

## Preface

Over the past decade, the strategic use of information systems has played an invaluable role in the explosion of information technology. However, adopting a strategic information system is rarely successful without the necessary care and attention. In today's fast-paced, on demand economy, implementation of information systems is a high risk, high reward decision. The impact of a thorough understanding of all vital aspects, ranging from specific mechanics of a system to the theoretical impact and future development, cannot be underestimated when investing in an information system.

Now, with the widespread use of strategic information systems and the efficiency expected by consumers in many industries, there is a call for greater research and development and for efficient systems in an ever widening spectrum of business, governments, and education. To keep up with the demand for newer and better systems, practitioners and researchers must keep abreast of the current research.

In order to provide the most comprehensive, in-depth, and recent coverage of all issues related to the development of cutting-edge strategic information systems, as well as to offer a single reference source on all conceptual, methodological, technical and managerial issues, as well as the opportunities, future challenges and emerging trends related to the development of strategic information systems, Information Science Reference is pleased to offer a four -volume reference collection on this rapidly growing discipline, in order to empower students, researchers, academicians, and practitioners with a comprehensive understanding of the most critical areas within this field of study.

Entitled "Strategic Information Systems: Concepts, Methodologies, Tools, and Applications," this collection is organized in eight distinct sections, providing the most wide-ranging coverage of topics such as: 1) Fundamental Concepts and Theories; 2) Development and Design Methodologies; 3) Tools and Technologies; 4) Utilization and Application; 5) Organizational and Social Implications; 6) Managerial Impact; 7) Critical Issues; and 8) Emerging Trends. The following provides a summary of what is covered in each section of this multi -volume reference collection:

Section 1, **Fundamental Concepts and Theories**, lays a foundation for the extensive research in the following sections. It begins with "The Nature of Strategic Intelligence, Current Practice and Solutions," by Mark Xu and Roland Kaye which complements the essential theories in "Strategic Alignment Between Business and Information Technology," by Fernando José Barbin Laurindo, Marly Monteiro de Carvalho and Tamio Shimizu. "Decision Support Systems," by John Wang and David J. Radosevich also provides an important perspective into how DSSs have changed the way business view information technology. Another consideration is discussed in "The Evaluation of Decision-Making Support Systems' Functionality," by Giusseppe Forgionne and Stephen Russell. This chapter includes an important discussion of how to best quantify and assess decision making systems. This section also includes chapters on the concepts underlying the effect of strategic systems with chapters like "Strategic Decision Making in

Global Supply Networks” by Ozlem Arisoy and Bopaya Bidanda, “Leveraging Supply Chain Management in the Digital Economy” by Mahesh S. Raisinghani, and “Information and Knowledge Perspectives in Systems Engineering and Management for Innovation and Productivity Through Enterprise Resource Planning” by Stephen V. Stephenson and Andrew P. Sage. These chapters provide a basis for further research and innovation.

Section 2, **Development and Design Methodologies**, illustrates the fundamental nature of the development stage. Selections such as “Strategic Technology Engineering Planning” by practitioners Tony C. Shan and Winnie W. Hua, “Design Science: A Case Study in Information Systems Re-Engineering” by Raul Valverde, Mark Toleman, and Aileen Cater-Steel, and “Design and Development of a Quality Management Information System,” by M. Sakthive, S. R. Devadasan, S. Ragu Raman and S. Sriram, introduce the reader to all of the various facets of developing strategic systems that can ensure success or cripple a project from the start. Other chapters like “Data Warehouse Design to Support Customer Relationship Management Analysis” by Colleen Cunningham and Il-Yeol Song, “Designing Clinical Decision Support Systems in Health Care: A Systemic View” by Wullianallur Raghupathi, and “A Framework for a Scenario Driven Decision Support Systems Generator,” by M. Daud Ahmed and David Sundaram provide specific examples of these critical underpinnings. “Challenges in Developing a Knowledge Management Strategy: A Case Study of the Air Force Materiel Command,” by Summer E. Bartczak, Jason M. Turner and Ellen C. England, and “A Methodology for Developing Integrated Supply Chain Management System,” by Yi-chen Lan and Bhuvan Unhelkar complete this section’s treatment of current design and development research.

The chapter “Intelligent Agents in Decision Support Systems” by Gloria E. Phillips-Wren begins the next section, **Tools and Technologies**, with a discussion of how web-based, distributed systems can combine with artificial intelligence techniques to aid decision makers. “Agents and Multi-Agent Systems in Supply Chain Management: An Overview” by Pericles A. Mitkas and Paraskevi Nikolaidou charts the current advances in applying multi-agent systems to supply chain management and is complimented by chapters such as “Beyond Intelligent Agents: E-sensors for Supporting Supply Chain Collaboration and Preventing the Bullwhip Effect” by Walter Rodriguez, Janusz Zalewski and Elias Kirche, “Intelligent Supply Chain Management with Automatic Identification Technology” by Dong Li, Xiaojun Wang, Kinchung Liu, and Dennis Kehoe, and “Supply Chain Management and Portal Technology” by Scott Paquette. Supply chain management is not the only sector affected by the research in this section. Chapters like “An Ontology-Based Intelligent System Model for Semantic Information Processing,” by Mark Xu, Vincent Ong, and Yanqing Duan, “A Knowledge Integration Approach for Organizational Decision Support” by Kee-Young Kwahk, Hee-Woong Kim and Hock Chuan Chan, and “Mobile Technologies in the New Zealand Real-Estate Industry,” by Eusebio Scornavacca and Federico Herrera, provide perspective into the current tools that are setting trends reaching across many different industries.

Section 4, **Utilization and Application**, introduces research conducted on what is often the crux of any innovation. The actual worth of a system is in its proper use, and chapters like “I-Fit: Optimizing the Fit between Business and IT” by Alea Fairchild, Alea Fairchild, Piet Ribbers, Erik van Geel and Geert Snijder, “Managing Executive Information Systems for Strategic Intelligence in South Africa and Spain” by Udo Richard Averweg and José L. Roldán, and “An Application of Multi-Criteria Decision-Making Model for Strategic Outsourcing for Effective Supply-Chain Linkages” by N. K. Kwak and Chang Won Lee chronicle how best to ensure proper application. This is never more important than in healthcare, discussed in “Nonparametric Decision Support Systems in Medical Diagnosis: Modeling Pulmonary Embolism” by Steven Walczak, Bradley B. Brimhall and Jerry B. Lefkowitz, and “Decision Making by

Emergency Room Physicians and Residents: Implications for the Design of Clinical Decision Support Systems,” by Michael J. Hine, Ken J. Farion, Wojtek Michalowski, and Szymon Wilk, and “Decision Support Systems for Cardiovascular Diseases Based on Data Mining and Fuzzy Modelling” by Markos G. Tsipouras, Themis P. Exarchos, Dimitrios I. Fotiadis, Aris Bechlioulis and Katerina K. Naka. In these chapters, and in this entire section, the reader is given a clear understanding of the dynamics involved in applying and using decision support systems.

Understanding and quantifying implementation strategies is an important part of applying strategic systems, but also necessary for understanding the issues created by these systems. Section 5, **Organizational and Social Implications**, presents ways that strategic systems affect the preexisting “human systems.” “Supporting Distributed Groups with Group Support Systems: A Study of the Effect of Group Leaders and Communication Modes on Group Performance” by Youngjin Kim, and “Supporting Structured Group Decision Making Through System-Directed User Guidance: An Experimental Study” by Harold J. Lagroue III, both consider how to aid group decision making. Other chapters, including “E-Collaboration Using Group Decision Support Systems in Virtual Meetings” by Jamie S. Switzer and Jackie L. Hartman, “K-link+: A P2P Semantic Virtual Office for Organizational Knowledge Management” by Carlo Mastroianni, Giuseppe Pirrò and Domenico Talia, and “Organizational Culture for Knowledge Management Systems: A Study of Corporate Users” by Andrew P. Ciganek, En Mao and Mark Srite, broach the topic of organizational management. “Organizational Readiness Assessment for Knowledge Management” by Kaveh Mohammadi, Amir Khanlari, and Babak Sohrabi and “Strategic Alliance Capability: Bridging the Individual Back into Inter-Organizational Collaboration” by Christiane Prange, look at two specific issues in organizations, discussing how these systems can affect and enable knowledge management. Lastly, this section includes a look at a number of contexts through chapters such as “SHRM Portals in the 21st Century Organisation” by Beverley Lloyd-Walker and Jan Soutar, “Ethnographic Discovery of Adverse Events in Patient Online Discussions: Customer Relationship Management” by Roy Rada, “The Factors Influence Suppliers Satisfaction of Green Supply Chain Management Systems in Taiwan,” by Hsiu-Chia Ko, Fan-Chuan Tseng, Chun-Po Yin and Li-Chun Huang, and “The Strategic Implications of E-Network Integration and Transformation Paths for Synchronizing Supply Chains,” by Minjoon Jun and Shaohan Cai.

The next section, Section 6, **Managerial Impact**, delves into the concerns created by and solved by humans managing these systems. The first chapter “IT-Enabled Strategy: Implications for Firm Performance?” by Paul L. Drnevlch discusses some of the opportunities that information systems offer to enhance performance, as well as identifying potential pitfalls. “Building the IT Workforce of the Future: The Demand for More Complex, Abstract, and Strategic Knowledge” by Deborah J. Armstrong, H. James Nelson, Kay M. Nelson, and V.K. Narayanan builds on this discussion by exploring the necessary mindsets required by a fully modern business. One of these shifts is the subject of “Managing Knowledge Capabilities for Strategy Implementation Effectiveness” by Sineenad Paisittanand, L. A. Digman and Sang M. Lee, in which the authors researched the effect of knowledge process capabilities on strategy implementation effectiveness. Also included in this section are chapters addressing topics related to customer relationship management, human resources, and financial management, presenting the complete, empirical view of how strategic systems affect the modern management of resources.

Section 7, **Critical Issues**, highlights the reasons for failure and success of system implementation and utilization. The following chapters are an important reference for both researchers and practitioners, featuring case studies and recent developments. The selections “Information System Development Failure and Complexity: A Case Study,” by Abou Bakar Nauman, Romana Aziz and A.F.M. Ishaq, “Empirical

Assessment of Factors Influencing Success of Enterprise Resource Planning Implementations” by Fiona Fui-Hoon Nah, Zahidul Islam, and Mathew Tan, and “A Strategic Framework for Managing Failure in JIT Supply Chains” by Jaydeep Balakrishnan, Frances Bowen, and Astrid L.H. Eckstein provide case studies and examples from functioning business and organizations. These selections give real-time problems and solutions that are invaluable when it is necessary to avoid any pitfalls. Chapters like “Information Feedback Approach for Maintaining Service Quality in Supply Chain Management,” by R. Manjunath, “Towards Stable Model Bases for Causal Strategic Decision Support Systems” by Christian Hillbrand, and “Supporting Demand Supply Network Optimization with Petri Nets” by Teemu Tynjala, explore how to approach and solve problems that develop from using strategic information systems. This section also includes chapters addressing more delicate ethical issues, as in “Security Policies and Procedures” by Yvette Ghormley and “Privacy and Security in the Age of Electronic Customer Relationship Management” by Nicholas C. Romano, Jr and Jerry Fjermestad.

Lastly, Section 8, **Emerging Trends**, provides an exciting view of the cutting-edge research currently being conducted. “Enterprise Resource Planning (ERP): Past, Present and Future” by Ronald E. McGaughey and Angappa Gunasekaran is an excellent overview of the present and an insightful look into the future areas of development. Ashley Davis’s contribution, “Enterprise Resource Planning Under Open Source Software,” explores the possibilities and critical factors offered by open source software. The expansion of strategic information systems is the subject of such chapters like “The Dynamics and Rationality of Collective Behavior within a Global Information System” by Jacek Unold, “Toward an Interdisciplinary Engineering and Management of Complex IT-Intensive Organizational Systems: A Systems View” by Manuel Mora, Ovsei Gelman, Moti Frank, David B. Paradice, Francisco Cervantes and Guisseppi A. Forgionne, “Strategic Technology Planning for the Techno-Global Economy: Cities in the Market” by Al D. McCready, and “Enhancing Decision Support Systems with Spatial Capabilities,” by Marcus Costa Sampaio, Cláudio de Souza Baptista, André Gomes de Sousa, and Fabiana Ferreira do Nascimento. Innovation is also taking place where strategic systems are common as shown in “Strategic Decisions for Green Electricity Marketing: Learning from Past Experiences” by Marta Pérez-Plaza and Pedro Linares, “The Future of Supply Chain Management: Shifting from Logistics Driven to a Customer Driven Model” by Ketan Vanjara, and “System Dynamics Modeling for Strategic Management of Green Supply Chain,” by Ying Su, Zhanming Jin, and Lei Yang. This section forms an invaluable aid for spurring on further research and creating new applications to aid all areas of future societies.

Although the contents of this multi-volume book are organized within the preceding eight sections which offer a progression of coverage of important concepts, methodologies, technologies, applications, social issues, and emerging trends, the reader can also identify specific contents by utilizing the extensive indexing system listed at the end of each volume. Furthermore, to ensure that the scholar, researcher, and educator have access to the entire contents of this multi-volume set, as well as additional coverage that could not be included in the print version of this publication, the publisher will provide unlimited, multi-user electronic access to the online aggregated database of this collection for the life of the edition free of charge when a library purchases a print copy. In addition to providing content not included within the print version, this aggregated database is also continually updated to ensure that the most current research is available to those interested in strategic information systems.

Strategic information systems will undoubtedly continue to become increasingly important to all facets of life in a modern society. Therefore, a complete understanding of the concepts and research offered in this book will be instrumental to the achievement of any structured goal whether in business, government, education or even daily life. Although strategic information systems promise to effectively

manage all facets of an organization, experience has proved that only through careful and responsive implementation can these promises be fulfilled completely. These volumes are the building blocks to reach the desired functionality.

The diverse and comprehensive coverage of strategic information systems in this four-volume, authoritative publication will contribute to a better understanding of all topics, research, and discoveries in this developing, significant field of study. Furthermore, the contributions included in this multi-volume collection series will be instrumental in the expansion of the body of knowledge in this enormous field, resulting in a greater understanding of the fundamentals while also fueling the research initiatives in emerging fields. We at Information Science Reference, along with the editor of this collection, hope that this multi-volume collection will become instrumental in the expansion of the discipline and will promote the continued growth of strategic information systems.