

**Robustness**  
**Anticipatory and Adaptive Human Systems**

**Volume 4**  
*Exploring Organizational Complexity*

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**ROBUSTNESS**  
**Anticipatory and Adaptive Human Systems**

*Edited by*

MIKA AALTONEN  
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Printed in the United States of America

To my mother and father.

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**Michael S. Loescher.** During his 30 years of professional life Michael has become widely acknowledged as one of the foremost experts on government reform and strategic planning in the world. He has authored, or been contributing author to, five books on the subjects of intelligence, futures-forecasting and risk-management. He was twice selected one of the top 100 US employees, and held the first Admiral William A. Moffett Chair for Innovation in Naval Warfare at the US Naval Institute. He was a principal drafter of the present US Department of Defense Network-Centric Warfare doctrine. He is also a founding Director the Research and Analysis Corporation of Finland.

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## Preface—The Foundations

**T**ime has passed quickly. It was four years ago when I started a dialogue with my sense-making colleagues around the world; some of them experts who share the mind set of critical thinking, and some of them decision-makers in various governments and governmental organizations trying to deal with the uncertainty they face. The discussions concerned the ideas, thinking, processes, projects and institutions we use to make sense of and to build our respective futures. The aim was not to rank or compare the countries between themselves, but rather to find out if there exists conditions for a novel, more robust sense-making and decision-making theory.

A lot has happened while writing this book. At the time of writing, in the spring of 2010, all the world is reeling from a financial crisis. At the top of the economic ladder, the rich are poorer. In the middle, decades of hard work by hundreds of millions of people has been lost to a sudden financial tsunami. And at the bottom, the poor have again been pushed aside.

The credit crunch has undermined faith in our economic and investment systems and raised difficult questions for policy-makers and private individuals alike. It has undermined or destroyed the credibility of many of the foresight, planning and investment theories and the reputations of the past generation.

For us, the issue is certainly not the preservation of any status quo, whether political, economic or societal. On the contrary, we are convinced that the world is undergoing an extraordinary complex and lengthy transformation. The signs of which are everywhere to anyone who will see them. We are all going somewhere new. None of us, the most or the least able, can plot a precise course. Nor will master plans see us through; they are the first to be jettisoned in a sea of complexity. We are all going to have to invent the new world, decision by decision, action by action,

over the next several decades.

However *Robustness* is not about the horrors of the economic downturn that have appeared in almost all shapes and sizes, and have had dramatic effects upon most human activities. But *Robustness* hopes to represent a fundamental change in how sense-making and decision-making strategies can be achieved in a more conscious, responsible and sustainable way.

It seems to me that for those who participated in this research there is a consensus on the three major reasons of dissatisfaction with current dominant modes of thought and action practices. I shall state them explicitly:

Firstly, the legacy of the Western tradition of *efficient cause being the primary focus of science and economics*, is considered here erroneous and misleading. Its dominance in our thinking is also one of the reasons why many real-world problems appear intractable and are difficult to resolve. The difficulty arises when only single causes are sought, even though such problems arise from the interaction of multiple, underlying and interrelated causes.<sup>1</sup>

Secondly, our sense-making and decision-making *practices are set against an unchanging landscape*, where only a single element or few elements, if any, are extrapolated. Thus, is it any wonder that there is an inherent inability to deal with complex chains of causality and to take into consideration both top-down and bottom-up causes.

Thirdly, *the classical idea of a fixed, permanent and absolute, which is simultaneously an acontextual truth*, should be replaced with a spatio-temporal approach. This ought to be done because the explicit consideration of a spatio-temporal context will necessitate new ways of understanding epistemology, methodology and leadership and help produce better futures.

The theory emerging in this book has arisen in response to the limitations of our present modes of thinking. We hope we have a theory that builds a better understand-

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1. C.f. Kaminska-Labbe & McKelvey 2006.

ing of the emerging landscape, and recognizes that there are multiple emerging cause and effect relationships on different levels. Furthermore, we emphasize the relevance of spatio-temporal context, which will be necessary in order to create more and better anticipatory and adaptive human systems.

For this research, a multiple case study approach<sup>2</sup> and in-depth thematic interviews<sup>3</sup> by individuals and groups were employed to investigate our ideas, thinking, processes, projects and institutions we use to make sense of and to build our futures.

Hundreds of people were interviewed. The interviews typically opened with a brief presentation of the research, after which the interviewees were guided by open-ended questions that were complemented by more specific ones. At the end interviewees were asked to name further contacts that could potentially be helpful in providing a deeper understanding of the research topics.

In addition to the interviews and confidential discussions, secondary documents and sources were consulted. These included a wide variety of material, from various relevant organizations to specific projects; some discussions merely pointed us in the direction of information contained in reports, news services and websites.

It would be naïve to believe that a theory could emerge solely from data. In every theory building research there is always a previously existing body of knowledge, and to claim ignorance of such existing literature will not benefit any research, vice versa it disguises the biases. This research builds on sense-making, decision-making, operational analysis, anticipation, foresight, prospective thinking and futures studies literature.

The results were achieved after iterating between the data, the relevant literature, and emerging ideas and

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2. Eisenhardt 1989, Yin 1994.

3. Strauss & Corbin 1998.

constructs<sup>4</sup>. This process of iteration was repeated several times with different cases and people; in the end the new theory found its shape and form.

### **Discussing the Key Concepts**

According to the Aristotelian idea of science, there are many different sciences and they are characterized according to their specific types of objects and their laws: physics is the field of natural movements and transformations; logic is the study of formal reasoning; politics is the analysis of public virtues; and rhetorics is the study of how to convince others<sup>5</sup>.

Implicitly, Aristotle sets the basis for polynomial understanding of the world. By which I refer that certain names, terms, ideas and theories are supposed to work best, and sometimes only, within certain areas of, expertise and science, or certain professions.

Three questions arose from consideration of our polynomial understanding of the world: what is the nature of each science, what are the mutual connections and dependencies between the sciences; and what is the nature of the whole emerging from them.

To summarize briefly the long and colorful debates that have taken place in the science throughout the centuries, and to provide satisfactory answers that can be categorized and subsumed under distinguishable categories, i.e. to make ontological universals, we could claim that three positions can be identified in today's world: nominalism, conceptualism and realism. According to nominalists universals are linguistics expressions; to conceptualists universals result from our cognitive capabilities to conceptualize and categorize our experiences; and to realists universals exist independently of all forms of concrete existence.<sup>6</sup>

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4. Miles & Huberman 1994.

5. Poli 2006.

6. Poli 2006.

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	<b>Ontological universals</b>		
	<b>Linguistic expressions</b>	<b>Concepts</b>	<b>Objects</b>
Nominalism	Yes	No	No
Conceptualism	Yes	Yes	No
Realism	Yes	Yes	Yes

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**Table 1** *A summary of ontological universals*

One could say that nominalists only accept universal expressions, while conceptualists accept both universal expressions and universal concepts, and realists accept universal expressions, universal concepts and universal objects.<sup>7</sup>

For this research the previous categorization serves as a building block. It explicates elements that any serious new theory should be able to deal with. And indeed, after reconsidering the importance of time, living entities, and the spatio-temporal contexts in which we are engaged, we are able to evolve even some of the oldest ideas and most long-standing Western thinking.

There is an agreement that time is an essential element is social life and that it should be central to social theory, but most of the social theories are atemporal. In fact, the Newtonian description of change, and the approaches based on that, deal with non-temporal quantities without the need for a temporal context.

Most people assume that they share the same time-frame as other people. However, we often fail to recognize that time is considered in different ways by different people and is understood in different ways within a variety of contexts, for example, events, roles and organizations. Different things have different natural time scales. By matching the phenomena with their natural time scale the possibility to create more sensitivity regarding continuity and discontinuity is revealed. Thus, significant possibilities for chang-

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7. Poli 2006.

es and interdependent events appear where previously we had assumed none.

We can find time in the life processes of growth; mechanical, biological and social interactions; natural and social rhythms; but also in identities, memories and social histories. An explicit focus on time reveals new ways of understanding and a different use of existing concepts<sup>8</sup>. Even the presentation of ontological universals in Table 1 has had to be reassessed and some of our longheld beliefs become invalidated, when time is given a focal role in our approach.

A significant question with huge practical implications for any anticipatory and adaptive human system is: Where is the future? If we think the future is somewhere out there, further in time and space, waiting for us in one form or another, we will have difficulties in taking the responsibility for it. If we place the future in our present decisions and actions then it is likely that more conscious, responsible and potentially sustainable solutions become achievable.

The second significant question concerns the way we comprehend the past, and in particular, how past events turn into a causal force that influence and determine our present and future social realities through communication, conceptualization and memory.

Here, the approach taken to *time is multileveled*, we understand time as “dendrochronology”, literally the dating of annual tree rings, according to which the levels of history and the different conceptions of futures are to be seen in the presence, and whether we refer to individuals, organizations or even nations our ideas of pasts as well as our conceptions of futures influence our ability to adapt with changing situations.

Traditionally human beings have used the concepts of past, present and future to make sense of their lives and to be able to comprehend it as continuum. In Table 2, I take

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8. Adam 1990.

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		Future future
	Present future	Future present
Past future	Present present	Future past
Past present	Present past	
Past past		

---

**Table 2** *The present present*

St. Augustine’s<sup>9</sup> considerations further. He concludes that the past and the future do not exist outside the mind, and argues that “the mind performs three functions; those of expectation, attention and memory. The future which it expects, passes through the present, to which it attends, is not the past which it remembers.” The understanding of past, present and future as present past, present present and present future in the middle column is complemented in the left hand column by past past, past present and past future, and on the right by future past, future present and future future. Table 2 provides an explicit notional tool to discuss how the past future has moved to the present present, and how the present future will become the future present. If we want that the future present will be different from the present future, we need to have the elements that build a different future into it because continuing the way we always have makes the future predictable.

The second fundamental issue concerns *the nature of the living entities*—human beings, organisms, ecosystems and organizations are only ever partially determined and always partially open. The previous sentence applies to everyone and explicates our philosophy in *Robustness*. There is potentiality, even if hidden, which means that the potentiality is there, but waiting for a trigger to activate it, or latent, meaning elements that may not exist in the entity’s current state, but which may emerge in time. For instance, a newborn baby cannot do most of the things adults

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9. St. Augustine Book XI, quoted in Jaques 1982.

can, but in due time he will have the capacities to do them.<sup>10</sup> This necessitates a new approach to change, we cannot anymore comprehend and treat it like billiard balls in motion nor on the behavior of dead matter<sup>11</sup>.

We are engaged in *spatio-temporal contexts*, our lives at home and in work happen within specific space-time environments. In everyday life these contexts are pretty far taken-for-granted. However, when our ontological framework becomes richer, it becomes more robust, and more anticipatory and adaptive. A richer framework enables us to see what we did not see before, and helps us to attain our hidden and latent potentialities, and benefit from the changes that take place in our environment.

Recent human history shows a preference for order and gradually we have come to the belief that order is or should be the basic state of affairs in our lives. Newtonian physics pervades our lives. Whenever we interact with a machine we interact with Newtonian physics in practice<sup>12</sup>. Using clocks, driving cars or having factories building them would be impossible without the knowledge of the physical principles involved and the full application of efficient cause. Nevertheless, we perceive physics not as a way of understanding but as being the fundamental reality of our existence.

Chemistry Nobel Prize Winner Ilya Prigogine would claim, human beings are dissipative beings and function “far from equilibrium”. Sometimes our lives are in order and proceed linearly “as planned”; but sometimes we find ourselves in chaos, where the order is undone. It is probably likely that we are most often somewhere in between these states, in other words, we exist in a complex state. If we rethink and develop sensivity to the spatial contexts we work within, our behavior will begin to impact on its environment, because some interventions work best in linear

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10. Poli 2009b.

11. Adam 1990.

12. Adam 1990.

contexts, some in disruptive ones, and some are appropriate interventions for complex contexts.

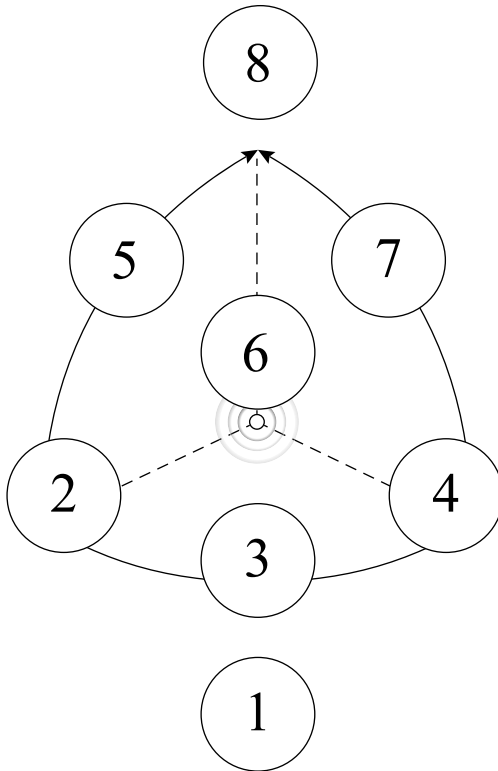
Naturally our approach is *polynomial*, but it is not organized according to professions, fields or sciences like in Aristotle's approach, but according to spatio-temporal contexts. I would like to argue that people use and are aware of various ontological, i.e. spatio-temporal, contexts and they have created specific terms, knowledge and approaches within them implicitly, and furthermore this book is the first one that explicitly brings them together into a coherent theory. The use of names, terms, concepts and theories is explicitly motivated in *Robustness*.

### Chapter by Chapter Outline

The framework according to which also the chapters are organized represents the ontological basis in which the chapters best present relevant, insightful and contemporary observations. I claim that the framework is durable in time, and helpful in various contexts over and over again, because it captures something essential about our existence as human beings, because it is first of all an ontological framework, not a methodological or epistemological one.

Our employment of time and space reveals opportunities for changes, where we previously had detected none. As one of the contributors to *Robustness* states “there are always opportunities for an opportunist”, and the spatio-temporal framework in Figure 1 gives an idea of where to look for them. I deploy the old Greek concept of a chronotope, literally a place in time, in order to discuss and make sense of the spatio-temporal quality of the situation and the spatio-temporal responses that are relevant to it. When we face a problem or require a change, it comes equipped with its own relevant family of chronotopes. A different problem or a different change is always accompanied with different families of chronotopes, places in times, each one with its own unique structure.

A change in a spatio-temporal context requires a change in epistemology, methodology and leadership. When we move in Figure 1 along horizontal axis, from left to right, we move from a linear context to a disruptive one, inbetween them the degrees of order vary. However, if we move along the vertical axis, from the bottom up, we move from relevant histories to long-term visionary time scale. Every chapter in *Robustness* represents a specific spatio-temporal context and is placed in Figure 1 in its approximate position to enable us to discuss appropriate knowledge, ways of acquiring it and effective leadership.



**Figure 1** Chapter by chapter outline

In the introductory Chapter 1, I discuss how human beings have comprehended the *emergence* of things, and how our understanding of causality has evolved since the

time of Aristotle. Robert Rosen's Metabolism-Repair (M, R) systems and Niklas Luhman's interpretation of autopoiesis systems lay the basis for an anticipatory and adaptive human *systems* theory in which the robustness of a system stems from the fact that past, present and futures states can influence the present sense-making and decision-making in the system. In the end of Chapter the mission of the *Robustness* is revealed—to reconnect the spatio-temporal *contexts* into formation of knowledge, use of methods and appropriate leadership—and is comprehensively stated.

The second Chapter—Colonizing Futures—is set mostly in linear context, and it explains how the Newtonian paradigm has become the most popular approach even outside the boundaries within which it was originally meant to work. It demonstrates why it is not applicable in all human contexts. *Michael Loescher* then explicates what *time compression* means for the American steak business and draws out what that means for sense-making and decision-making.

Chapter 3—Revisiting Histories—sees human history as being multileveled, a place where various historical levels and accounts work as a causal force in the determination of present and future social realities in their own right. I also place much attention on the relationship between language and history as well as to the narrative reasoning of our lives. *James Deegan* demonstrates how personal *memoirs* and *emotions* contribute to *teaching* and *learning*.

Set in the context of disruption Chapter 4 takes its headline from a statement by Singapore Vice Prime Minister in which the following idea was presented; because we cannot know the future, we should concentrate on something what we can do. It is entitled Building Intelligent and Flexible Systems. First, *Chuan Lam Leong* uses his notable experience to make sense of management under *complexity* and *uncertainty*, sometimes under *risks* and *crisis*, and then I write with *Michael Loescher* about *operations analysis* and *non-military intelligence*.

Chapter 5—Preparing for Futures—describes how the art of prognosis, developed in the 15th century Italy in order to help avoid the pitfalls governments had had difficulties in evading, and to enable their overall preparedness for possible futures. The idea started to flourish in European courts and has turned into thousands of contemporary foresight projects. *Gerda Roeleveld* reveals the latest Dutch spatial planning project *Randstad2040*, arguably the most important area of the Netherlands, and views the relevant issues with reference to climate change and to preparing the necessary long term investment decisions of national importance.

The sixth Chapter liberates us from Newtonian or Cartesian views that see human mind in isolation, separated from an external reality. Instead, we try to understand the human condition in terms of intersubjectivism and relatedness, that is why the chapter is called—Relationships as a Cause. *Larry O’Connell*, *Rory O’Donnell* and *Riel Miller* shed light on the recent *FuturesIreland* project that combined the intra-personal, inter-personal and institutional perspectives in the search for New Ireland. In the end of Chapter 6 *Stefan Bergheim* broadens the traditional economic approach to growth with his article “*The breadth of societal progress*”.

Chapter 7—Probing Futures—works within disruptive futures. If we describe what we know as a sphere which is continuously growing, we should also consider that the area of contact with the unknown is expanding even more rapidly. Often we cannot rely on the traditional scientific and industrial strategies to project, predict and program our futures by using our knowledge of the past as a base on which safety and innovation can be established. We need new theories and ideas to cultivate opportunities, facilitate experiments, and create a more open mindset. *Riel Miller* takes a critical look at the financial crisis and embraces experimentalism in his paper on whether “*to experiment or not to experiment*”. *Rolf Jensen* uses a narrative—*From the*

*Few to the Many*—and creates a notional world to discuss how the significant social markers that have constructed and constrained our lives have evolved, and also places people inside that world to learn more about possible developments.

For many policy-makers, the Nordic countries have served as a model for economically, socially and environmentally sustainable societies. The final Chapter 8 begins with the current Nordic debate about horizontal and shared leadership as an alternative for the traditional hierarchical leadership. *Uffe Elbæk* brings in the World Outgames 2009 organized in Copenhagen to present his ideas about “*an event as an entrepreneurial and attitude-forming strategy*”, He also demonstrates how leadership can be achieved in a multi-cultural and multi-organizational environment. At the end of the chapter, I focus on the mission of the *Robustness* by reconnecting the spatio-temporal contextuality to leadership. Out of this reconnection comes the title: Leadership—Impact as Strategy.

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