Oliver Mack · Anshuman Khare
Andreas Krämer · Thomas Burgartz
Editors

Managing in a VUCA World

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Preface

Introduction

The world is changing. This is not something new, but today, due to a high global interconnectedness and an ever increasing pace of change, it has become more and more difficult for humans to keep pace with the technological, economical and social developments. The term VUCA describes some important factors of these developments and, therefore, has gained popularity these days. A simple Google search shows over 396,000 search results in January 2015 (Google, 29 January 2015).

VUCA stands for Volatility, Uncertainty, Complexity and Ambiguity. It describes a situation we humans were always confronted with: In the Stone Age, hunting and killing a mammoth was definitely a very difficult endeavour, having only simple weapons of that time and having the need to coordinate a group of hunters with simple tools. Also the environment appeared very VUCA to the hunters and gatherers of that time. Limited knowledge about nature, underlying patterns and interdependencies made it difficult to predict the weather, the risk of a snow avalanche or an earthquake or tsunami or other things. Today, we believe that we understand better and better "what holds the world together in its inner core", as Goethe wrote it in his "Faust" in 1808. Nevertheless, we still have the same feeling of VUCA in today's world and it seems to become more and more challenging for us to deal with it. What makes it so, is the case this book examines. Why do we still have this impression even though mankind and our knowledge have developed so much?

The idea of this book was to invite people from different professions and domains to think about this phenomenon and to work on ideas in this area with a special focus on business and management. Very much ahead of his time, Peter Drucker developed the idea that we are in the transition to a "Next Society", describing trends like the ageing society, the importance of knowledge or the new protectionism and that this will have an impact on organizations and subsequently on the global economy. Organizations need to be aware of and need to be prepared for this transition (Drucker 2001, 2007). Sociologist Dirk Baecker developed Drucker's idea further, providing concrete thesis for the next society, including first ideas for

the new form of culture, structure, integration, politics, economy, arts, science, religion, education, organization, etc. (Baecker 2011). These ideas show, that we need different tools and frameworks to deal with future situations. It is not enough anymore to stick to the tradition of the industrialization, seeing organizations as technical machines and managing and organizing them with this in mind. We seem to be at a point where new ideas and new concepts need room to be applied and tested in the business environment. This book should help to provide some starting points and ideas to deal with the next era. It should not be understood as the end of the road, but as the beginning of a journey exploring and developing new concepts for a new way of management.

References

Baecker D (2011) Zukunftsfähigkeit: 16 Thesen zur nächsten Gesellschaft. Revue für Postheroisches Management, Heft 9, 8–9

Drucker P (2001) The next society. http://www.economist.com/node/770819. Accessed 1 Nov 2001

Drucker PF (2007) Managing in the next society. Routledge, London

Review Process

Submitted chapters were doubly peer-reviewed by a team of academics and practitioners from around the world. Those chapters that provide a significant contribution to theory and/or practice were accepted for publication.

Vienna, Austria — Oliver Mack
Edmonton, AB, Canada — Anshuman Khare
Iserlohn, Germany — Andreas Krämer
Iserlohn, Germany — Thomas Burgartz

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Oliver Mack is Researcher, Entrepreneur, Coach and Consultant located in Salzburg and Vienna, Austria. He studied Business Administration and Law at the University of Mannheim and got his Ph.D. in Political Science at Johannes-Gutenberg-University of Mainz, Germany. He is author of several publications and speaker at international conferences and meetings, and he is academic teacher in international organizations. Mack is founder of mack:consulting, a consulting company helping companies and organizations in the "3rd mode of consulting", combination of traditional top management consulting and systemic change consulting in the main areas of Project Orientation, New Organizational Design and Restructuring/Change. Oliver Mack is Network partner of osb international Vienna, a leading Systemic Consulting companies in Europe. He is also founder of the xm:institute, an organization doing applied research and application of "Ideas for Management & Leadership in the Next Society". He is active in various associations like Board Member at GLOBArt, a leading Austrian Think Tank for the Future Society.

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Gerald A. Hollaus worked in Germany as consultant for the international consultancy company EFS which is focusing on future markets and technologies in the automotive industry. Afterwards coming back to Austria, he joined OMV for 7 years and worked in different Expert and Management positions in Marketing and Sales with the responsibility to lead an international team over ten countries in CEE. The next step of his career was to manage the turnaround in a small steel construction plant. At the same time, he was responsible—as director of the production plants—for the change management in a sawmill in Romania. Having worked in different industries, on different expert and management positions over more than 15 years, he is currently Managing Partner of the Positive Momentum Austria Consultancy.

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therapies" and "solution-focused geometric interviews", both combinations of a solution-focused brief therapy as defined by Steve de Shazer and a systemic family therapy are typical examples. Insa Sparrer gives training and coaching seminars at various psychotherapy and counselling institutions as well as courses at universities. She is active in Germany, Switzerland, Slovenia, Italy, Holland, England, Hungary and Greece. She published several books in the field of Solution Focus and Systemic Constellations.

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Part I
The Phenomenon of VUCA and Complexity

The authors of chapters in this section provide different perspectives on the phenomenon of VUCA and complexity in general and in a business context. Mack/Khare give an overview and provide a framework for the VUCA phenomenon, asking the question, if it can reduced to the idea of complexity. They also show different approaches in theory how to deal with it. In the second section, Ferrari/Sparrer/Varga von Kibéd reflect complexity and simplicity from the perspective of SySt®, a framework for systemic constellation work that can also be applied to situations in the business environment.

Chapter 1
Perspectives on a VUCA World

Oliver Mack and Anshuman Khare

Abstract The world has changed: Since the financial crisis, there has been an increased awareness about the globally interconnected world of business; its complexity and sustainability. Some would believe that its unpredictable and situations change rapidly which is resulting in the obsolescence of existing models to deal with complexity and uncertainty. Some call the situation today a "VUCA" environment (Volatility, Uncertainty, Complexity, Ambiguity) (http://knowledge-network.thunderbird.edu/research/2012/07/09/kinsinger-walch-vuca/).

The mainstream of applied management tools and frameworks is still unchanged: While the business environment is rapidly undergoing a change, the business tools and frameworks are lagging behind.

Need for broader knowledge and application new concepts and frameworks: This book attempts to bring together and discuss concepts, tools and frameworks for management to cope with the new situation. The book will be of use to academics, practitioners and those who are just starting to engage with the business world.

1.1 At the Corner of the Twenty-First Century

> I think the next century (21st century) will be the century of complexity.
>
> Stephen Hawking (1942-)

We live in the most amazing and also very challenging times. Fundamental disruptions are visible in all areas of our private and professional life. The industrialization effort since the first machine age has brought our society prosperity, wealth and development. During the last century, we applied engineering knowledge,

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starting with famous and successful researchers and business men like Henry Ford, Frederick Winslow Taylor or Henry Fayol to stabilize processes, to increase efficiency in production and to create giant global corporations. Over the last decades, progress in science and technology has led to rising globalization efforts and growth of the world economy leading to new inventions and choices in all areas of life. Continuous growth of the world economy has, to a great extent, made us believe that these paradigms and approaches we learnt, applied and developed will be sufficient for the future. But stagnating markets, increased global competition, steadily growing pace and the demand for continuous change makes organizations today feel more and more unsure whether the paradigms and tools of yesterday can address the challenges we will face tomorrow.

Peter Drucker observed in 2001 and 2007 that we are in the transition to a "Next Society", describing trends like the aging society, the importance of knowledge or the new protectionism and that this will have an impact on organizations and subsequently on the global economy. Organizations need to be aware of and need to be prepared for this transition (Drucker 2001, 2007). Sociologist Dirk Baecker developed Drucker's idea further, providing 16 thesis for the next society, including first ideas for the new form of culture, structure, integration, politics, economy, arts, science, religion, education, organization, etc. (Baecker 2011). Although it is impossible to predict the future and although it is still not clear where all the progress and technological development will take us, these first indications of a possible new society make very clear that we are in a period of massive transition.

Brynjolfsson and McAfee (2011, 2014) approach the transformation from a more technologically driven standpoint. In a study published in 2011 titled "The Race against the Machine", they described a change in society, where for the first time, a growing economy measured by its GDP comes along with increasing unemployment. This unemployment is not caused by sectoral changes, but a significant increase of productivity where human work is replaced significantly by automation provided by cheaper and more efficient computers or robots. Still sounding like a science fiction, this situation is becoming a reality, driven by Moore's Law which stated that the exponential rate of development of computing hardware will impact social change, productivity and economic growth. Named after Gordon Moore, cofounder of Intel, and first published in 1965, Moore identified that computer power doubled every 12 month at constant costs (Moore 1965). Today more or less still valid and transferred to other areas, like storage capacity and network speed, technology developed not linear but exponentially over the last 40 years. This helps today providing an infrastructure to store and process data and information at a marginal cost of almost Zero.

Brynjolfsson and McAfee (2014, p. 45) see our society today standing at the edge of the "second half of the chessboard". Quoting Ray Kurzweil's story of the inventor and the emperor (Kurzweil 2000), they express the inability of humans to think and deal with exponential growth, the inability of rating changes correctly and the blindness until stimuli have reached a certain level. As new technologies effect the organizational and social environment with a temporal delay, we are currently at the edge of significant changes in organizations driven by information technology and the internet.

The late Peter Drucker understood management as a function deeply rooted and connected to society (Straub 2013) and therefore a general discipline to be prepared and deal with todays and future challenges in all areas of life. Managers and leaders have to react on the new evolving situations by applying adapted approaches and tools. Scientists have to provide new ideas, concepts and paradigms to not only understand this change better but also to support this change in an adequate way to make the transition to the next society as smooth as possible without the disruptions that always come with large transitions as bearable as possible.

Although we are also not able to predict the future or the characteristics of the "Next Society" and the "Next Economy", we will approach the issue in three steps: First, we discuss a movement gaining momentum these days, focusing on the characteristics of the transition period and the "new normal"—the VUCA environment. Second, we will share some ideas regarding the theoretical approaches that might lead to a paradigm shift and help cope with the VUCA phenomenon. Third, we will focus on some areas of application in the field of business and economics to draw ideas regarding what this could mean for a new perspective in doing everyday business.

1.2 The VUCA Phenomenon

The nature of the changes in strategic environment were envisioned not just in business but also in politics and military sciences, where the term "VUCA" was invented. VUCA explains the new situation as:

> a world order where the threats are both diffuse and uncertain, where conflict is inherent yet unpredictable, and where our capability to defend and promote our national interests may be restricted by materiel and personnel resource constraints. In short, an environment marked by volatility, uncertainty, complexity, and ambiguity (VUCA). (Roderick 1998, p. 1; Yarger 2006, p. 17f)

Moving away from the bilateral perspective of the "Cold War" scenario, the American Army was confronted with a more multilateral global environment, characterized by different small and fast acting troops, loosely structured armies and even non-governmental militia. Military missions, like the ones in Iraq, Afghanistan, Somalia or against Somalian pirates provided a different situation that needed a different thinking and approach (Kingsinger and Walch 2012). Going away from the idea of stability and equilibrium, the acronym describes the new normal as a more or less state of instability at the edge of chaos (Yarger 2006). VUCA became the standard description of the modern environment, in which the US army operates today (Bouée 2013).

VUCA is an acronym standing for Volatility, Uncertainty, Complexity and Ambiguity. We would like to start with a brief description and definition of the elements in the context of business and economy:

- **Volatility**: The term volatility is commonly used in statistics and financial theory. Volatility can be defined as a statistical measure, describing the

amount of uncertainty about the size of changes. In statistics it can be quantified by the standard deviation or variance (Volatility n.d., 2014). Real life examples are increasing price fluctuations on global raw material markets or stock markets. You can see high volatility as significant jumps of values over time, which can be seen as an indicator of increasing pace of the environment (Kail 2010a).

- **Uncertainty**: With increased volatility of the environment, it is increasingly hard to predict the future. While in the past statistical regression models were able to predict the future, today it becomes more and more difficult to extrapolate future developments and link them with a probability distribution. Uncertainty can be also described as a lack of clarity to evaluate a situation properly to identify challenges and opportunities (Kail 2010b).
- **Complexity**: In an interconnected and networked environment, it becomes more and more difficult to connect cause and effect. The idea of linear causality hits the limits. Complexity can be defined as a situation, where interconnectedness of parts and variables is so high, that the same external conditions and inputs can lead to very different outputs or reactions of the system. A real life example are organizations or even more complex inter-organizational alliance networks where the same inputs can cause very different outputs at different points in time (Kail 2010c).
- **Ambiguity**: Ambiguity is characterized by the fact that causal relationships are completely unclear (Bennett and Lemoine 2014) and the meaning or interpretation of a situation cannot be definitely resolved according to a rule or process consisting of a finite number of steps (Ambiguity 2014). In contrast to vagueness that characterizes a situation by a lack of clarity, in ambiguity specific and distinct interpretations are permitted (Ambiguity 2014, Vagueness 2014). In real life, business decisions become more and more ambiguous, as there is often more than one possible solution to a problem and there is no analytical process to decide, which option should be chosen. If one asks different people for an evaluation of a specific situation and plans for action, one would get different answers which would be equally valid (Fig. 1.1) (Kail 2011).

In an action oriented approach, Bennett and Lemoine (2014) structure the four VUCA elements in a portfolio with the two dimensions concerning the knowledge about the situation and the predictability of the results of possible interventions. Depending on the situation, complexity, volatility, ambiguity and uncertainty are seen as different context types where different approaches are successful.

Although this might be a good way to have a simple VUCA framework to give pragmatic advice to leaders, we would like to choose another way of looking at the VUCA phenomenon. We do not see the four elements as different or separate phenomena but making complexity the key concept and seeing the other elements as the consequences of complexity (see Fig. 1.2). This is based on the theoretical perspective of Systems Theory and Complexity Theory on which we will go a bit more in detail.

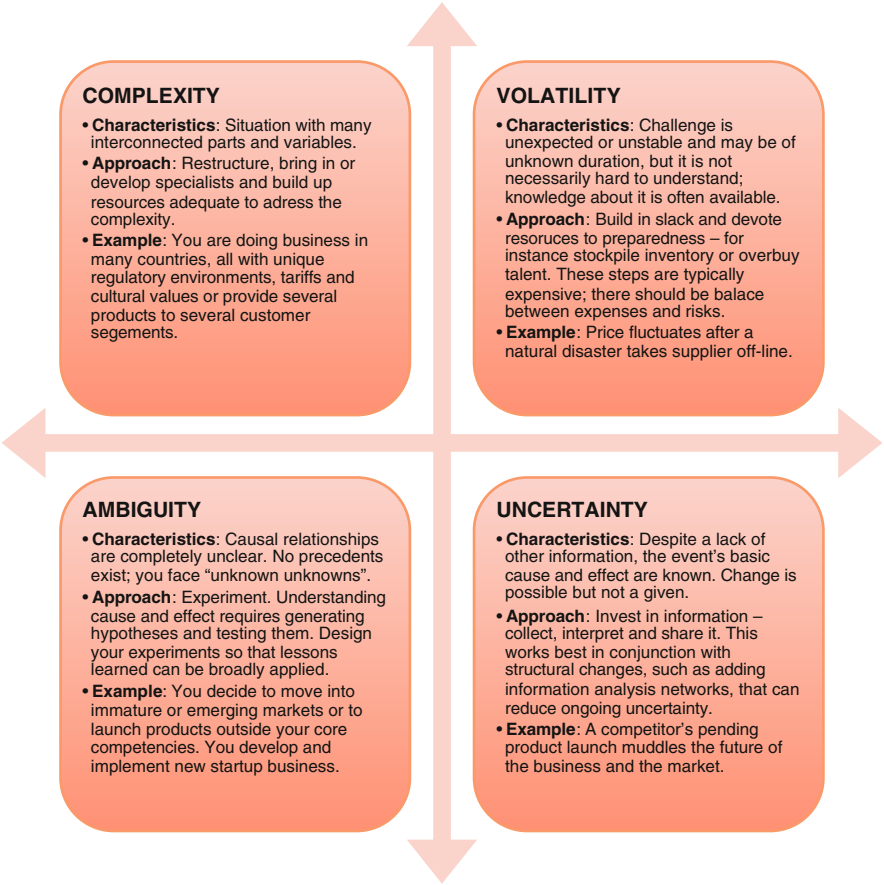

Fig. 1.1 VUCA Portfolio. *Source*: Adapted from Bennett and Lemoine (2014), p. 27

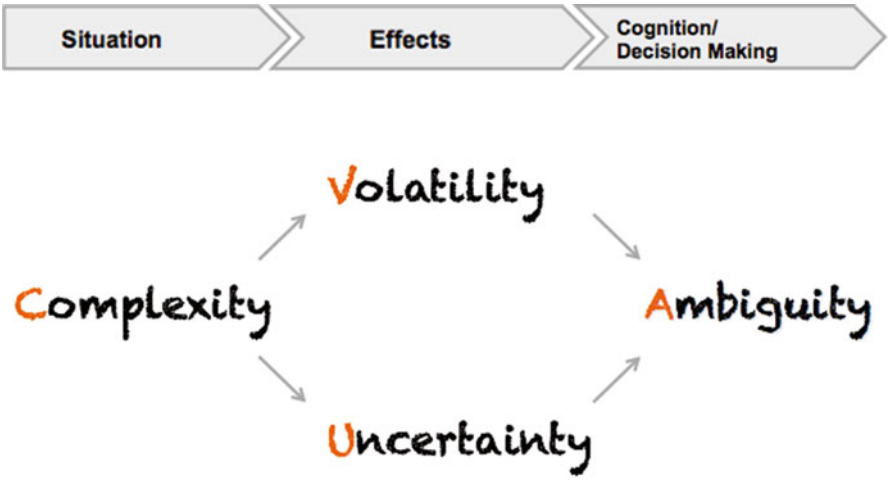

Fig. 1.2 Links between V.U.C.A.

1.3 Complexity as the Core Concept

Complexity as such is not easy to define (Mitchell 2009, p. 94ff). From a systems perspective complexity can be understood as a *specific property*, defined as the result of the amount of system elements, their relationships and the dynamics between the elements and the relationships. The more states a system can take, the higher the variety of the system. The variety can be then used as a measure of complexity (Dittes 2012, p. 2). In computer science for example the algorithmic complexity is measured by the size of the shortest possible computer program that can solve the problem or at least completely describe the problem (Mainzer 2008, p. 118). Generally speaking, complexity as *two aspects*: The complex structure of the system and the complex behavior of the system. The *complex structure* is given by the high amount of elements that are linked to each other in a non-trivial non linear way. In contrast, complicated structures are only characterized by a high amount of system elements and they are missing these intense internal structures of various relationships and dynamics between the elements (Dittes 2012, p. 3). *Complex behavior* is characterized mainly by emergence, which can be described as "the action of the whole is more than the sum of the actions of the parts" (Holland 2014, p. 1). If something contains many interacting objects whose behavior is affected by memory or "feedback", the interaction becomes non-linear (Holland 2014, p. 4). Complexity is also closely linked to organization, decomposability and nestedness of systems (Simon 1965). Emergence can be understood as "selected aggregates at one level become 'building blocks' for emergent properties at a higher level, as when H_2O molecules become building blocks for water. (…) Each level of hierarchy typically is governed by its own set of laws" (Holland 2014, p. 4). Complex adaptive systems are in-causal and dispositional. There are no foreseeable relationships between cause and effect. Fitness landscapes help to map and understand complex systems (Snowden 2012).

Some researchers even go one step further, seeing complexity not as a specific system property, but more as "an *attribute* ascribed by observers according to the number of distinctions that they are able to make in the domain in which they interact with that particular situation" (Espejo and Reyes 2011, p. 35). As an example, a car driver who knows nothing about mechanics sees relatively little complexity in the car he is driving. Engineers see the same car as much more complex in terms of the number of parts they can improve or change when developing new models. The example shows, that complexity level is mainly defined by the observer of a situation and the more distinctions an observer can make, the more complex the situation appears to him or her (Espejo and Reyes 2011, p. 35). We can also say, that the world is not getting more complex, but our understanding of the worlds complexity is getting more complex. We understand better how things are linked together.

Coming back to the VUCA phenomenon with this background, volatility and uncertainty can be interpreted in a different way; they can be seen, as **observable consequences** of complex systems or situations:

Volatility: In this context volatility can be understood as an observable output of a complex system that cannot be easily interpreted any more. While complex systems

which are in an equilibrium or which are oscillating between two or three different equilibria are easy to interpret, a system that runs in so called deterministic chaos has no obvious pattern to be easily observed (Mainzer 2008, p. 48). All complex (living) systems normally exist in a balance between equilibrium and non-equilibrium, regularity and irregularity, stability and instability. This state far beside an equilibrium near a chaotic state is called the "edge of chaos". In this state, small changes of system parameters or inputs can cause large and unexpected effects ("butterfly effect"). System behavior can not be exactly anticipated any more (McMillan 2004, p. 54f). And today's economy and environment seems to be more and more in a state "at the edge of chaos". With the increasing global trade and worldwide communication and interaction networks, societies, markets or the world as an ecosystem act farer away from system equilibria. As a consequence, traditional simplifying mechanistic models don't work any more.

Uncertainty: In the same context we can interpret uncertainty. Uncertainty can be defined as a lack of certainty. In comparison to risk, where it is possible to define a probability distribution for possible outcomes, in situations of uncertainty, this is impossible. In these cases, the information available to the decision-maker is to imprecise for developing a probability distribution (Epstein 1999).

Nandakumar et al. (2012) differentiate between different kind of environmental uncertainty:

- **State uncertainties**, when parts or the whole business environment is unpredictable
- **Effect uncertainties**, where effects of these uncertainties influence parts of the business or a company as a whole
- **Response uncertainty**, where the consequences of choice in decision making can not be judged.

All three types of uncertainty make it difficult for humans feeling comfortable in observing uncertainty and making decisions. But the phenomenon of uncertainty is not a new or a special one and there is a long tradition of decision making research on this topic. And even more important, in real world uncertainty is the normal as the future was and is always unpredictable. If this wouldn't be the case, no decision making would be necessary at all, everything would be determined (Ritholtz 2012). Like complexity, uncertainty can not only be defined as an independent property of the environment, but as an attribute ascribed by the observer. From this perspective it seems that people perceive a higher uncertainty of their environment these days than they did in the past. This can be closely linked to the volatility discussion above. In highly dynamic and complex situations or environments, people perceive a higher level of uncertainty (Duncan 1972). Uncertainty is a problem for humans especially in decision making that might arise if there is incomplete information, inadequate understanding of available information or equally attractive options (Grote 2009, p. 12ff). Over the last centuries, it seems that we humans have developed an increasing belief in the capability to cope with uncertainty and even to overcome uncertainty through planning and control (Böhle 2011). Todays decisions