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Pierluigi Contucci · Andrea Omicini  
Danilo Pianini · Alina Sîrbu (Eds.)


# The Future of Digital Democracy


An Interdisciplinary Approach

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## Preface

One of the most widespread misconceptions about the form of government that we call *democracy* is the *one man one vote* synthesis. In fact, this appears nowhere in the document most commonly considered the democracy manifesto, the speech by Pericles to the Athenians, as reported by Thucydides. From there, as well as from other beginnings, democracy has evolved following different historical tortuous paths, in a complex process of accumulation that has created institutions, laws, professions, and – unfortunately – misconceptions.

Tipping points along those paths have mainly occurred when structural revolutions have happened. The supply of energy, for instance, has been accompanied by radical changes in societal organization, and its daily consumption per capita rose from the 2,000 calories of our prehistory to the current 100,000 of the Western world, with a major sudden jump around the industrial revolution. In a similar way, the daily consumption of information per capita, albeit more difficult to measure, has grown enormously in the same time interval, due to the so-called digital revolution. The purpose of this volume is to analyze changes induced by this digital revolution in the Western political system and whether these changes are more (or less!) aligned with democratic principles.

But: *What is democracy?* The concept of democracy is one of the most complex and articulated in human culture. While it is based on suggestive ideas like the participation of all people to political and civic life and the protection of human rights, it also acts mostly with an oversimplified voting instrument like the majority rule on a single choice. It is no surprise, therefore, that its realization faces issues at many levels—especially with representing minorities and dealing with participation of people without a basic education. The question is, can we address some of those issues by changing the instruments used, by employing novel ideas in the field of social choice theory, and – possibly – through the *digital revolution*?

A paramount fact that has been observed in the past few decades is that political engagement is decreasing, especially in younger citizens, and when it is present it assumes a totally different shape. This can be due to several factors, including disappointment in election results, mistrust in society and politicians, lack of belief in the political system itself or in every one's power to make a difference. At the same time, participation in democratic life follows rules and usages that have emerged in the past couple of centuries, in times when *communication* was mostly different from today. *Horizontal communication* followed a slow, short-range, peer to peer path, while *vertical communication* was fast from institutions to citizens through traditional media.

Nowadays, instead, communication is much faster, and flows in every direction. Since communication is the basal fabric on which society is defined, it appears obvious that the civic organization and politics itself should adapt to the new status. Institutional inertia, nevertheless, causes large delays in updating and adapting. Therefore, the

balance between *participation* and *delegated representation* that worked relatively well after the Second World War is now facing a crisis.

A thorough understanding of the factors involved in participation is a first step toward providing solutions. Using the Internet to fill the gap and build a digital democracy provides an opportunity, along with several risks that need to be carefully analyzed. In order for this volume to achieve its objectives, it needs to be implemented using a fully inter- and trans-disciplinary perspective. This includes the social sciences, traditionally concerned with these topics, but, importantly, also the hard sciences, in particular mathematics and computer science, which provide a critical contribution to the field. The volume is thus organized in six chapters.

The first contribution (“Young People as Engaged Citizens: A Difficult Challenge Between Disillusionments and Hopes”), by Bruna Zani and Elvira Cicognani, precisely addresses the problem of disengagement of young people from political participation. By providing a fresh look on the sociological research on the subject, the authors discuss the causes of the disinterest from the classic forms participation, as well as the new forms of engagement, along with the factors that separate young people involved in new patterns of engagement and actions of participation from the inactive ones. Clearly, the focus here is on the new forms of participation and engagement, in particular on those based on the digital platforms, and on how these new forms may help and encourage youngsters to participate, express themselves, and possibly have their voice heard at national and European levels.

Yet, whereas sociological and politic aspects are essential to understand the current state of democracy and possibly foresee its future, there are technical aspects that have to be explored—even before digital ones. This is why the the second contribution (“Experiments on the Reaction of Citizens to New Voting Rules: A Survey,” by Jean-François Laslier) deals with *voting* itself, by discussing experiments and tests—lab, on-line, and in-situ voting experiments. In accordance with the overall scope of the book, the author focuses on the effect of *innovation* in politics—and in voting, in particular: how it affects the perception of the voters, their understanding, and their behavior, as well as how it does change the overall results of the voting.

The mathematics of voting is the theme of the third contribution (“Egalitarianism vs. Utilitarianism in Preferential Voting,” by Pierluigi Contucci and Alina Sîrbu). In particular, the authors introduce a novel mathematical approach to shape the new forms of democratic participation that involves social choice theory. Most (political) elections today require voters to select one option out of many, and results are based on majority votes. However, this oversimplifies voter opinions, limiting the individual freedom of expression, leaving instead ample maneuver room to the preliminary phases of the voting process. Additionally, due to the loss of information, results of the votes often do not correspond to the actual position of the population. This results in generating frustration and disappointment, and causing citizens to ignore subsequent elections. However, various other means to organize an election exist. For instance, ballots can be *rankings* of candidates, or *ratings*, with algorithms to extract the winner that can be fairer. Although significant research on these alternative voting systems has been performed (starting as early as the 18th century by Condorcet), they remain mostly unused. This is because no consensus exists on which method is best, while some methods can be also computationally expensive. Thus, the authors analyze preferential

voting, where voters are required to rank candidates. After reviewing the classic Condorcet criterium introduced to maximize the total satisfaction of voters, i.e., the utilitarian criterion, the authors describe a method to minimize the total un-evenness of the rewards, i.e., the egalitarian dimension. It is shown, through various examples, that the egalitarian dimension can produce fairer results, and also provide resilience to radicalism.

The fourth contribution (“Knowledge Management for Democratic Governance of Socio-Technical Systems,” by Jeremy Pitt, Ada Diaconescu, and Josiah Ober) relates the notion of *self-governing socio-technical system* (as well as self-governed institutions) to the success of Athenian democracy. The authors focus on the critical issue of *knowledge management* (knowledge aggregation, alignment, codification), and point out a number of emerging technologies that could work as the building blocks for democratic self-governance in socio-technical systems. After the discussion of the many open issues, the need for *responsible design* is emphasized, along with technologies promoting continuous re-design and self-organization—since “democracy is not an end state.”

The fifth contribution (“The Problematic Relationship Between Trust and Democracy; Its Crisis and Web Dangers and Promises,” by Cristiano Castelfranchi and Rino Falcone) discusses the articulated relationship between on-line and representative democracy. The authors claim first of all that digital democracy should not replace, but rather integrate representative democracy by leveraging computational tools and platforms. Then, they elaborate on the notion of (bilateral) trust in the relationship between people and their representatives (and institutions), arguing that even in the digital era trust remains an absolutely crucial issue to democracy.

Whereas sociological, political, psychologic, mathematical, and computational aspects are indeed essential to digital democracy, engineering issues are not to be overlooked whenever *digital platforms* become one of the main stages for the political play. Thus, the sixth (and final) contribution (“Democratic Process and Digital Platforms: An Engineering Perspective,” by Danilo Pianini and Andrea Omicini) elaborate on the huge (and often hidden) impact that digital technologies (potentially) have over all key processes in human societies—including the democratic one. The authors review the main tools and platforms for digital democracy, and point out how their tumultuous emergence in the past decade have left a number of essential concerns unanswered: in particular, the issue of the engineering process. By looking at the most common platforms for digital democracy, the authors show how the lack of care (and correct practice) in the software engineering of the digital platform invariably leads to critical problems for digital democracy. The most critical issues are pointed out, along with their potential (negative) impact on the democratic process.

Overall, the construction of this volume took several months—many more than expected, indeed. Other contributions were not included, not because of their lack in quality, but mainly because (in accordance with authors) we found them not precisely placed where this book was meant to be. The editors of this volume would then like to thank all the contributors – those who appear and also those who do not – for the many discussions we had with them, which really helped to shape the book in its final form.

Digital democracy is a hot topic nowadays, and is going to become hotter, its relevance growing along with the impact of computational platforms on our (political)

life. We are truly confident that this volume will contribute to a better understanding of the potential and dangers of digital democracy, possibly helping readers by going beyond the misunderstandings, the misconceptions, and the conceptual and practical abuses that the very notion of democracy is undergoing during this age of technological revolution and social turmoils.

June 2018

Pierluigi Contucci  
Andrea Omicini  
Danilo Pianini  
Alina Sîrbu



## Organization

“The Future of Democracy” was an ISA Topic 2016 event, sponsored by the Istituto di Studi Avanzati (ISA, Institute of Advanced Studies) of the Alma Mater Studiorum—Università di Bologna. It was organized in the context of the project “Il futuro della partecipazione democratica dei cittadini” (The Future of Citizens’ Democratic Participation), by Pierluigi Contucci, Marco Albertini, Giampiero Giacomello, Pina Lalli, Elvira Cicognani, and Andrea Omicini—all from Bologna’s Alma Mater.

The event was held in the Aula dei Poeti, at the Università di Bologna, on November 3, 2016, and articulated in two half-day meetings: a scientific workshop and a dissemination panel.

### Scientific Workshop “The Future of Democracy”

The first one (the scientific workshop “The Future of Democracy”) was devoted to the scientific discussion of all of the many facets of the issue of digital democracy. Held in the morning, it focused on the multi- and inter-disciplinary issues that affect digital democracy—mathematical, computational, political, economical, sociological, and political issues. After the presentation, the discussion was really lively, and produced many of the seeds that led to the elaboration of the present volume.

#### Speakers

Virginia Dignum	TU Delft, The Netherlands
Giampiero Giacomello	Università di Bologna, Italy
Dirk Helbing	ETH Zurich, Switzerland
Jean-François Laslier	Paris School of Economics and CNRS, France
Andreas Nitsche	Association for Interactive Democracy, Berlin, Germany
Danilo Pianini	Università di Bologna, Italy
Alina Sîrbu	Università di Pisa, Italy
Bruna Zani	Università di Bologna, Italy

### Dissemination Panel “Il futuro della democrazia”

The second one (the panel “Il futuro della democrazia”) involved representatives from the institutions, the culture, and the citizens, and was devoted to extend the perception of the main perspective and issues of digital democracy beyond the walls of academia.

#### Panelists

Chiara Alvisi	Università di Bologna, Italy
Massimo Fustini	Regione Emilia-Romagna, Italy
Daniela Giannetti	Università di Bologna, Italy

Matteo Lepore	Comune di Bologna, Italy
Terri Mannarini	Università del Salento, Italy
Marco Rocchetti	Università di Bologna, Italy

## Sponsoring Institutions

Finally, the event was sponsored by the following institutions:

- Institute of Advanced Studies (ISA)  
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- Dipartimento di Scienze Politiche e Sociali (DSPS), Università di Bologna, Italy  
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