# Editorial Scope

Contemporary progress in industry, government, and academia is strongly tied to progress in the ability to deal effectively with issues that concern information, associated knowledge, and large systems involving technology and humans that are necessarily concerned with information and knowledge. This involves integration of information technology and organizational strategy. It also involves major attention to systems engineering and systems management, especially in terms of resource commitments and expectations of functionality, quality, schedule, and costs. An overriding concern is risk management to assure trustworthy and responsive information and knowledge based systems throughout enterprises.

Three interacting aspects of management affect enterprises' abilities to achieve desired levels of integration, productivity, and performance:

- Information Management
- Knowledge Management
- Systems Management

These three aspects are the focus of: **Information ● Knowledge ● Systems *Management***. We are interested in publishing articles that provide thoughtful treatments of approaches to principles, practices, and perspectives related to systems of all types. We are especially concerned with systems that involve significant interactions of organizations and computer and communications technologies, particularly those that are software intensive and support the use of information and knowledge capital for organizational and societal improvement.

This journal is intended to become a primary source of information for those responsible for engineering and managing:

- Information systems environment that support effective technology development and organizational management, or **Information Management**.
- Enterprise environments for knowledge development, integration, and transfer, or **Knowledge Management**.
- Processes for identifying needs, developing approaches to meeting needs, deploying integrated solutions in operational settings, and ongoing managing of these solutions, or **Systems Management**.

There are a number of component disciplines that, taken together, comprise the transdisciplinary approaches encouraged for articles in this journal. Information Science, or Information Systems, is the discipline that deals with the processes of acquisition, representation, storing, transfer, and use of information. This endeavor often brings together approaches from various disciplines — computer and communication science and engineering, library science, linguistics, psychology — in order to develop information technology based techniques and devices that enable these processes.

The historical foundations of Information Science/Information Systems are associated with three developments: the Shannon–Weaver theory of information, Norbert Wiener's work leading to the science of cybernetics, and contemporary and rapid advances in electronic digital computers and communications. Initially, Information Science/Information Systems was primarily concerned with applications of digital computer technology to the processing and managing of documents and data. This lead to many developments in data base management systems and the development of management information systems, both as products and as a discipline. Information resource management was a natural outgrowth of these developments.

With continued evolution of computer and communications technologies, the discipline of Information Science/Information Systems became a natural part of the broader area of Information Technology. Soon, it became recognized that the field of Information Technology could not be dominated by technology alone. Behavioral and organizational considerations associated with information have come to overshadow strictly technological issues, in terms of access, utilization, and impact of information and knowledge, as well as management of underlying technologies.

Many organizations are attempting to use information technology based approaches to enable organizational reengineering for the 21$^{st}$ century. This includes efforts aimed at strategic sizing, and improving the efficiency and effectiveness of organizational infrastructure and processes. In almost all cases, this is associated with much greater attention to and reliance upon computer and communication technologies, and associated software. The resulting information technology based systems are better able to integrate, and to be integrated effectively into, human enterprises. These systems involve networking, cooperative work, concurrent engineering, and other strategies for innovation that enable the creation of more successful products and services.

Enterprises are beginning to realize that knowledge is the organization's most valuable asset, typically embodied in employees. This knowledge is a key enabler of the aforementioned transformations. This high-level recognition must, of course, be converted into pragmatic action guidelines, plans, and specific approaches. Knowledge is an asset, to the individual and the organization, and effective management of knowledge requires other organizational investments in technology and human labor to insure appropriate knowledge work processes. Knowledge management also has behavioral and sociopolitical attributes and requires processes to facilitate identification, distribution, storage, and use of knowledge. In particular, knowledge sharing is required if organizations are to leverage knowledge assets. This requires incentive systems and appropriate rewards for active knowledge creators or numerous difficulties may be encountered. Both the legalities and ethics of knowledge management need to be strongly considered.

Much of this knowledge is integrative in nature, brought about by processes that involve people, organizations, and technology. The role of the information technologies of computers, communication systems, and software in enhancing these developments is ubiquitous. However, these are only enabling technologies. They are necessary for the needed developments of transdisciplinary and networked learning organizations, but they are by no means sufficient. Of particular importance are approaches for addressing the complexity of interactions and integration of enabling technologies with people and organizations.

Knowledge complexity can be addressed through knowledge integration and knowledge process integration. With appropriate management of the environment for knowledge creation, acquisition, representation, transmission, and use; relevant contemporary problems can be the focus of issue-centered studies. Such studies avoid the reductionism and compartmentalization of traditional approaches and cross boundaries of domains and disciplines whenever the issues of interest warrant this. New institutional forms and frameworks are often needed in order to bring about the needed transdisciplinarity. These frameworks involve: humans, organizations, technologies, and environments in ways that support knowledge integration and knowledge process integration.

The unprecedented technological advances in the information technologies of computation, communication, software, and networking create numerous opportunities for enhancing quality of life, quality of critical societal services such as health and education, and productivity and effectiveness of organizations. Emerging new human activities demand new processes and strategies for engineering and managing systems of all types. The major need is for appropriate management of people, organizations, and technology as an overall system, with technical, economic, social, and political attributes. This is here denoted as systems management and comprises the third major area of interest

for this journal. Our goal is to consider information, knowledge, and systems management as a coherent whole.

**Information ● Knowledge ● Systems *Management***, published by IOS Press in Amsterdam, focuses on the above transdisciplinary issues. The major subjects areas of interest to the journal include the following, in alphabetical rather than priority order:

- Activity based costing
- Benchmarking in systems engineering
- Cognitive ergonomics
- Collaboration technology
- Complex adaptive system for knowledge management
- Concurrent engineering
- Configuration management
- Cooperative systems
- Decision support systems
- Economic systems analysis
- Evolutionary and path dependent economic phenomena
- Functional economic analysis
- Inductive reasoning and knowledge management
- Information and knowledge economics
- Information, knowledge and systems process maturity
- Integrated product and process development teams
- Learning organizations
- Management and leadership in knowledge-intensive enterprises
- Metrics for information, knowledge, and systems management
- Negotiation support systems
- Networked and emergent organizations
- Organizational design and evaluation
- Organizational simulation and modeling
- Qualitative information and knowledge processing and reasoning
- Quality assurance and management
- Reengineering at the level of product, process, and organization
- Requirements engineering and management
- Risk management
- Software systems engineering
- Systems engineering standards
- Systems integration
- Systems management processes
- Systems management strategies for acquisition, manufacturing, and procurement
- Systems management strategies for marketing and sales
- Systems management strategies for research, development, test, and evaluation
- Tactical and strategic decision making aids

The major thrust of articles published involves understanding and enhancing use of information management, knowledge management, and systems management for organizational and enterprise improvement. We look forward to receipt of high quality articles in these areas. Please send five copies of original contributions for review purposes to either of the Editors in Chief.

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Andrew P. Sage received the BSEE degree from the Citadel, the SMEE degree from MIT and the Ph.D. from Purdue, the latter in 1960. He received honorary Doctor of Engineering degrees from the University of Waterloo in 1987 and from Dalhousie University in 1997. He has been a faculty member at several universities and, in 1984 he became First American Bank Professor of Information Technology and Engineering at George Mason University and the first Dean of the School of Information Technology and Engineering. In May 1996, he was elected as *Founding Dean Emeritus* of the School and also was appointed a University Professor. He is an elected Fellow of the Institute of Electrical and Electronics Engineers, the American Association for the Advancement of Science, and the International Council on Systems Engineering. He is editor of the John Wiley textbook series on Systems Engineering, and the INCOSE Wiley journal *Systems Engineering*. In 1994 he received the Donald G. Fink Prize from the IEEE, and a Superior Public Service Award, for his service on the CNA Corporation Board of Trustees from the US Secretary of the Navy. His current interests include systems engineering and management efforts in a variety of application areas including systems integration and reengineering.

Bill Rouse is Chief Executive Officer of Enterprise Support Systems. He has served in a variety of leadership roles in other companies and on the faculties of several leading universities. Rouse has written hundreds of technical articles and reports, and has authored many books, including most recently *Don't Jump to Solutions* (Jossey-Bass, 1998), *Start Where You Are* (Jossey-Bass, 1996), *Best Laid Plans* (Prentice-Hall, 1994), *Catalysts for Change* (Wiley, 1993), *Strategies for Innovation* (Wiley, 1992), and *Design for Success* (Wiley, 1991). He edited the eight-volume series *Human/Technology Interaction in Complex Systems* (JAI Press) and is co-editor of the forthcoming *Handbook of Systems Engineering and Management* (Wiley). Rouse is a member of the National Academy of Engineering, a fellow of the Institute of Electrical and Electronics Engineers (IEEE), and a fellow of the Human Factors and Ergonomics Society. He received his B.S. from the University of Rhode Island, and his S.M. and Ph.D. from the Massachusetts Institute of Technology.