

# RESEARCH IN THE DECISION SCIENCES — FOR THE — Service Economy



**EDSI**  
EUROPEAN DECISION SCIENCES INSTITUTE

Edited by Carmela Di Mauro,  
Alessandro Ancarani,  
and Gyula Vastag

BEST PAPERS FROM THE  
2015 ANNUAL CONFERENCE

# **Research in the Decision Sciences for the Service Economy**

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# **Research in the Decision Sciences for the Service Economy**

**Best Papers from the 2015 Annual Conference**

European Decision Sciences Institute

Edited by

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*To Andrea.*  
—*Carmela Di Mauro*

*To my children and grandchildren: Dora, Audrey, David, Adriana, and Gabriella.*  
—*Gyula Vastag*

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# Foreword by Keong Leong

It gives me great pleasure to write a foreword for the third issue of the EDSI book, which publishes the best papers from the 2015 European Decision Sciences Institute (EDSI) conference. The European Decision Sciences Institute has a special place in my heart since I was President when the first EDSI meeting was held in Barcelona at the campus of the IESE Business School in 2010. EDSI wants to “foster multinational research in Europe, giving the academic community from the Atlantic to the Urals, from the Polar Circle to the Mediterranean, a forum to network and engage in joint research projects.” EDSI is also committed to linking the European community to faculty around the globe.

I also attended the second conference in Wiesbaden, Germany. This was followed by my participation in the next two EDSI conferences in Istanbul, Turkey, and Budapest, Hungary. The EDSI conferences are some of the best-organized conferences I have been fortunate to attend. For example, the opening keynote address in Budapest in 2013 was at the historic Hungarian Parliament Building, seat of the National Assembly of Hungary, one of Europe’s oldest legislative buildings. We were sitting in the Upper House of the Parliament. As a participant, I found it an unforgettable experience listening to the opening plenary speech in such a historic setting.

Credit must go to Gyula Vastag for his incredible effort to get the best papers from the conference in Budapest in 2013 published in a book. This year the conference is held in Taormina, a small town on the east coast of the island of Sicily, Italy. Taormina is located on a hill of the Monte Tauro, and overlooking two grand, sweeping bays with breathtaking, dramatic, and memorable views of the Mediterranean Sea and the top of Mount Etna, Europe’s highest active volcano. What a dramatic backdrop for a conference! As part of the conference activities, participants are offered the opportunity to visit an award-winning winery at the foot of Mount Etna to learn about wine production and the global wine business.

Carmela Di Mauro (Program Chair) and Alessandro Ancarani (Program Co-Chair) have been working tirelessly to put together an excellent program for the participants. The theme for this year’s conference is “Decision Sciences for the Service Economy.” The global economy is increasingly being characterized as a service economy due to the growing role and share of the service sector in the economies of most developed and developing countries. In fact, a good indicator of a country’s economic progress is the growth of the service sector. Developed countries have experienced a gradual shift from the agricultural and manufacturing industries to an economy dominated by the service sector. Thus, it is appropriate that the aim of the conference is to provide “an arena for discussion based on multiple lenses, in the belief that the ability of our economies to achieve a further rise in value created passes through a deeper understanding of the growing role of services.”

This volume contains the best of the papers accepted for presentation at the EDSI conference. Papers in this volume span service research from healthcare to supply chain management. Another research in this area investigates the impact of social exchanges among hospital workers on work engagement in hospitals, which has an impact on organization performance. Improving

the budget management system in a healthcare organization using group concept mapping is the objective of another paper in this area.

In addition, we have several papers on supply chain management and purchasing. One stream of research examines the open issues involved in carrying out survey research in SCM. Another paper deals with the buyer–supplier relationship and learning strategy applied to supplier development. Another hot button is research on innovation in the context of a supply chain and the diffusion patterns of service innovations.

Improving public-sector service is clearly an important topic. We have timely research on examining the motives of reforming customer service in Hungary. Another group of research focuses on small and medium enterprises (SMEs). Finally, one paper suggests the need for taking a holistic approach to enhance research on strategic performance management in lean organizations.

In summary, the conference covers a wide range of research from services to manufacturing and for-profit to the public sectors. We look forward to an exciting conference filled with great research and wonderful opportunities for the European community to link with faculty from around the world.

—G. Keong Leong, *Associate Dean, College of Business Administration & Public Policy, California State University Dominguez Hills, President of Decision Sciences Institute (2010–11)*

# Foreword by Roberto Filippini

The *Decision Sciences Journal* states, “Decision Science is the union of quantitative and behavioral approaches to managerial decision making encompassing all of the functional areas of business.”

In recent years, Operations Management stands as one of the most dynamic managerial areas of business. Many research contributions coming from the Decision Science community deal with Operations Management. This area encompasses several topics, such as supply chain management, procurement, service management, and innovation. Recently, Operations Management has significantly evolved by looking at contingent needs of firms and the dynamism of the competitive environment, adopting different approaches, namely qualitative/conceptual, case study, and survey research.

This book offers an integrated perspective on the fertile combination of the Decision Science and Operations Management knowledge. The papers included in the book are selected from those presented at the EDSI Conference 2015, held in Taormina, Italy.

The reader can enjoy papers written by researchers coming from the schools of management of different countries: U.S., Canada, Ecuador, Belgium, Germany, Spain, Italy, Finland, Turkey, and Hungary.

The papers focus on three main areas:

1. Supply Chain Management
2. Service Management
3. Innovation and Competitiveness

The research interest is also directed toward small- and medium-sized enterprises (SMEs) which are at the backbone of many economies all over the world. Actually, four papers have SMEs as their unit of analysis.

As far as the methodology is concerned, it is interesting to notice that researchers use a variety of approaches:

- Survey research
- Conceptual/theoretical
- Case study
- Field study/experiment
- Simulation

The research community around Decision Science share some important values: the attention toward the real needs of organizations with the purpose to improve their capabilities and competitiveness, and the use of different research methods to investigate problems from different perspectives and finding appropriate solutions.

This book offers an interesting example of how these values may be implemented.

—Roberto Filippini, *Professor of Operations Management, University of Padua, Italy*

# Acknowledgments

There is a somewhat tongue-in-cheek saying about success having many fathers (while failure is an orphan). By all measures, EDSI 2015 in Taormina (Italy) was a success, and I could not have done it without the support and help of many fathers who helped me all the way.

I am particularly indebted to my home institution (University of Catania), my rector, Giacomo Pignataro, and my co-chair, Alessandro Ancarani, for their support during the preparations and throughout the conference.

We all benefited tremendously from Marco Sartor's (University of Udine) unrivalled organizational skills and personal touch that he put to good use in coordinating the doctoral consortium and organizing the live case study sessions. The participants of the doctoral consortium benefited greatly from the keynote presentations of Krishna Dhir and Keong Leong and the feedback they received from Alessandro Ancarani, Sukran Atadeniz, Constantin Blome, Louise Knight, and Gyula Vastag, who served as discussants; I am grateful to them.

In addition to the doctoral consortium, at EDSI 2015 we had plenary/keynote addresses and panel discussions. I owe a great deal of thanks to the following:

- Martin Spring for delivering a keynote speech on “The Shifting Terrain of Service Operations Management”
- Manus Rungtusanatham for delivering a keynote speech on “Theory-Driven Survey Research in Supply Chain and Operations Management: Reflections, Relevance, and Rigor”
- Andrea Rapisarda for delivering a keynote speech on “Efficient Promotion Strategies to Face the Peter Principle”
- Matteo Lo Presti and ST Microelectronics for the keynote presentation on “From IoT to Industry 4.0: High-Tech Evolution to Support the Fourth Industrial Revolution”
- Marina Collautti and Generali Group for the keynote presentation on “We, Generali: The Transformation Journey”
- Constantin Blome, Manus Rungtusanatham, and George Zsidisin for participating in the panel on “Publishing in Top Journals”
- Hope Baker, Krishna Dhir, Lori Franz, and Gyula Vastag for participating in the panel on “Accreditation and Student Learning”
- Ram Narasimhan, Xiande Zhao, Helen Walker, and Florian Schupp for participating in the panel on “Global Supply Chain Performance”
- Alessandro Ancarani, Kathleen McFadden, Louise Knight, and Francesco Giuliano for participating in the panel on “Health Care Challenges”
- Volker Kraft and Paolo Chiappa for giving a tutorial on “Overcoming Obstacles in Data Mining”
- Joy Field for offering a tutorial on “Teaching Quality Management as an Experiential Course Using a Six Sigma Green Belt Certification Framework”



Thanks are also due to Francesco Mascali (University of Catania) for his generous assistance in conference organization and the conference secretariat of Federica Cristauro, Sandra Lazzarini, and Maurizio Salamone.

—Carmela Di Mauro, *Conference Chair, EDSI 2015*

# About EDSI

EDSI, a regional subdivision of the Decision Sciences Institute (DSI), is a nonprofit professional organization of European researchers, managers, educators, and students interested in decision-making techniques and processes in private and public organizations.

EDSI was founded in August 2009 by approval of the board of DSI under its President, Ram Narasimhan, and President-Elect, G. Keong Leong.

EDSI works toward accomplishing DSI's vision of becoming the premier society for decision-making professionals based on the following key principles:

## *Focus on Relevant Academic Research and Knowledge Dissemination*

EDSI aims to promote research about business decisions in the European context. It endorses research that meets the requirements of academic rigor and business relevance. The institute disseminates research of its members within the academic and the business community by means of publications, conferences, and other services. Target audiences are the academic community—both graduate students and faculty—as well as business practitioners who are interested in cutting-edge research.

## *Use a Multidisciplinary Research Approach*

For EDSI, business decisions are not restricted to the classical Decision Sciences, but are seen in a wider context, ranging from operations to marketing and finance, as well as other areas. EDSI provides a forum for research that approaches complex business-decision problems with a multidisciplinary perspective, using accepted, rigorous research methodologies.

## *Create a Truly European Network*

EDSI wants to foster multinational research in Europe, giving the academic community from the Atlantic to the Urals, from the Polar Circle to the Mediterranean, a forum to network and engage in joint research projects. In doing so the network also aims to foster efforts of its members to obtain research funds from national and transnational institutions such as the European Commission. EDSI is also committed to linking the European community to its peers around the globe.

## *Emphasize Teaching and Research*

EDSI sees excellence in teaching as a key enabler to disseminate its research and have impact in the business community. To achieve this objective, EDSI provides a platform for dissemination of research related to the pedagogical dimension of business-decision problems.

## *Collaborate with Established European Research Networks*

EDSI defines itself as a complement to established European research networks and, as such, it supports and welcomes collaboration with different organizations.

# About the Editors

**Carmela Di Mauro** is Associate Professor of Business and Management Engineering at University of Catania, Italy.

After graduating from the University of Catania, she earned a Graduate Diploma from the Johns Hopkins University and a M. Sc. in Project Analysis and Investment at York University in the U.K. She holds a D.Phil. in Economics from the University of York.

Her current research focuses on Health Care Management, Organization, Behavioral Operations Management, and Public Procurement. Her recent publications on these topics have appeared in *Social Science and Medicine*, *International Journal of Operations and Production Management*, *European Journal of Operations Research*, and *International Journal of Production Economics*.

She has coordinated several research projects and received research grants from the Italian Ministry of Research (MIUR), the National Research Council (CNR), and Ente Luigi Einaudi. She is also involved in consultancy activity, mainly directed to hospitals and healthcare organizations but also to public administrations and local governments.

She was executive board member and member of the editorial committee of the Italian Evaluation Association from 2009 to 2011. She joined EDSI in 2010. In 2011, she served as Vice-President for Southern-Europe; since 2012, she has been a member of the Executive Board, first as Secretary General and Treasurer and currently as President Elect. She is Program Chair of EDSI 2015. She serves as a member of the DSI Global Activities committee.

**Alessandro Ancarani** is Associate Professor of Managerial Engineering at University of Catania, Italy.

After graduating from the University of Catania, he took a D.Phil. in Managerial Engineering from the University of Rome “Tor Vergata.” He obtained the Italian National Qualification for Full Professorship in 2014.

His current research mainly focuses on Health Care Management, Behavioral Operations Management, Performance of Service Organizations, and Public Procurement. His recent publications on these topics have appeared in *Social Science and Medicine*, *International Journal of Operations and Production Management*, *European Journal of Operational Research*, *Journal of Purchasing and Supply Management*, and *International Journal of Production Economics*.

He has participated in several research projects and received research grants from the Italian Ministry of Research (MIUR), the National Research Council (CNR), and European Commission. He is also involved in consultancy activity, mainly directed to hospitals and healthcare organizations but also to public administrations and local governments.

He joined the Executive Committee of the International Purchasing & Supply Education & Research Association (IPSERA) in 2008. In 2009, he served as Vice-President; and in 2010 he was nominated President of IPSERA until 2012.

Since 2009 he has served in the Editorial Board of the Journal of Public Procurement (JoPP). In 2006, he joined as Associate Editor of the *Journal of Purchasing and Supply Management (JPSM)*.

He has been co-Editor-in-Chief of the *JPSM* since 2010.

He is a founding member of the European Decision Sciences Institute. He has been a chairman and an organizer of several conferences and he is Program co-Chair of EDSI 2015.

**Gyula Vastag** is Professor and Magyary Chair at the National University of Public Service (Budapest, Hungary) and Professor at Széchenyi University (Győr, Hungary).

Born in Hungary, he earned his Ph.D. and Doctor of Sciences degrees from the predecessor of Corvinus University of Budapest and from the Hungarian Academy of Sciences, and he finished habilitation at Corvinus University.

From the late 1980s, he spent almost two decades in the United States on the faculties of the Kelley School of Business (Indiana University), the Eli Broad Graduate School of Management (Michigan State University), and the Kenan-Flagler Business School (University of North Carolina at Chapel Hill). Between 2005 and 2007, he was Visiting Professor (part-time) at the University of Groningen (The Netherlands). He spent the 2000–01 academic year in Stuttgart, where he was Professor and Dean of Supply Chain Management Programs and held a visiting professorship afterward. Dr. Vastag co-authored two books, wrote eight business cases, and has contributed chapters to 15 books. His papers (30+ refereed journal publications) were published in a variety of peer-reviewed academic and professional journals in the United States and in Europe and in numerous conference proceedings. Gyula received several research awards: New Central Europe Distinguished Senior Researcher Scholarship (2014), Best Applications Paper Award by Alpha Iota Delta–The International Honor Society in Decision Sciences and Information Systems (2012), and Award for Research Excellence from Corvinus University (2009). He was the Founding Editor of the *Pannon Management Review*, is the Associate Editor of the *Decision Sciences Journal*, and serves on the editorial boards of the *Central European Business Review*, *Business Research*, *Logistics Research*, *International Journal of Quality Innovation*, and *Vezetéstudomány*.

Dr. Vastag has worked with a number of organizations including the Aluminum Company of America (Alcoa), Carlson School of Management (University of Minnesota), International Institute for Management Development (IMD) in Switzerland, Global TransPark Authority of North Carolina, Knorr-Bremse Hungary, the U.S. Federal Aviation Administration, North Carolina State University, International Institute of Applied Systems Analysis (Austria), ESSEC-Mannheim Business School (Germany), OTP Bank, and the University of St. Gallen (Switzerland).

He is a founding member and member of the Executive Board of the European Decision Sciences Institute, Vice President for Global Activities, and member of the Executive Board of the Decision Sciences Institute, where he has also served as Program Chair and Track Chair of DSI conferences. He is a founding member and past Associate Director of the Global Manufacturing Research Group. He served on the Executive Committee of the International Society for Inventory Research (1998–2006); between 2006 and 2014 he was a member of the Auditing Committee.

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# Introduction: EDSI Annual Conference 2015— “Decision Sciences for the Service Economy”

The European Decision Sciences Institute is a recent venture (2010) and one aiming to fill a niche still empty in the European context. Since its onset, the goal of the association has been to provide a forum for research that studies complex decision problems in business with a multidisciplinary perspective. Although we do not deny the benefits of highly focused organizations in terms of depth of analysis, we are also convinced of the advantages of creating networks of academics and of producing research where different perspectives meet in coping with business decision making. In this respect, we assimilate multidisciplinary research to Granovetter’s “weak ties” in networks and to his idea that “weak ties are indispensable to individuals’ opportunities” (1985:1378), however paradoxical this may sound.

The contributions from the 2015 conference bear witness to this view: Several of the papers presented look at specific problems using multiple and (sometimes) unconventional lenses, and this cross-fertilization can be effective in supporting managerial and policy decisions. To name just a few examples, Rehm, Schupp, and Matthyssens (Chapter 8) look at the problem of innovation from the perspective of purchasing, highlighting the contribution that purchasing departments can offer to innovations problems. Andrea Rapisarda, a trained physicist, and his colleagues (Chapter 12) use modeling and simulations to analyze the efficiency of different promotion strategies within organizations.

While remaining faithful to the DSI’s philosophy of a multidisciplinary view of Decision Sciences, each EDSI conference has a specific focus. The topic of EDSI 2015, “Decision Sciences for the Service Economy,” reflects the belief we have formed in several years of research and teaching, namely, that the ability of our economies to achieve a further rise in value created passes through a deeper understanding of the growing role of services.

No doubt, services represent today the largest slice of the economy of many countries, and the fastest-growing part of their business for many multibusiness companies. IBM is perhaps a paradigmatic example of this trend.

In addition, pre- and post-sale services have become an important element of manufacturing firms’ value proposition to their customers, thus making the analysis of service provision crucial not only to service organizations but also to manufacturing.

Finally, public services play an increasing role in modern economies, and their role is crucial to improve the quality of life of citizens and the competitiveness of firms.

In spite of the importance already attributed to services by their share in the economy, there is a need for further research that may contribute to challenge our present views of service provision. For instance, outsourcing in public services has also led to the diffusion of service triads in the public sector, whereby the recipient of the service buys it from an entity who is not the actual service provider. More generally, the easy access to global labor markets has created global service networks that call for structures, inter-organizational relationships, knowledge management, and human resource practices that innovate with respect to traditional supply chains.

Finally, some service sectors such as healthcare and public administrations can benefit from the contributions of operations management, management science, and MIS.

Four contributions in this book reflect the relevance assigned to services in the 2015 conference. Two contributions focus on healthcare—the high number of submissions we have received for the conference in this field is evidence of the growing interest toward research in healthcare operations and management. Safety and quality in healthcare have been shown to be crucially related to team support and supervisory relations, a topic taken by Di Mauro, Giammanco, and Giammanco (Chapter 3). Finally, Spooner and Cloutier (Chapter 2) analyze the clinical research budget process in the health sector.

Innovative public-sector services that improve efficiency and support competitiveness are the theme of the contributions by Hajnal and Kovács (Chapter 1), and by Ancarani and Turcati (Chapter 4). The former discusses the recent “one-stop” government customer services in Hungary, and the latter focuses on the Italian experience of public support for participation of companies in international public procurement tenders, through the provision of information and targeted assistance.

The remaining contributions of the book can be grouped into other subfields of business analysis: Supply Chain Management, Management, and Innovation and Competitiveness.

The supply chain management section offers diverse perspectives not only in terms of issues investigated but also in terms of country contexts and methodologies. A first issue raised by Rungtusanatham (Chapter 5) is the maturity of theory-driven survey research in supply chain and operations management. Using survey data collected in Spain and Poland, Michalski, Botella, and Piedra empirically examine the influences of asymmetry between partners on collaboration, integration, and performance between supply chain partners (Chapter 6). In Chapter 7, Kilpi draws on service logic and the knowledge-based firm concept to examine through case-based analysis the buyer–supplier relationships and learning strategies applied in supplier development in Finland. Acar and Atadeniz (Chapter 9) identify gaps in the supply chain integration literature, pointing to the need for research on the benefits of integration that enlarges the set of performance indicators. Zsidisin, Miemczyk, and Saunders (Chapter 10) contrast the traditional western

countries' perspectives on sustainability and corporate social responsibility with the goal to attain sustainable business practices in emerging regions of the world that are considered legitimate and congruent with the native populace. D'Urso, Chiacchio, and Compagno (Chapter 11) contribute to the field of behavioral operations by comparing purchasing behavior in newsvendor games with and without demand information, and tackle the problem of identifying the heuristics that best fit observed behavior.

The two papers in the management perspective section both offer novel views on well-known problems. Pluchino, Rapisarda, and Garofalo (Chapter 12) provide the physicist's view of the well-known Peter principle. By studying promotions in pyramidal organizations, these authors show that, under given conditions, random-selection choices can outperform meritocratic promotions. Appolloni, Bellisario, and Chirico (Chapter 13) present a state-of-the-art and research agenda on strategic performance management in lean manufacturing organizations, thus providing a strategic view of a typical operational problem.

The last section of the book contains two papers, both focusing on innovation in small and medium enterprises (SMEs). Because of their share in many economies, innovation in SMEs is a crucial area for economic growth. Yet, especially when open innovation is at issue, it still remains an underdeveloped topic. Cerchione, Esposito, and Raffa (Chapter 14) look at knowledge management tools and practices in SMEs, whereas Ancarani, Henke, and Lorentz (Chapter 15) present a state-of-the-art of open innovation research for SMEs.

We hope the readers will enjoy this collection of contributions and find them useful to generate insights for their research and their teaching.

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