Title: A Critical Review of " Strategies for Implementing Knowledge-Based Systems"-3

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Abstract: A paper titled "Strategies for Implementing Knowledge-Based Systems" is critically reviewed in this individual report

A Critical Review of " Strategies for Implementing Knowledge-Based Systems"-3

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A critical analysis of S. Dutta's "Strategies for Implementing Knowledge-Based Systems"

Paper Overview

Soumitra Dutta's paper "Strategies for Implementing Knowledge-Based Systems" [1] defines a Knowledge-Based System (KBS) as a software application (such as an expert system or a corporate database) that helps an organization effectively manage its knowledge assets.

An organization derives the most value from its knowledge only after it is articulated and diffused throughout the organization. Knowledge assets are managed by 1) identifying and articulating the knowledge, 2) leveraging that into a knowledge network (where it is widely accessible throughout the organization), and then 3) having individuals learn from the knowledge network. "A KBS aims to capture selected articulated aspects of an organization's knowledge assets in an information system. Thus, the development of a KBS results in the creation of a tangible knowledge asset which can be distributed and leveraged within the organization" [1].

Organizational knowledge exists at four levels: individual, group, organizational, and knowledge-link (inter-organizational). Dutta focuses on two of these: individual and organizational. He identifies four knowledge processing strategies that can be defined by the selection of either individual or organizational knowledge, and application of either an individual/dispersed or centralized implementation approach:

Guided,

Specialist,

Dispersed Points, and

Dispersed Clusters.

Dutta discusses the impacts of each of the four identified strategies on management of knowledge and on organizational effectiveness. He then identifies factors that contribute to the decision to select one strategy over another one. These factors are:

- The company's knowledge profile: independent knowledge requirements versus integrated knowledge flows.
- The extent of the company's experience with KBSs.
- The availability and nature of resources (people, capital, and information systems architectures).
- The strategic nature of the desired KBS application (does the organization wish to enhance knowledge within specific activities, transfer knowledge across activities, or reconfigure knowledge flows across the organization).

Methodology

The paper is segmented into five parts:

Part 1 introduces Knowledge-Based Systems, previews the paper, and discusses other literature in the field. It positions this paper within the existing body of related research.

Part 2 gives a technical overview of knowledge as an organizational asset and the use of KBSs to manage that asset.

Part 3 identifies four specific knowledge-processing strategies that can be used to implement a KBS.

Part 4 discusses the implications of each strategy and identifies the factors that affect the choice of a strategy.

Part 5 concludes with a brief reiteration of what the paper has contributed and ideas for further study.

In development of its ideas, the paper discusses several existing knowledge-based systems applied in various settings: American Express's Authorizer's Assistant, Digital Equipment Corporation's VAX-based knowledge network, and Coopers and Lybrand's ExperTax.

Contributions

Dutta surveys the extensive recent literature on knowledge-based systems. Some articles describe the technological issues involved in KBS implementation, while others address the strategic issues related to use of a KBS within an organization. The previous strategy research has focused on the decision of whether to implement a KBS. In contrast, this article identifies specific types of implementations and discusses the strategic implications of selecting one implementation type over another.

Dutta asserts that his paper contributes to the current research literature in two ways. It:

1) Extends discussions of strategic management from a resource-based view of the firm by focusing specifically on the role of IT systems in effectively supporting the management of knowledge assets.

2) Extends discussions of the organizational implications of implementing KBSs by adopting the perspective of knowledge-asset management.

Strengths

The paper is extremely well organized. Dutta does a good job of positioning the paper within the body of KBS writing. He thoroughly develops the topic. Each idea follows logically and with little effort from the last.

Another particular strength is that this article identifies papers that discuss other aspects of the topic, both technical and strategic. As one example, "Brainpower" by Thomas A. Stewart provides rationale for implementing a KBS:

> "Most companies are filled with intelligence, but too much of it resides in the computer whiz who speaks a mile a minute in no known language, in the brash account manager who racks up great numbers but has alienated everyone, or in files moved to the basement. Or it's retired and gone fishing. The challenge is to capture, capitalize, and leverage this free-floating brainpower"[2].

This statement accurately identifies the problem I see in my software work—there is no shortage of distributed knowledge; the difficulty is articulating and disseminating it. This example demonstrates how Dutta's extensive references allow me to find other KBS information that is of particular interest to my job.

You need more elaboration here.

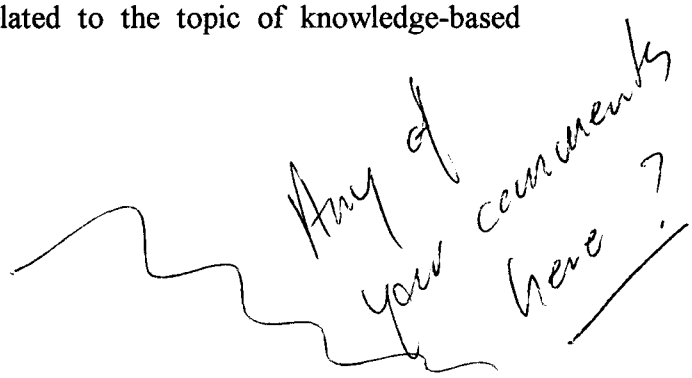
Weaknesses

One small weakness is the inaccuracy of the references included. For example, I attempted to locate the following reference but was unable to do so. It was not in the specified volume of the *Strategic Management Journal.*

G. P. Pisano, "Knowledge, integration, and the locus of learning: An empirical analysis of process development," *Strategic Manage. J.*, vol. 15, pp. 85-100, 1994.

Volume 15, February, 1994, page 85 of the *Strategic Management Journal* instead contains an article entitled "Competitive Attack, Retaliation and Performance: An Expectancy-Valence Framework." This is unrelated to the topic of knowledge-based systems.

Conclusions



The paper's conclusions are:

1) A set of four identified strategies for implementation of a knowledge-based system,
2) A discussion of the implications of each of these strategies, and
3) Identification of factors which should be considered in selecting one of the four strategies.

These conclusions are well stated and logically developed. They are supported by reference to several existing knowledge-based systems.

Further Study

Dutta's *dispersed points* strategy is potentially useful to Pretty Good Programmers for organizing our software process and application domain knowledge. This strategy combines the knowledge realm of the individual with implementation by the individual. Implementation is low-cost. Starting with this strategy, I would like to research specific KBS tools and techniques other companies use to manage their knowledge assets.

References

[1] S. Dutta, "Strategies for Implementing Knowledge-Based Systems," *IEEE Trans. Eng. Manage.*, Vol. 44, pp. 79-90, February 1997.

[2] T. A. Steward, "Brainpower," *Fortune*, pp. 44-60, June 3, 1991.

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