

BOOK REVIEW

Computer-Supported Collaborative Decision-Making

F.G. Filip, C. B. Zamfirescu, C. Ciurea

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The book is dedicated to a balanced view of the computer-supported collaborative decision-making domain including concepts, methods key technologies and applications. It is intended to help users understand business models evolving towards the ever more collaborative schemes, the role of the decision-maker in the new business and technological context, the basic characteristic attributes and trends in the domain of decision-supporting information systems. A particular emphasis is put on collaborative aspects in decision-making activities and the impact of modern information and communication technologies upon the design and usage of decision-supporting information systems meant for different groups of people.

The book is structured in five chapters. Each chapter starts with a list of the key concepts addressed, its objectives and logical connection with previous chapters' contribution. At the end of each chapter a summary of its main conclusions and references to subsequent chapters that are based on its content are provided, as well as a list of exercises and the bibliography.

Chapter 1 – “Collaboration and Decision-Making in Context” describes the business context and reviews the main concepts concerning management and control schemes, the mission and allocated functions of the human agent in the loop, and basic aspects of multi-attribute/ multi-participant decision-making.

Section 1.1 – “The Evolving Controlled Object” reviews the ever increasing complexity of the controlled objects over the last four decades and describes the characteristic features of collaborative networks and their classification (virtual organization, virtual enterprise, extended enterprise, virtual team).

Section 1.2 – “From Hierarchical Control to Cooperative Schemes” is devoted to the hierarchical systems approach and transition towards more cooperative solutions.

Section 1.3 – “The Role of the Human in the System” emphasises the human role in decision-making loop and the need for effective computer supported collaboration, compared with time consuming and less efficient traditional cooperation methods.

In Section 1.4 – “Towards Anthropocentric Information Systems” several questions & answers are formulated about the interaction between human and the information system, in order to derive the main attributes of anthropocentric information systems.

Section 1.5 – “Decisions and Decision Units” a review of basic aspects of decision-making is made with particular emphasis on multi-criteria decision models.

Chapter 2 – “Decision Support Systems” details the basic concepts of the decision support systems domain with the aim of helping readers to understand the DSS “physiology” (functions and usage), “anatomy” (composition), and “ontogeny” (design and construction). A particular attention is paid to group/multi-participant DSS and intelligent DSS.

In Section 2.1 – “*Decisions and Decision-Makers*” presents Herbert Simon’s process model of decision making, the characteristic features of decision making problems that make a DSS necessary and decision maker’s limits and constraints that should be relaxed by means of a computerized support, classification of decision makers with respect to several criteria, such as: the composition of decision units, the decision powers of participants and so on.

Section 2.2 – “*DSS Basic Concepts*” is dedicated to the general definition of DSS, a presentation of several technology aspects (e.g. the knowledge-based framework of Bonczek, Holsapple, and Whinston, the particular subclasses of systems and tools), and a real-time DSS for control applications.

In Section 2.3 – “DSS Subclasses” several classifications are presented and made from various perspectives such as: number of users, type of support, and “dominant” technology. A brief presentation of the systems that combine numerical models with AI (Artificial Intelligence)-based technologies is made at the end of this section.

Section 2.4 – “DSS Construction” is focused on the design and construction aspects as viewed from a decision-making perspective: construction process as an opportunity and a means to implement the change within the organization, design approaches with particular emphasis on incremental, prototype-based one, general criteria for software selection together with a collaborative decision making procedure based on measuring individual and group preference and polarization.

Chapter 3 – “Collaborative Activities and Methods” examines the concept of computer supporting collaborative activities, as well as the most important methods used in collaborative human activities with a particular emphasis on group decision-making.

Section 3.1 – “Computer Supported Collaboration” explains several concepts, such as e-collaboration, collaborative groups, crowd participation, and provides a brief history of computer-supported collaboration.

Section 3.2 – “Fundamentals of Social Choice” presents the most frequently used voting rules defined in social choice theory (aggregating individual preferences, voting mechanisms) and their implications for Group Support Systems.

Section 3.3. – “Further Extensions from Social Choice Theory to Group Decisions” deals with extensions of these voting rules employed in knowledge-driven DSS and illustrated by judgment aggregation, resource allocation, group argumentation.

Section 3.4. – “Collaboration Engineering” reviews the engineering issues of deploying computer-supported collaborative activities in real working environments: basic collaboration patterns, collaborative decision-making process, collaboration models.

Chapter 4 – “Essential Enabling Technologies” contains a review of the major key technologies which have significantly influenced the design and usage of information systems. Their impact on computer-aided decision-making is highlighted. Business intelligence and analytics,

Web technology, social networks, mobile and cloud computing are described in distinct sections with similar organization: presentation of the concept and review of the value the technology can deliver to collaborative decision-making activities.

Section 4.1 – “Modern Data Technologies” addresses Big Data, Business Intelligence and Analytics used today on the way of implementing the Data Science concept.

Section 4.2 – “Web Technologies” presents the concept, particular subclasses, usages and relevance to collaborative decision-making exiting standards.

Section 4.3 – “Social Networks” reviews in a similar way the concept, particular subclasses, usages and the relevance to collaborative decision-making, and standards.

In Section 4.4 – “Mobile Computing” the concept, specific mobile computing tools and platforms used in collaborative systems and processes are presented, including their relevance to collaborative decision-making.

Section 4.5 – “Biometric Technologies for Virtual Electronic Meetings” overview these technologies as support to ensure the authentication of the people involved in the collaborative decision-making: the concept, particular subclasses, mobile and web-based technologies, possible attacks, attributes of effective technologies, standards.

Section 4.6 – “Game Technology as a Tool for Collaborative” is devoted to serious game mechanics and supporting software tools.

Chapter 5 – “Applications” contains the presentation of three applications with a view to illustrating concepts, ideas and results described throughout the book. three sections addressing: (a) the usage of biology inspired models to simulate the facilitator activity, (b) an application of big data in labor market analysis, and (c) an integrated and evolving information platform used in various collaborative decision-making cases.

Section 5.1 – “A Practical Swarming Model for Facilitating Collaborative Decisions” addresses the usage of biology inspired models to simulate the facilitator activity: the concept of stigmergic coordination, the computational model and its implementation (including e-Meeting as semantic environment, users’ behaviour, facilitation scenarios), results of a simulation experiment regarding performances of facilitator

schemes in the context of collaborative decision-making.

Section 5.2 – “*An Application of Data Mining to Decisions in Labour Market*” is dedicated to an application for data analysis in the particular context of labour market (a labour market decision support system). In this context the impact of facilitation strategies on performance and cognitive complexity of facilitation strategies are addresses.

Section 5.3 – “*iDecisionSupportPlatform*” presents the current version and expected evolution of the iDS platform which integrates several of the advanced information technologies described in the previous chapter.

Overall the book is very informative, covering a wide range of current topics of interest in the field of decision making based on modern information technologies.

Its content is carefully structured enabling either sequential approach in studying it or a personalized one using “pointers” to sections where the concepts and ideas just introduced are addressed in more detail. Each chapter contains a final section with Notes and comments that highlights the main ideas presented and guides the reader through the most important references from the long list provided at the end of chapter.

Reviewed by:

Gabriel NEAGU, PhD

Senior Research Scientist

National Institute for R&D in Informatics - ICI

8-10 Averescu Blvd. 011455 Bucharest 1, ROMANIA