

Preface

Specialized knowledge and expertise, especially of the kind that can shape public opinion, have been traditionally conceived to be the domain of individuals holding degrees awarded by higher learning institutions or occupying formal positions in notable organizations. Their expertise is validated by reputations established in an institutionalized marketplace of ideas with a limited number of “available seats” and a stringent process of selection and retention of names, ideas, topics, and facts of interest. However, the social media revolution, which has enabled over 2 billion Internet users not only to consume, but also to produce information and knowledge, has created a secondary and very active informal marketplace of ideas and knowledge. Anchored by platforms like Wikipedia, YouTube, Facebook, and Twitter, this informal marketplace has low barriers to entry and has become a gigantic, and potentially questionable, knowledge resource for the public at large.

The availability of these new knowledge markets poses some important research questions concerning the ways in which knowledge producers and users interact, and how knowledge is created and evolves. Credibility and quality of such knowledge is also a critical issue. Notions such as expertise and reputation need new definitions and metrics. Tools and methodologies to carry out research to answer those questions are needed, perhaps based on extensive data analyses. With the goal of creating and fostering a research community able to answer these questions, and also to identify novel related research directions, the US National Science Foundation founded the KredibleNet project—a multidisciplinary project involving researchers from different disciplines including computer science, social sciences, and statistics.

This book is the result of the first invitational KredibleNet workshop, which was held at Purdue University in April 2013. The workshop was an interactive forum to present the latest theoretical and methodological advances related to social media social roles, structures, and reputation research.

The workshop included sessions of “featured” presentations, followed by discussions, and two “round table” sessions, in which the discussants proposed possible future research agenda items related to social media roles, authority, and trust.

The core workshop topics included:

1. What are the most important existing or emerging Social Media knowledge markets and what distinguishes their working mechanisms?
2. What is the social structure of the emerging social media knowledge markets and what are the main motivator factors that fuel the individuals that are central in these social structures?
3. Which approaches based on social network analysis techniques can be used for defining “expert” reputation in informal marketplaces of ideas?
4. Which social graph topological configurations are associated with specific functional roles and levels of reputation in social media knowledge markets?
5. How do functional roles, reputation and authority emerge on social media knowledge generation projects and how can they be operationalized, measured and explained?
6. How does trust and knowledge credibility connect to specific functional roles and authority structures?
7. How can a new theoretical understanding of credibility, roles, and trust be turned into specific actionable tools and approaches to moderating knowledge market?
8. What are the most promising yet under-researched areas in the field of social media knowledge markets, especially with respect to authorship and reputation?

Workshop presenters were invited to author chapters for the book. As a result, the book represents a comprehensive research coverage concerning questions of trust and reputation in the new knowledge market.

The book is organized in several parts. The first part introduces the book and consists of two chapters. Chapter 1, titled “A Research Agenda for the Study of Entropic Social Structural Evolution, Functional Roles, Adhocratic Leadership Styles, and Credibility in Online Organizations and Knowledge Markets” by Sorin Matei et al., provides an overview of the KredibleNet project and the research agenda that has been formulated as part of the project. Notable research directions outlined as part of this agenda include how to use network analysis techniques for modeling functional roles and reputation, how to assess the stability of leading functional roles, and how to extend data analytics and statistic methods for functional role analysis. The chapter also introduces the novel concept of social entropy as one of the metrics for modeling collaborative spaces. In this context, entropy explains the degree of social organization in knowledge building spaces by measuring contribution inequality. Chapter 2, titled “Building Trusted Social Media Communities: Organizations, Motivation, Reputation” by Ben Shneiderman introduces several basic concepts including reputation, trust, and credibility and discusses how these concepts form the foundation for credible web-based communities.

The second part of the book focuses on methods for researching trust and credibility and consists of four chapters. Chapter 3, titled “*Semantic and Social Spaces: Identifying Keyword Similarity with Relations*” by Yun Huang et al. addresses the problem of identifying the expertise and topics of individuals participating in knowledge networks. Such information is critical in order to assess the quality of information in those networks. The chapter then proposes an approach based on

semantic tagging and text analysis. Chapter 4, titled “*Emergent Social Roles in Wikipedia’s Breaking New Collaborations*” by Brian Keegan focuses on temporal patterns of activities and collaborations of Wikipedia editors when dealing with breaking news. The chapter, based on an extensive analysis of four case studies, identifies several different patterns followed by editors of such news. Chapter 5, titled “*Words and Networks: How Reliable are Network Data Constructed from Text Data?*” by Jana Diesner, focuses on the key problem of designing methods supporting the reliable construction of network datasets that are then used for research in computational social networks. Chapter 6, titled “*Predicting Low-Quality Wikipedia Articles Using User’s Judgments*” by Ning Zhang, Lingun Ruan, and Luo Si, investigates the problem of assessing the quality of Wikipedia contents. The approach make uses of the Wikipedia reader feedback data to build a regression model able to predict the quality of articles.

The third part of the book focuses on tools for increasing trust and transparency and consists of Chap. 7, titled “*From Invisible Algorithms to Interactive Affordances: Data after the Ideology of Machine Learning*” by Bernie Hogan. The chapter addresses the important issue of how to support user navigation in information networks. The chapter introduces two different approaches based on two different “ideologies” and discusses how these approaches can be used for reputation analysis. An interesting point made by the chapter is that the “dominant ideology” used for information presentation is based on sorting and that this “ideology” is not well suited to the study of reputation and credibility.

The fourth part of the book focuses on novel research directions. It consists of three chapters. Chapter 8, titled “*Iron Law of Oligarchy: Computational Institutions, Organization Fidelity, and Distributed Social Control*” by Howard Welser, makes the point that recent developments in on-line communities and social networks can help overcoming the tendency that all organizations have in structuring themselves as oligarchies. The chapter elaborates on challenges and on the fundamental design elements needed to achieve a distributed control in organizations. The author proposes that a solution to the tendency of organizations to suffer mission drift and to allow the top agents of power to exploit it to their own advantage is to share dependence on the success of the organization across all agent roles, from the top ones to the rank and file. More importantly, he proposes a comprehensive system of contribution monitoring, visualization, and conditioning of rewards on inputs introduced in the system. Chapter 9, titled “*Cultural Differences in Social Media: Trust and Authority*” by Mei Kobayashi, makes the point that people with different cultures may exhibit different behavior in cyber space with respect to the perception of trust and reputation and therefore large-scale studies are needed to better assess the impact of cultural differences. The chapter also identifies the applications that may benefit for such an assessment and includes an extensive review of existing work. Chapter 10, titled “*Convincing Evidence*” by Andrew Gelman and Keith O’Rourke, focuses on statistical tools and makes the important observation that authorship, reputation, credibility and past experience play an important role in decisions about statistical procedures. The chapter also elaborates on issues related to the use of big data in research.

The book is concluded by Chap. 11, titled “The Trajectory of Current and Future Knowledge Market Research: Insights from the First KredibleNet Workshop” by Sorin Adam Matei, Brian Britt, Elisa Bertino, and Jeremy Foote, which reports the results of the discussions at the workshop with the goal of organizing such discussions into a research roadmap. Two broad research areas emerged during the workshop focusing respectively on theoretical frameworks and on methodologies to assess these theories. For each such area, the chapter covers the current state of the art and promising research directions.

As this book is result of a multidisciplinary effort to assess the current state of the art and identify novel research directions, we trust that the reader will find in the book interesting and novel research perspectives.

Purdue University, Lafayette, IN, USA

Elisa Bertino
Sorin Adam Matei

Roles, Trust, and Reputation in Social Media Knowledge
Markets

Theory and Methods

Bertino, E.; Matei, S.A. (Eds.)

2015, XIV, 198 p. 16 illus., 15 illus. in color., Hardcover

ISBN: 978-3-319-05466-7