# Opportunities for AI Applications in Knowledge Management

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**Abstract**

The Controls Group of Johnson Controls has a strong interest in the application of techniques and tools from the Artificial Intelligence (AI) community to its core problems of capturing, preserving, and applying knowledge. One important distinction between Knowledge Management and AI is that the knowledge can be captured, preserved, and applied without the explicit representation needed for expert systems or other performance support systems. Other "delivery vehicles" include expert analyses, documented methodologies, and training. One topic of significant interest to us is the nature of the differences between such approaches and more traditional AI systems, and whether similar methods can be used to develop both.

## Statement of Interest

Johnson Controls has determined that knowledge management will support much of Controls Group's business strategy in the next decade. Each business unit within the group needs to use and to develop knowledge-based applications and tools to support the integration of the individual units. The fundamental problem is to move from an appreciation of knowledge management and related activities as a desirable concept to practical and cost-effective implementations. This process is expected to take years, and will include both short-term application projects and longer-term research efforts.

The Controls Group has tens of thousands of employees worldwide supporting a full range of facilities management services, maintenance, installation, manufacturing, and sales efforts. This workforce is both international and local: programs may be worldwide for a customer in a specific industry, or limited to a single city or region.

Preliminary knowledge management (KM) investigations have highlighted the need for flexible tools to collect information and experiences, organize and filter this highly diverse body, and deliver it in as succinct a form as possible for each application and user.

Supporting this effort will be conventional groupware and document management tools, as well as detailed information and data modeling, but it is expected this will not be sufficient to provide effective knowledge management. A substantial investment in editing and indexing would be required to make the information gathered useful for traditional training and retrieval. Conventional retrieval technology, such as full-text search engines, is not expected to be fully effective in retrieving relevant information. In addition, the time required would guarantee that a significant portion of the assessed knowledge would be out-of-date.

A preferred alternative would be to use AI-based tools in combination with human efforts to organize and assess the body of knowledge. Other techniques such as data mining hold significant promise as worldwide data sources are integrated and made available throughout the company.

Tools drawn from AI for knowledge acquisition, knowledge representation, and knowledge exchange could be adapted to serve Controls Group employees. Technologies which hold promise include constraint languages for design and configuration, concept maps for organizing bodies of knowledge and mediating differences in representation, ontologies and logic systems for knowledge representation and exchange, and natural language methods for generation of documentation and reports.

While the literature is filled with examples of "expert systems" and the AI tools used to develop them, the use of such tools to support *human* knowledge delivery is not as well understood. The transition from traditional expert systems to a more human-based knowledge delivery approach may also require new tools as well. We hope this symposium will demonstrate tools and methods capable of assisting such a change, and will develop a more explicit vision of the next generation of knowledge tools suitable for both human and artificial intelligence applications.