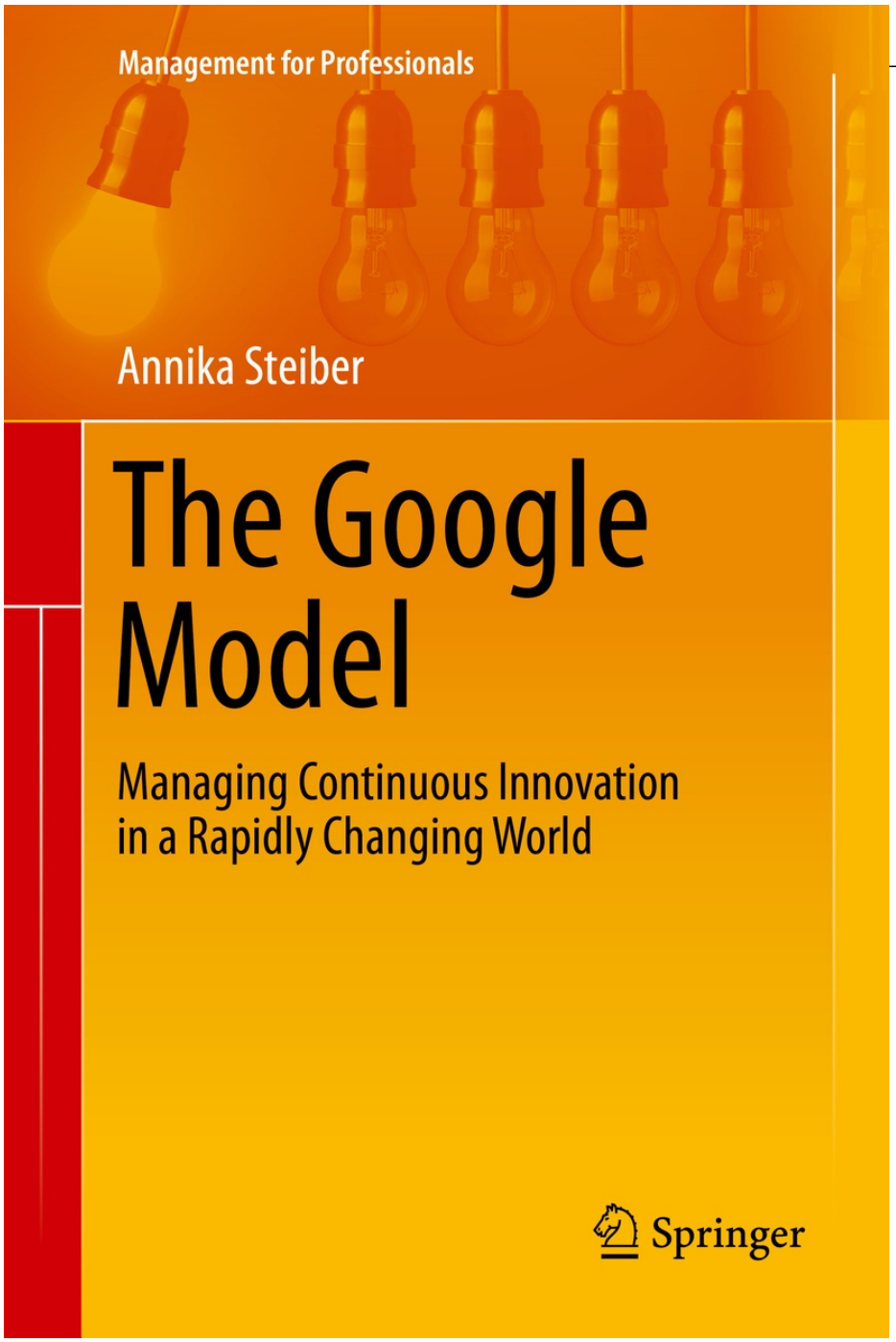
Management for Professionals
Annika Steiber
The Google Model
Managing Continuous Innovation in a Rapidly Changing World
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The Google Model

Managing Continuous Innovation in a Rapidly Changing World

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Foreword

Most companies face significant challenges in terms of innovation. The products and services that generate current income must be continually replaced by new and improved offerings to customers. The advantage that many companies have in terms of skilled labor and a strong market position is about to disappear, as other nations, after radically increased investments in education and research, are emerging not only as efficient goods producers but also as new centers of knowledge and Innovation.

What has seldom been emphasized in the literature on innovation is the radical change in leadership and management necessary to create more favorable organizational conditions for innovation. The bulk of the literature on innovation management is still based on a very traditional view of how businesses are organized, measured, and controlled, despite the fact that it is the employees' knowledge and creativity that is their most important strategic resource.

To significantly strengthen the capacity for innovation, it is necessary to take into account the increased reliance on employees' creative abilities and be prepared to challenge conventional management and organization models. This means a shift in emphasis from setting specific goals, giving precise directives and accurately measuring performance, on one hand, to setting the overall orientation, creating favorable conditions for greater experimentation and learning, and motivating employees by offering challenges and more stimulating tasks.

The purpose of this book is to illustrate and exemplify how management issues are relevant to companies and their ability to innovate. Based on the studies conducted at Google, we wish to illustrate how organizational conditions for innovation can be built into a company. Our aim is to inspire other companies to develop their own unique management models for supporting creativity and innovation.

An important part of VINNOVA's overall mission is to promote sustainable growth by improving favorable conditions for innovation. This mission includes not only funding research and innovation but also promoting the commercialization and utilization of the results. In light of this, we hope this book can become a building block in the creation of a more innovative economy. Finally, we would like to thank everyone who contributed in various ways to the realization of this book, especially the author and Google.

Klara Adolphso
Carl Ridd
Stockhol
February, 20

Preface

The environment surrounding companies and organizations is changing with increasing speed, as we find ourselves in an ever more globalized world characterized by rapid technological development. This world requires companies to change the ways they manage and organize their businesses. Certai researchers maintain that a paradigm shift is needed in management: a new kind of management for the Information Age—or as SRI International, a research institute in Silicon Valley, calls it, the "innovation economy." This new paradigm differs from management for the industrial age, which wa largely based on planning and control and on management models that were developed in the early and mid-twentieth century, a time when our world looked very different from its present state.

Management innovations are a subject that has fascinated me since the beginning of the 1990s. M interest was quickly piqued when I realized that researchers and practitioners had not devoted the same degree of attention to management innovations as they had to technological ones, despite the fact that research findings indicate that management innovations are of great importance for the competitiveness of companies and organizations. In 1993, therefore, I chose to specialize in management innovations in an effort to increase managers' and scholars' knowledge and understanding of this type of innovation. Parallel to this, I worked in leading positions in the busines sector where I developed new ways to manage and organize companies in order to promote growth. This gave me the opportunity to use my own experience to understand what kind of influence this typ of innovation could have on competitiveness and market growth.

In the 1990s, I studied management innovations such as Total Quality Management (TQM), Toyota Production System (TPS), and Lean Production (Lean). These had already garnered global attention as a result of Toyota's successes, and Toyota had become a model for many companies and organizations. At the same time when I was conducting research in Sweden about quality and productivity models, a completely different type of research was going on in Silicon Valley, the world's Mecca for Internet and Internet-based entrepreneurship. This research focused not on Toyota's management model but, rather, on understanding how certain companies become better tha others at competing in rapidly changing industries.

Around 2006, without yet knowing about the research in Silicon Valley, I began asking myself whether more continuous innovative capabilities require a different type of leadership and organization, compared to management oriented toward increasing productivity and quality, which TQM, TPS, and Lean are most known for. Could it be that there are other management models that ar just as appropriate for increasing innovative strength as TQM, TPS, and Lean are for increasing productivity and quality?

At the time when I was first becoming interested in this issue, well-established researchers, many of whom have received global recognition, began spreading the message that society has changed so much since the days of the industrial age that our methods of managing and organizing companies an organizations must also undergo a paradigm shift. New management methods must prepare these companies to change quickly and to innovate continuously with respect to both their business models and their management models. In this rapidly changing world, the concept of innovation has thus moved from first having been primarily associated with products and production to now including entire organizations' capability for *constant* change to meet the continuous external changes.

My intention in writing this book is to contribute to the discussion and development of the next generation's management for a rapidly changing world. But my intent is less modest than this. I wish to supply my readers, whether they are managers, union representatives, or public officials, with a useful management concept for continuous innovation. This concept includes six management

principles, which could be viewed as a set of orthodoxies that a management team uses to design its management model, and a number of practical applications related to how leadership, organizational structure, recruitment, and so on can be designed based on these principles, thus contributing to the company's continuous innovation. I also describe five general steps, or stages, in the change process that every company goes through when it undertakes and then implements an organizational change. believe that increased awareness of the stages that a company normally faces during an organizationa change can lead to a faster and more successful change process. I also communicate experiences fron the work of consultants in creating increased innovative capabilities at companies.

My contribution to the discussion of management in a rapidly changing world is based on the research findings from studies of successful companies in fast-changing industries, on my own findings from a 1-year study of Google from the inside, and on conclusions from my other research about the diffusion of management innovations, as well as on insights from a leading consulting company in the field of managing for continuous innovation.

At this point, I would like to express my gratitude to the friends and colleagues who have made this book possible. I thank VINNOVA and the research Institute for Management of Innovation and Technology (IMIT) for choosing to finance my work on this book. Sverker Alänge, who has been my research colleague and friend for 20 years, and whom I have collaborated with on issues of innovatio management, took part in the study of Google and has provided me with a great deal of support. I als want to thank Lars Wiberg, who helped me not only to write this book but also to complement my ov knowledge with new one.

Naturally, I also appreciate all the help given to me by Google, Inc., and I am grateful to all the executives, managers, and employees who agreed to be interviewed. I thank Kathleen Eisenhardt at Stanford University, AnnaLee Saxenian and Henry Chesbrough at the Berkeley University of California, Curt Carlson at SRI International, Patrick Cook at PARC, a Xerox company, Gabriel Baldinucci at Singularity University, and Gary Getz at Strategos, Inc., all of whom shared their thoughts and experiences in the area of innovation with me.

Last but not least, I would like to thank Larry Abramson for excellent translation of the manuscript, and my husband, children, and parents, who have encouraged and supported me in my continued research and who have stood behind me, literally and figuratively, during my many hours a the desk.

Annika Steib

Stockhol

February, 20

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1. Introduction

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Abstract

The average lifespan of a multinational company is about half that of a natural person. While human life expectancy is growing, however, owing to improved healthcare and better living conditions, the lifespan of companies is getting shorter. This does not have to be the case.
The average lifespan of a multinational company is about half that of a natural person. While human life expectancy is growing, however, owing to improved healthcare and better living conditions, the lifespan of companies is getting shorter. This does not have to be the case.

This book is meant as a source of inspiration guiding management, unions, and public officials in providing companies with the conditions they need to have longer and healthier lives in our increasingly fast-changing world. We know with a high degree of certainty that the primary reason why large and previously enviable companies lose steam and finally die is that they are not able to keep pace with the rapid development that is now largely exponential rather than linear. For many executives today, the strategic issue they face is *not* whether they can change their processes and become more productive but *rather* whether they can continuously innovate with regard to their business and management models,[1] even with regard to industry-wide models. In a rapidly changing world, a company's business and management model may perhaps remain competitive for a few years in contrast to a more static world in which business and management models lasted for perhaps 10 years or more.[2] Despite this, although most companies have some type of research and development (R&D) forum for technical innovations, few companies today have internal forums in which business and management innovations are developed. One consequence of this is that many companies face the situation reactively and do not question their business and management models until external demands, such as new market and owner requirements, force them to do so. This book will present and discuss ideas based on my research into successful companies in rapidly changing industries regarding how these organizations can create continuous innovative energy *without* the presence of a major crisis.

1.1 Those Who Cannot Remember the Past…

… are condemned to repeat it. (George Santayana)

Modern humans first appeared on Earth 50,000 years ago and began to practice agriculture 40,000 years later. The next major change occurred with the advent of the steam engine 250 years ago. During most of human history, people were unaware of changes in their surroundings, as the pace of these

changes was so slow that members of every new generation lived in much the same way their parents had. This is the way it was for much of recorded history, but things are very different now. Our experience becomes worth less and less with each passing year.

1.2 If the Rate of Change on the Outside Exceeds the Rate of Change on the Inside,

… the end is near." (Jack Welch, CEO of General Electric in the 1990s)

Most adults realize that the rate of change in society is increasing. Many phenomena are developing exponentially and are following an ever-steeper S-curve. CO_2 emissions, Internet connections, the total amount of stored information, mobile telephones, e-book readers, PCs connected to the Internet, and a great deal more are developing in this manner. This means that we ar living in a completely different world from that which our ancestors inhabited about 100 years ago, when almost nothing was developing exponentially. The rate of global and external changes is accelerating, and nothing we are aware of indicates that this acceleration will abate.

Companies now exist in a competitive situation that is completely different from that which prevailed only a few decades ago. At that time, large companies were shielded by patent protection and various types of barriers to entry. A high degree of skill and expertise also contributed to reduced competition. This is no longer the case. Knowledge is accessible to most people, and creative companies and business clusters are discovering new ways to satisfy both existing and new needs.

The best way we know of dealing with this situation is to be very good at innovating.

Many companies have already disappeared, while others are implementing one cost-cutting program after another and are working with downsizing and outsourcing in order to retain their place in the market. The older a company is, the more difficulty it appears to encounter adapting its busine to external changes.[3] It should not come as a surprise that many companies face problems as a result of the rate of change. Some, however, are managing quite successfully.

1.3 But There Are Companies That Have Succeeded…

3M, Procter & Gamble, and Toyota are examples of companies that have been considered pioneers and have served as role models, and these are not the only ones. From the early 1980s, an abundance of literature has addressed the secrets of the success of these vigorous companies.[4] Business schools, institutes of technology, consulting firms, and standardization and trade organizations have utilized these new research findings and packaged them as management concepts, training programs, and change processes that can be adapted to serve companies in various industries.

For several reasons, however, these measures have been so inadequate as to prove almost futile. First of all, they enable a company to update only by using measures that were successfully used a fe years earlier. These approaches may not work as well, or at all, in today's situation with its faster rat of change. Second, executives have been recognized and acknowledged for what they accomplished earlier in their careers. As a result, they often hold to the experiences that led to good results, even though those experiences may no longer apply to the situation at hand. Outdated experience can even be fatal to a company.

1.4 A Look in the Rearview Mirror

During the past 100 years, Western nations have been transformed from agrarian societies in which a large part of the population lived in rural areas—first to industrial societies with densely populated areas largely inhabited by persons with little education, and now to service and information societies or as some call it innovation societies, with ever larger cities and ever greater demands for highly educated employees. In response, companies have developed new forms of organization and leadership, from Taylor-style specialization for relatively simple tasks to demands for more cognitiv understanding, greater ability to handle more complex duties, and the capability to quickly make decisions. Until the end of the 1990s, we managed quite well with gradual changes in the context of a generally unchanged conceptual paradigm, an intellectual model inspired by early physics. While external changes were taking place at that time, as well, they were relatively tame compared to what we are facing today. Early physics, prior to Einstein and Bohr, focused on describing actions and reactions, causes and effects—in other words, it dealt with linear development.

Today our companies face challenges at least equal in magnitude to those the Western nations faced about 200 years ago, when they took the giant step from an agrarian society to an industrial one A different mode of thinking therefore was needed in order to meet present and future needs. This ne paradigm is inspired by biology—more particularly, by the ways organisms adapt to changes in their living environment in terms of both structure and behavior. *Evolution is the basis for this new intellectual model*. Evolution develops through dynamic adaptation. According to Stuart Kauffman,[5] leading researcher in this area, "Whether we are talking about organisms or economics, surprisingly, general laws govern adaptive processes." Nobel Prize laureate Kenneth Arrow observed that: "if you can figure out how adaptation is embedded in biological systems, and then broaden this knowledge into a theory of general evaluation, you can effectively apply the theory to many complex systems—including business." This alternative way of thinking is called *systems thinking*.

1.5 Management and Organization Are Continuously Changing

When the basis of a society's economy changes, we also need to change the way businesses are organized and managed. Although this appears obvious, innovations in management have not been accorded the attention given to technical innovations. This holds true both in business and among innovation researchers and is somewhat inexplicable, considering the tremendous importance of management innovations for a company's competitiveness. The American giants Du Pont and Genera Motors (GM) introduced the multidivisional form (M-form) back in the 1920s, and this management innovation was soon adopted by others. Alfred P. Sloan, who was the CEO of GM, first implemented radical centralization of a sprawling collection of automobile factories and subsequently organized them into divisions possessing a large degree of autonomy. This is considered one reason why GM became the largest company in the world several years after World War II. In the 1990s, Peter Drucker characterized GM as the most successful company in world history, with reported profits for 70 consecutive years.[6] Du Pont was viewed as a similar business icon in a different industry.

1.6 … But Change Spreads Slowly

Changes in society and economic development thus create a need for new ways to organize and lead a business; in other words, there is a need for management innovations. These often arise in some visionary company, such as DuPont and GM were during their glory days. But despite the success of these companies, the idea of divisionalization did not spread to the vast majority of Fortune 1,000 American companies until the 1960s, 40 years later.

This is one of many examples showing that despite great success, it takes a long time for other companies to implement management innovations. A second example is total quality control (TQC), which stemmed from ideas about applying statistical methods to quality control that were expressed from the 1930s to the 1950s. Over time, TQC developed into a management concept based on principles to achieve low cost and high quality *at the same time*, and was introduced by A.V. Feigenbaum in his book, *Total Quality Control*, published in 1951. In the 1980s, quality management experienced a major breakthrough, in part owing to the Malcolm Baldrige National Quality Award in the United States and the spread of ISO 9000. This came in 1987, many years after the concept was first introduced. Three years later, the Swedish quality prize, Utmärkelsen svensk kvalitet (USK), wa first awarded in conjunction with the establishment of the Swedish Institute for Quality (SIQ). USK was the Swedish answer to the Malcolm Baldrige National Quality Award.

Toyota's production concept, Lean Manufacturing, is now making headway among Swedish companies—*after 23 years*. Lean Manufacturing was introduced in 1988 by John Krafcik in "Triump of the Lean Production System," an article based on his master's thesis at MIT's Sloan School of Management. This was followed in 1990 by a book entitled[7] *The Machine that Changed the World*: *The Story of Lean Production*.

Attention garnered by awards is not the only explanation why TQM, Lean, and other management concepts gain widespread adoption. There is also the fact that innovation in management, whether divisionalization, TQM, or Lean, can be packaged and communicated in a way that makes it possible to discuss and introduce them in other companies. In this context, researchers and consultants often play an important role. They identify and shepherd these ideas, packaging them as concepts that they then label. This allows these ideas to be introduced into an organization and implemented. The management innovations become more widely adopted, but this takes a long time, often several decades.

1.7 Google, a Management Model for a Rapidly Changing World

Google may well be the present day counterpart to GM in the 1920s and Toyota in the 1980s and 1990s with regard to management innovation. Google was founded in 1998 by two Stanford Universi students. In 2012, only 14 years after its establishment, Google had already been distinguished as one of the world's most valuable brands for 5 years running, according to BrandFinance Global 500. The same year, Google reported sales of 50 billion dollars and almost 11 billion dollars in gross profits. Today, Google is considered one of the world's most innovative companies.

Since the late 1990s, parallel to but independent of Google's growth, several leading researchers have studied companies in rapidly changing industries in order to identify factors that contribute to long-term competitiveness in uncertain and volatile surroundings. Reviewing their conclusions, I found a pattern consisting of *six management principles*, which I will describe in Part I: Management Principles for Continuous Innovation.

In my study of what drives innovation at Google, I found indications that the company's management model is based on these six management principles for continuous innovation. This represented a major 'aha' experience for me and served as my most important motivation for writing this book.

At present, there is no well-known management concept that addresses *management for continuo innovation*, something that is necessary in a fast-changing world. My hypothesis is that Google has developed a management model based on the six management principles identified as crucial for lon term competitiveness in a rapidly changing world. As a result, Google's management model can serv as a source of inspiration for the management teams of other companies and organizations that today

may be contemplating how they can develop their operations to promote long-term sustainable success.

Summary

Management innovations develop in tandem with technical innovations. Management innovations often arise in a company, inspired by both in-house ideas and outside influences. In order to reach other companies, the knowledge and experience of management innovation need to be packaged appropriately. Frequently, researchers and consultants or the company itself assumes the task of packaging the innovation as a management concept. It often takes considerable time to develop a management innovation within a given company, particularly when it relates to large parts of the company and its operations. Additional time is then required for the innovation to spread as a management concept so that other companies can learn and apply it to their own situations. The circulation can progress faster if there is support of some sort, such as the Malcolm Baldrige National Quality Award.

No management concept currently addresses management for continuous innovation. Google appears to have built up a very successful business through a management model that uses the principles researchers have identified as organizational characteristics promoting long-term competitiveness. As a result, Google's experiences can be useful to other companies in a manner that recalls the wider usefulness of the management innovations implemented at GM and Toyota during those companies' most innovative periods.

1.8 Organization of This Book

1.8.1 Part I: A New Set of Management Principles

In a new set of management principles, I provide a background to my premise, present and explain some important terms, and describe a pattern of management principles that I identified while reviewing results obtained by other researchers in studies of successful companies in fast-changing industries.

As I reviewed this research, I identified a number of shared principles even though the research in question had often been conducted in a variety of different disciplines. As far as I know, the set of principles I present in Part I has never before been described.

1.8.2 Part II: The Case of Google

In Part II, I describe Google in great detail, based on interview data from a 1-year study of Google from the inside. The documentation was collected through interviews that Sverker Alänge (Chalmers University of Technology) and I conducted with representatives of the company, as well as from on-site observations.

I conclude Part II with a description of Google's various practices and a discussion as to whether they work based on the six principles.

1.8.3 Part III: Continuous Innovation: A Critical Business Skill

What conclusions can we draw from Parts I and II? Are IT-related start-ups the only companies that can learn to use lessons derived from Google and the research I refer to? Or can conventional industrial companies, service providers such as banks and insurance companies, and perhaps even schools, healthcare institutions, and other caregivers utilize at least some of the insights and

experiences that we can obtain from Google in an effort to innovate their business and management models? In Part III, I discuss this and present a proposal for a new management concept based on the six management principles and ten practices. I also present five different stages that most companies and organizations go through in conjunction with an organizational change and, at the same time, provide some practical advice. This section also presents some final advice to governmental agencies that focus on innovation.

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Footnotes

1 I will in this book use terms such as management model, company system, and management concept. I define management mode as a simplified description of the operational model chosen by a company. This includes organizational elements such as e.g. vision and mission, leadership style, culture, structure, systems for learning, systems for performance evaluation, promotion and incentives, systems for interacting with External Surroundings and brand. As I later will suggest a systems approach, a management model can be described as a company system, including the above-mentioned organizational elements. A management concept is a set of management principles, or as I view them orthodoxies, and a set of practices, that is a recommended orientation of practical applications of the principles resulting in a specific leadership style, culture etc.

2 Hamel (2009).

3 https://www.improve-innovation.eu/wp-content/uploads/2012/09/IMP%C2%B3rove_High-value-consulting2012.pdf (p. 11).

4 Until the 1970s, R&D in the area of business management was problem: How can we find the right solution to common problems In 1982, the first solution-oriented work was published: *In Search of Excellence* by Tom Peters and Robert Waterman, consultant at McKinsey. The book proposed the theory that long-term successful companies should have a *strong* company culture. Peters and Waterman's work gave rise to many successors who modified their message. In the mid-1990s, a British researcher was commissioned by a large company to invent "a literature of success" to find out whether there was a common denominator. She found one and called it *alignment*. In this work, the common denominator is called *participation*, the individual's self-selected undertaking and commitment to a common mission.

5 Kauffman (1995).

6 As many know, GM's history of success came to a halt in the 1990s. Sweden, however, has a company that has been even more successful than GM was when Peter Drucker examined it. This engine of success is SCANIA.

7 Womack et al. (1990).

Part 1

A New Set of Management Principles

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2. Management Principles for Continuous Innovation

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Abstract

This section is about global changes—why they are bigger, come more often, and are becoming more difficult to predict. It's also about what companies have done, and are doing, in order to take advantage of the opportunities and avoid the threats embedded in these ever accelerating changes.
This section is about global changes—why they are bigger, come more often, and are becoming more difficult to predict. It's also about what companies have done, and are doing, in order to take advantage of the opportunities and avoid the threats embedded in these ever accelerating changes.

Certain changes are products of shifting technologies. One established technology is replaced by something new. We've seen this before. Steam engines were replaced by internal combustion engines and electricity, electricity grew into electronics, landlines are being replaced by mobile telephones, and newspapers and paper books are increasingly being supplied as digital files for tablets and e-book readers. These changes also affect how people live their lives. Even when they are staying home with their sick child, they are now expected to be accessible by phone and to answer your e-mail. Some experience this as a source of stress, while others find greater freedom. Most of us experience both these feelings as a result of the changes that follow in the wake of innovations.

When something new appears, whether a technological solution or a change in social norms, things generally start manageably. As the innovation gains adherents, development accelerates, and finally, when the change has become widespread, the rate of change tapers off. Subsequently, a new innovation appears, and the process begins again. We often depict this process as an S-curve. The transition between one technological curve and another is an indication of innovation. I call this a *phase transition*. When a phase transition occurs, it creates opportunities for companies that are able to innovate. For those who are not able to manage this, the phase transition signals the start of a process of decline.

Researchers who have studied such processes[1] explain that the more people or companies quickly adopt the innovation, the steeper the S-curve becomes. In addition, the greater the diversity in age, cultural affiliation, and other qualities among those who adopt the innovation, the more powerful the change is and the sooner the next phase transition will occur. Today's mobile phones with their touch screens, Wi-Fi connectivity, and capacity to stream music have little in common with the rather clumsy mobile phones first launched a few decades ago. Mobile telephony is an example of a technology that has changed people's lives in a multitude of ways in so many places around the globe.

The pace of external changes is accelerating as ever-larger groups of people and companies adopt advances in ever-shorter spans of time *and* as the diversity among those adopting these advances grows. This means that the S-curves become steeper, and the life cycles of technical solutions and ne

products become shorter. As a result of this shift, larger numbers of companies are required to handl
continuous innovation, an ability that also demands speed and scalability.

2.1 Continuous Innovation

Innovation is a broader concept than R&D. Innovations affect every part of a company. 'The Organisation for Economic Co-operation and Development' (OECD) describes four types of innovations[2]: product innovations, process innovations, marketing innovations, and organizational innovations.

A company is *innovative* when it possesses the ability to change its business or management model, as well as to develop and implement new products that respond to expressed and unexpressed customer needs. A customer can be a company or an individual. But employees, owners, suppliers, ar the public sector can also be stakeholders that may well determine a company's success or failure. A company that is continuously innovative can manage to constantly change its business and management models and to develop new products. Companies that never fail may be refusing to take risks, and this can be a sign of limited innovation capabilities. On the other hand, the ability to learn from one's mistakes can be a sign of good Innovation Capabilities.

Continuous innovation requires a holistic approach to leadership and organization. It entails creating the basis for an innovative climate and innovative interaction between people. If we wish to increase the Innovation Capabilities of a company or other organization, we need to increase our understanding of how each part of the innovation process can be coordinated within the framework o a *company system for continuous innovation*.

As the pace of external change accelerates, the need for continuous innovation grows.

2.2 System Effects: We Don't Know Exactly What's Happening

Most of us have at some point been sitting with colleagues discussing a problem that none of the participants seems able to solve. Then someone comes up with an idea. It might not be a particularly good one, but it stimulates someone else to come up with a different idea that may still not be good enough. Finally, the group arrives at a satisfactory solution. No one is able to explain where the final idea came from, but we know now that our creative abilities are at work. The innovation is a system effect—the product of complex interplay between individuals and other components in a system, whether that system is a company, a region, or an entire country. When talking about a company, the term *company system* can be appropriate. As we cannot predict exactly how various components of a system will interact, we develop a company system through trial and error. We must be aware that things may not get things right the first time, and instead we must try various solutions and learn fro these experiences in order to better succeed at our next attempt.

When the properties of the whole are greater than the sum of the properties of its parts, system effects appear. We discover these later, but we cannot predict with accuracy just what these effects will be.

We usually distinguish between linear thinking (cause and effect) and systems thinking. Continuous innovation is based on systems thinking.

The spread of a technological or management innovation is affected by four primary factors[3]: the innovation and its characteristics—, the communication channels used, the time involved, and the social system. The social system consists of individuals and organizational units that relate to each other in an effort to realize a common objective. History, norms, and opinion leaders in the social

system are important to the process of circulating an innovation.

2.3 The Company Model of the Future: A Paradox

When a theory says one thing, and common sense based on one's own experiences says something else, the result is a *paradox*.

In order to maintain, and preferably improve, profitability, companies must decrease costs or create new income. Productivity is a measure of what we get from current resources.[4] Budgetary discipline, cost control, and constant vigilance to discover and eliminate unnecessary costs are core activities in the daily production of goods and services. At the same time, if we are to continue to compete in the future, we need to develop new products and services that provide new income.

Experience and common sense indicate that it can be very difficult to combine these two objectives—efficient production, on one hand, and the continuous creation of new value streams through innovations, on the other, in the same business. In other words, it's hard to be a penny pinche regarding costs and at the same time conduct future-centric experiments that devour resources with n guarantee that the results will create new value. Reality, however, teaches us something different. Innovative companies, such as 3M, Apple, W. L. Gore, Google, and many others have accomplished this apparently difficult, if not impossible, task. These companies have succeeded in joining various forms of logic that many see as incompatible, such as large-scale operations and flexibility, effective control and individual freedom, a focus on today's business and a commitment to the future. By their ability to combine these ostensibly incompatible forms of logic, these companies have created the conditions necessary for both productivity and innovation.

Nevertheless, when the experience of executives leads them to one conclusion and external examples indicate something different, most executives prefer to rely on their own experience. "Forced to choose between getting what we want and maintaining second order constancy, we may choose not to get what we want," Chris Argyris[5] concluded many years ago.

Research about continuous innovation seeks answers to the question not only how one innovates continuously but also how this can be done parallel to conducting and improving the daily operations (production) in a manner that will promote quality and be cost effective.

2.4 Innovation Research

An interesting insight in management and innovation research is that a company's ability to innovate is explained more by how that company is managed and organized than by its technological skill.[6] I therefore first highlight the importance of management innovations to Innovation Capabilities and continue by describing the six management principles that support and provide the necessary conditions for continuous innovation.

2.4.1 Management Innovations and Innovation Capabilities

Regardless of how good a company is at developing new products and applications, these can hardly yield any results without an environment that promotes innovations. Thus we can see that management innovations, like technological expertise, are important in generating innovations. Henr Ford's assembly line was a management innovation and provided the stimulus for a number of technological innovations. A half-century later, the semiconductor industry not only revolutionized technological development but also led to management innovations in both the private and the public sectors.

Thus, management innovations and technological innovations work in tandem in a dynamic manner, affecting each other and leading to greater effects by mutual influence than they would if only one of these was affecting the other.

Researchers have also found that the nature of a company's organization influences not only its Innovation Capabilities but also its propensity to adopt innovations from external sources.[7] We can thus see why management innovations are important for both a company's Innovation Capabilities ar its long-term sustainable success.

2.4.2 The Company System's Importance to Innovation Capabilities

A system is a collection of components with certain properties and with certain connections among the components, as well as among the characteristics of those components.[8] A company system has organizational components, and these affect one another and structure the characteristics of the system.

Organizational components include issues such as whether decision-making authority is centralized or decentralized, whether the norms allow mistakes or demand that everything be "right the first time," whether the atmosphere is formal or informal, whether information flows freely and i accessible to everyone whose work requires it or is reserved for the few, whether supervisors give orders or coach, whether cooperation between individuals and units is encouraged, and whether internal competition is the order of the day. All these characteristics of an organization constitute the company system.

There is not much research regarding the company system's importance for Innovation Capabilities. The innovation research that does exist focuses mainly on the process or project level o on individual components, such as company culture and leadership,[9] which have been studied separately. As a result, knowledge of one component of the system is often isolated from knowledge of other components. Each of these studies aims to increase understanding, within a defined area, of the significance of various characteristics within a given organization component. It can therefore be difficult to summarize the importance of the innovative abilities of all these components, working together and reinforcing each other to produce positive or negative system effects. There is thus a challenge inherent in analyzing company systems in their entirety. The system is more important for innovation than the sum of its individual parts is. The holistic approach does justice to the organic nature of Innovation Capabilities. In Part II, we will see how Google's organizational components work together dynamically to utilize and develop innovative ability.

At this point, I present a summary of the management principles seen as characterizing successfu companies in rapidly changing industries. Although these six management principles are described separately, when they are made to work together, they give rise to an ability to deliver long-term and sustainable quality and productivity in daily production, and they promote continuous innovation strength.

2.5 Six Management Principles

The following are the six management principles that various clusters of researchers have identified crucial in explaining the ability of successful companies to engage in continuous innovation:

- *Dynamic capabilities*. The company's ability to integrate, develop, and reconfigure internal and external competencies in order to meet rapidly changing surroundings.
- *A continuously changing organization*. If you delay taking action until problems arise, you will