

Summary

Mr. Wiig is chairman of Knowledge Research Institute, Inc. provides contract research, consulting and advisory services to assist commercial and public clients achieve durable success through management of knowledge. He focuses on comprehensive knowledge management that integrates creation and leveraging – use – of intellectual capital with all other management functions to make actions by managers and employees at all levels effective in support of enterprise goals. Mr. Wiig has been a technical and management consultant for over 35 years. He specializes in, and is a founder of, the new discipline of “Knowledge Management” and assists clients with implementing and planning new approaches to operate their business with a focus on expertise and professional knowledge, often with the use of advanced technology. Earlier, he was a management consulting partner with Coopers & Lybrand. He was with Arthur D. Little, Inc. for 17 years where he started and led the Policy and Systems Analysis group and later, he created and directed the Applied Artificial Intelligence Center. He has an international reputation for his work in Knowledge Management, applied artificial intelligence, operations management, and planning. He has published five books and over 70 text book chapters and research articles in refereed journals and proceedings.

Background

As a technical and management advisor and consultant, Mr. Wiig has emphasized approaches to assist organizations achieve sustained success and viability. His work has included systems and policy analysis, planning, integrated management practices, effective operations practices in private firms and government organizations, domestically and abroad, and technical computing and process control. He works with Knowledge Management, professional problem solving, decision making, and an application of technology to manage knowledge. As part of these efforts, he focuses on work and management practices in relation to knowledge-intensive work in office and other work environments across industries and businesses and application of modern cognitive sciences to the work environment. His interests include Integrated Enterprise Management which may comprise initiatives such as redesign of incentives, learning organization, and other areas of modern management theories that all require motivational and cultural changes and sophisticated infrastructure for support. He focuses on operational and management practices that lead to effective, intelligent-acting organizations and often to needs to promote collaboration to improve the effectiveness of work. In his work he integrates perspectives and principles from Management Sciences, Systems Sciences, Information Sciences, Cognitive Sciences, and Social Sciences.

Beyond Knowledge Management, Mr. Wiig has extensive experience in conceptualization, planning, and implementation of widely integrated business, technical, and on-line information systems for service organizations, engineering, and manufacturing companies. As an example, he conceived and planned a very large engagement to develop full computer automation of all business and operational areas of the National Oil Company of Saudi Arabia (Petromin). It was his responsibility to define applications in various operational areas, specify integration requirements, and initiate preliminary designs of networks and computer architectures. In this role, he personally

authored several of the Invitation to Bid documents relating to operations, marketing, and planning.

In addition to his work with service and Government organizations, Mr. Wiig has significant industrial experience and technical background in manufacturing and process firms where he also has been personally responsible for direct operation, management, and technical development and planning. He has held staff and line management positions in service and manufacturing organizations. He participated in early applications of process control computers and collaborated with IBM to develop a comprehensive, integrated software system for advanced process control. Before his professional career, he was an hourly employee in shipyards, foundries, and machine shops.

Mr. Wiig holds a B.S. in Mechanical Engineering and an M.S. in Instrumentation Engineering (Control Theory) from Case Institute of Technology and is listed in Marquis' Who's Who in Science, Who's Who in America, Who's Who in the World, and other reference works.

Examples of Engagements and Professional Experience

In 1989, Mr. Wiig started a contract research and consulting practice with focus on the application of Knowledge Management and the aspects of how to implement these concepts in practice based on his own and his associates practical and theoretical work in this area during the previous 30 years. He primarily assists clients plan, implement, and conduct Knowledge Management practices with focus on people, but also work with aspects of advanced information technology to improve decision making and work practices of knowledge workers at all levels. During his consulting career, he has been responsible for work in the following areas where he has:

- **Applied aspects of Knowledge Management to:**

- Undertake a number of assorted engagements ranging from providing presentations to senior managements and boards of directors; advising state governments on knowledge codification, structuring of knowledge and expertise to support training of bureaucrats in specific functions; and participating in international surveys of knowledge management, decision systems, and process control in refineries from the perspective of refinery operation effectiveness.
- Work with client organizations to help develop strategies, plans, and action programs to adopt knowledge management throughout their organizations and integrate it with other management thrusts and initiatives.
- Assist client organizations in North America, Europe, Latin America, and South Africa develop their in-house staffs to become self-sufficient in knowledge management work.
- Provide knowledge management subject-matter expertise for week-long senior management workshops for universities, regional development agencies, and large organizations to educate and assist in the creation of internal KM strategies, programs, and specific implementation plans.

- Support large consulting organizations in planning for their knowledge management practices and in educating their staffs of knowledge management professionals.
- Educate a large financial company in the use of knowledge management-related methods and approaches in support of corporate knowledge management and business process redesign. This was a year-long assignment and included high-level strategic work as well as an apprenticing program that included detailed field and analysis work. Methods for “Scripting and Profiling” of “Knowledge-Intensive Work Functions” were some of the central approaches taught and applied.
- Assist companies in developing shared understandings among all its employees of the importance of knowledge management to the success and viability of both the firm and each employee through the conduction of “knowledge cafés” and continued follow-up discussion and information activities.
- Perform in-depth interviews and knowledge analysis to determine knowledge required for quality decisions, strengths and weaknesses of knowledge flows, and identify knowledge-related bottlenecks and find solutions for how to improve and manage these situations.
- Work with the CEO and board of directors to identify changes in corporate priorities and corporate culture required for effective knowledge use in a multinational service company.
- Create detailed methodologies and work programs for clients to follow in practicing knowledge management.
- Provide week-long and shorter lectures (seminars) for Master of Business Administration university programs.
- Provide advice, seminars, and presentations to senior management teams, middle managers, and professionals on how to manage knowledge.
- Define and study “Decision Information” from managerial and operational perspectives with complementary concerns for associated information systems.
- Assist in developing knowledge management strategies on national levels.
- Act as Subject Matter Expert (SME) for comprehensive multiclient benchmarking studies of best knowledge management practices in the U.S. and Europe.
- Create “Enterprise Intelligence Cultures” within advanced organizations that are adopting knowledge management on a broad basis.
- Design and build a “Knowledge Architecture” as basis for corporate-wide and integrated knowledge management in a high technology service firm.
- Perform a comprehensive survey of Chief Executive Officers in Fortune 500 companies to determine their concerns and priorities on knowledge, expertise, and its management.
- Work with international oil companies to assist them:
 - On the level of Chief Executive Officer and Board of Directors: to establish general approaches for how to manage knowledge and expertise throughout the company.

- On the Chief Information Officer level: to advise on use of advanced information technology to support and integrate their knowledge management program - now - and as the technology and their KM program evolve over the next years.
- On the Dedicated Task Force level: to provide guidance on guidelines, policies, and execution of their knowledge management program and expert system technical and applications approaches.
- Work with a large U.S. engineering company to start up their knowledge management practice with emphasis on building knowledge and appropriate use of knowledge by knowledge workers at all levels. A particular concern is planning the gradual re-engineering of general office work facilitated by modern information technology.
- Assist large U.S. engineering companies to develop their knowledge management approaches, and as initial steps, to develop comprehensive “Skills Inventory Systems” to act as basis for the companies’ product strategy and human resources expansion and enhancement programs.
- Provide knowledge management conceptualizations for a large study of the effectiveness and Management Decision Information in over 100 oil refineries.
- Assist the United States Department of State by providing a series of seminars and radio interviews in Australia on knowledge management for Australian Government institutions and commercial gatherings.

• **Used applied Artificial Intelligence and Decision Sciences for assignments to:**

- Develop expert systems for banks and other financial institutions for *personal financial planning* for middle income level individuals.
- Develop expert systems for support of *equity traders* in Institutional Investor organizations.
- Work with a highly successful, international trader workstation, information publisher, and information refining company to plan for its next generation products and to guide their technical staff in planning re-hosting their workstation and central communications processors into a modern object-oriented, multitasking, and window-oriented environment with migration paths to ISDN and image processing on one hand and hypertext, natural language understanding, and real-time expert systems on the other hand. This work is presently on-going in the U.S. and overseas.
- Assist process and manufacturing companies to start applied AI programs and build their AI implementation teams.
- Develop expert systems for support of *refinery and chemical process operations* and for *discrete manufacturing*.

- Create framework to develop *international crude oil trading strategies* for a major oil company using natural language problem representation with semantic analysis.
 - Provide *project evaluations* and *venture analyses* for oil and utility companies and other industries, including building complex systems for the continued planning for offshore development programs and platform concepts such as in the Norwegian Sea.
 - Develop an interactive advisory system for *analyzing hypotheses of consequences of environmental impacts* for disposal of potentially hazardous materials.
 - Analyze *emergency use of restricted pesticides* to combat unusual threats;
 - *Evaluate proposed projects and programs* for R&D organizations and oil company exploration programs.
 - Assist large and small high technology companies evaluate their AI-related ideas and products and assemble strategies to develop and market them.
- **Provided Decision Making, Problem Solving, and Planning for government and private sector organizations with services such as:**
 - Direct *Master planning and conceptual design* of overall system architecture and applications for all management and operations support systems for a large national oil company. This engagement included automation of management support functions for planning, refinery operation, personnel, supply coordination, marketing, bulk plant automation, accounting, and management information systems. Authored several 'Invitation To Bid' documents and performed vendor evaluation for several of the systems. The system is in final stages of implementation with a total investment over \$1.0 billion.
 - Prepare next generation Air Traffic Control Computer *project master plan* for the Federal Aviation Agency (FAA) encompassing all functional macro tasks for conceptual design through implementation and fielding and included budgeting, legislative, regulatory, and project management decision procedures, procurement activities, subcontracting requirements, etc.
 - Prepare the Energy Research and Development Agency's (ERDA) fossil energy *plan, project schedules, and budget requirements*.
 - **Provided General Management Consulting services such as:**
 - Assisting in developing corporate technology strategies.
 - Providing economic, business, technical, and management analysis of mergers and acquisitions.
 - Analyzing business opportunities for new products.
 - Conducting surveys of executive managements' perspectives on management of knowledge, approaches to financial management, and strategies for research and development.
 - Developing personnel evaluation and compensation procedures for several clients using advanced methods in part borrowed from Knowledge Management.

- Combined **technical and economic feasibility analyses** for oil and gas production from the continental shelf (published as book on The Economics of Offshore Oil and Gas Supplies).
- Provided **Formal Planning Systems** for industrial and government organizations:
 - Designed and implemented the *product refining and marketing planning system* including supply coordination and inventory management for a national oil company.
 - Conceptualized and implemented the *central planning system* for a national telecommunication organization. The final system included planning practices, philosophy, and human resource planning; coordination of planning in all technical and administrative areas, master scheduling and project implementation; and liaison to other ministries and governmental bodies.
 - Developed a *planning framework* to capture and record information on macro projects for societal developments while assessing impacts and risks to society and selected industries.
 - Designed the U.S. Energy R&D Agency's (ERDA) *procurement planning system* including contract selection and review.
 - Designed the central *planning system* for a public utility company including the capacity planning, demand forecasting, customer behavior, and scenario forecasting of multiple economic conditions.
- Developed comprehensive, interactive computer-based models for **Regional Economic/Demographic/Fiscal Impact** assignments.
- Applied **Integrated Computational Frameworks** for problem solving using Mathematical Programming with subsequent implementation in client organizations for situations such as:
 - *Loan portfolio planning* for financial institutions.
 - *Optimal operation* of complex energy distribution systems on company, country, and international bases.
 - *Development of strategic plans* by selection and scheduling of corporate projects and allocation of capital budgets.
- Performed **Mathematical Modeling and Computer Simulation** of:
 - *Energy flows and balances* for several countries and for global scenarios for domestic planning purposes and for determining international logistics opportunities.
 - The *firm, industry markets, economics of mergers, cash flows* in diversified companies, and other organizational systems.
 - *Discrete production lines, refinery processes, stack gas scrubbers, control systems* and other industrial processes.
 - *Tumors, drug effects on tumors, bio-marker synthesis, circulatory system, neural physiology networks* and other physiological systems.

