perspective must dare to get into conflicts with management. In a large number of interviews that were carried out throughout Sweden, police officers pointed out factors that are negative influences on their working performance. Based on these interviews I compiled a list over the mentioned factors and divided them into nine categories. The first category was discontent of present management—the way the organization is run and work practice follow-ups.

Management has a lot to learn from this book, to avoid IT systems contributing to a counterproductive work practice, and to enable information technology to create successful business dynamics.

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In this book, Petter Gottschalk gives a rich analysis and description of the role of IT in business dynamics, derived from both his wealth of experience as an IT and corporate executive in several organizations as well as his academic research and teaching position, which enable reflection on and the incorporation of current scientific insights in the field.

The book attempts to give answers to questions such as what makes information technology management successful in business, how one can avoid failures of the application of IT in business, and how can we apply systems methodology, and more specifically system dynamics, in the understanding of such issues.

The book examines step-by-step, logically and exhaustively, a wide variety of relevant processes and elements that are put in a strategic, systems, and

governance perspective. However, not only an exhaustive analysis is made. Without an integrating approach it is hardly comprehensible to grasp the elements and their interactions in such a way that the reader is able to apply those in his own management or business environment. It is here that Petter Gottschalk has introduced a systems approach, which interlinks these elements.

A red thread through the book is the concept of systems thinking, whereby simultaneous stimuli and processes unroll and show certain different behaviors depending on the system structure and the role of IT in the management of organizations. This integrative and descriptive systems approach proclaims a novel way to management sciences in information technology applied in business dynamics. Business dynamics in information technology can now be seen as one of the major fields of the application of system dynamics.

System dynamics is used as a methodology for analyzing, describing, and understanding systems behavior, and the book succeeds in classifying different settings that cause different outcomes, explaining the role of stakeholders in obtaining more successful outcomes and survival strategies of businesses. The different facets and dynamic interactions described in this book are extremely useful for management information professionals, general management and business schools, and universities that teach information technology-related management sciences and skills.

System dynamics was founded in the early 1960s by Jay W. Forrester of the MIT Sloan School of Management, with the establishment of the MIT System Dynamics Group, which is still leading in the field. At that time, he began applying what he had learned about technical systems to everyday kinds of systems, such as several societal systems. The difference to other approaches of studying complex systems is the use of feedback loops and conceptual tools, which assist in the final formal mathematical modeling. Since then, system dynamics has been applied for the purpose of understanding the behavior of complex systems in disciplines such as demographics, environmental sciences, and economics. Although the book does not explain the actual formal mathematical modeling, it gives a valuable step up for the first phases one has to go through before the actual mathematical modeling for making simulations and studying behavior, robustness, tactics, and the like.

I take this opportunity to share some of my own experience. From the year at the System Dynamics Group at Dartmouth College in the U.S., where I had the pleasure to work with Petter Gottschalk on several projects in which system dynamics was applied, I remember the discussions we had with one of the prominent advocates of system dynamics, Dana Meadows, who sadly has passed away. At that time, the late seventies, the implications of the introduction of information technology in society was hardly felt or understood. However, we developed a strong notion that IT would have a tremendous impact on society and would lead to trend shifts that were hard to predict. At that time, mainly linear models and regression techniques were *en vogue*. With the compilation of this book, I am delighted to see how much technology and systems understanding have been developed since then.

The book represents another milestone in the application of system dynamics in such an important and relatively new field as business dynamics in information technology. Although I have been involved in the scientific research and application of system dynamics only a short period of time, and my professional focus has moved into business development of high-tech companies and research projects in life sciences, I still feel the richness of the system dynamics experience, which I still apply in my profession in basically the same way as described in this book—namely, in terms of causal loops and reference modes.

Though not mainly in information technology, I do frequently apply system dynamics thinking in the identification, selection, and development of new technologies that are suitable for further development into high-tech business enterprises. My work concerns combinations of various high-quality technologies that lead to solutions for which market demand exists. In my consulting and business development work I find that the complexity of factors and their interactions play a role that is nicely suited for system dynamics modeling.

With the step-by-step and comprehensive approach presented in this book and the cases that illustrate the systems approach, I recommend the book for information technology managers, researchers, policy makers, and system dynamics professionals alike.

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