## **Preface**

Innovation is subtle, complex, and full of surprises. It depends on organizational culture and practice as much as on individual brilliance. This book is for people who are interested in innovation and especially in breakthroughs. It explains how leading companies succeed repeatedly in inventing the future.

Open innovation refers to strategies that companies use to acquire technologies from other companies and to market their own technologies. Open innovation makes good economic sense. However, it is only half of the story. Nobody ever created a breakthrough with open innovation. Open invention refers to strategies for creating inventions and breakthroughs. The challenges of the new century require strategies for both open innovation and open invention. Without a culture of innovation that honors the pursuit of breakthroughs, the tendency is to optimize the routine, to pursue incremental improvements, and to resist the truly innovative.

This book is a road map to the ways of invention and innovation. It introduces the terminology and the practices of leading inventors, entrepreneurs, and managers in innovative organizations. Among its goals are to illuminate how innovation works and how breakthroughs are created.

The chapters in part I introduce two questions that must be answered for every successful innovation: What is possible? What is needed?

The chapters in part II focus on invention and on the experiences of creative researchers and inventors at work. Without invention, there can be no innovation. These chapters address the following questions: Do all inventors work the same way? Do researchers work alone, or in teams? What makes breakthrough inventions different from incremental product improvements? What does an "Aha!" feel like? How do repeat

inventors foster the conditions under which the best ideas arise? What educational practices foster invention and innovation?

Part III focuses on organizations and on the fostering of innovation. Innovation involves more than lone inventors and engineering teams. The full story of innovation takes place in the innovation ecology, which includes inventors, entrepreneurs, research managers, venture capitalists, universities, and government funding managers. The chapters in this part address the challenges and opportunities for innovation in the new century, asking these questions: What makes radical innovation so difficult? What matters in creating and managing a great research group? In managing research, why do some institutions use a patron model and others a client model? How are the scientific and business practices for innovation changing, and what is their future? How will business strategies for innovation change in the new century? What are the emerging strategies for both open innovation and open invention?

Our approach was to ask people for their stories. We interviewed inventors and others directly engaged in the innovation ecology. We focused on *repeat* inventors and managers rather than on individuals who had only one invention or who had stopped inventing. About half of the stories come from PARC (formerly Xerox PARC). The stories—about research cultures, business cycles, obstacles to radical innovation, and so on—are organized thematically.

We brought different perspectives to the writing. Mark Stefik is an inventor and a research fellow at PARC, where he directs the Information Sciences and Technologies Laboratory. He brought the questions and perspectives of research. Barbara Stefik has a doctorate in transpersonal psychology and is in private practice. She brought a questioning mind, an awareness of the mystery in creativity, and a practice of delving for the essence of experiences.