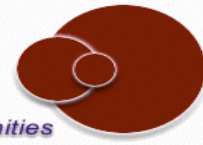


KTweb

Connecting Knowledge Technology Communities



The New Knowledge Management, The Open Enterprise, and Knowledge Technology

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What is Knowledge Technology?

In my first article, I described the components of The New Knowledge Management (TNKM), and the problems they address. Now it's time to ask: What is Knowledge Technology (KT) and how can it contribute to TNKM?

First, I'll begin by stating that KT itself is that which contributes to knowledge processing and KM and that both of these are in great part self-organizing social processes. So, KT must enhance and enable these processes rather than working against or undermining them. This suggests that those who design and implement KT applications must both understand these social processes and be able to assess the likely impact on them of implementing such applications. This, in turn, immediately suggests a need for knowledge meta-technology that can improve our ability to assess the impact on knowledge processing and KM of introducing knowledge technologies. Keeping in mind my earlier article, it also suggests that an intended KT application supports knowledge processing and KM to the extent that its **use cases** support the 8 sub-processes of knowledge production and integration, and the 9 KM processes I distinguished there.

Second, let's recognize that KT may or may not exist to support a particular aspect of a particular knowledge sub-process or KM activity. Further, if such technology does exist, it may or not be integrated in an organization's enterprise wide architecture. The enterprise portal has become the interface of choice for knowledge workers in large organizations accessing particular applications. As a result, portal applications are evolving into Distributed Information Management Systems (DIMs), in which the portal front end is only the interface in a much more comprehensive enterprise-wide application. I've discussed the architecture of such applications at length in my book (Firestone, 2003, Chs. 5, 6, 10, and 11). In the following comments, when I say that KT makes or fails to make a contribution in a particular area, I'm referring to the presence or absence of such technology, existing or not yet existing, **in the organization's portal system architecture** (viewed as a comprehensive system including web services, middle-tier application servers and back-end content and data sources).

Third, KT and Information Technology (IT) are not generally distinct. And when they are not, our use of the term "KT" is a matter of choice, and is not required by the characteristics of the application. We can see this by reflecting on the Knowledge Life Cycle (KLC) and KM sub-process categories, named in my first article. Information acquisition can contribute either to knowledge making or to gathering information. The outcome of knowledge claim formulation is information, not knowledge, and every activity producing knowledge claims may be seen as an information producing or processing activity or as a knowledge processing activity. Knowledge and information broadcasting is only different from information broadcasting because some of what is broadcast by the technology application in question is knowledge, **provided that organizational knowledge has been produced previously in the KLC**. Analogous points may

be made about the other knowledge integration sub-processes: searching and retrieving knowledge, knowledge sharing and teaching. All of these sub-processes integrate knowledge only if knowledge has been previously produced in the KLC. Otherwise whether they integrate knowledge and information or only information is unknown.

Similar points may be made about “KT” designed to support KM. Are technology applications designed to support symbolic representation, building external relationships, leadership, management-level knowledge production and integration, crisis handling, changing processing rules, resource allocation, and negotiation, distinct for Information Management (IM) and KM? With the exception of management-level knowledge production it is hard to visualize where the differences are.

Fourth, when is KT distinct from IT? I think the answer is only when it supports a sub-process that can produce something more than “just information,” or when it can distinguish knowledge from information in the outcome of such a process. The only applications that are distinctly KT therefore, are those applications that support knowledge claim evaluation, individual and group learning, KM-level knowledge production, and the Distributed Organizational Knowledge Base (DOKB), the collection of belief and artifact-based knowledge in the organization.

KT in Knowledge Processing

Contributions to knowledge production: KT is important for information acquisition (searching out and retrieving information external to one’s organization). Since searching for and retrieving existing knowledge claims is important in both formulating new claims and in testing them, search and retrieval technology (including category formation and taxonomy generation, automated classification, text mining, and semantic networking) is also important for individual and group learning, knowledge claim formulation and knowledge claim evaluation. KT can also help with the above sub-processes through the support it provides for expertise location and collaborative activities supporting individuals, teams, groups, and CoPs.

Another advance in KT for knowledge production has occurred in the area of individual learning. Here we have begun to see the appearance of Learning Content Management Systems (LCMSs) in support of on-the-job problem solving.

Support needed for knowledge production: Portals do not currently support automated learning as an assist to human learning. There is no support for: intelligent agent-based learning; aggregation of knowledge claims input into the portal system by individuals into team, group, or system level knowledge claims; or partially automated organizational level learning. In addition, current enterprise portal systems do not generally incorporate (1) prioritization, (2) Knowledge Discovery in Databases/Data Mining, (3) analytical modeling and computer simulation tools, (4) best practices capture software, or (5) other software targeted on knowledge claim formulation, such as software supporting abduction, and analogical reasoning. All of these technologies exist either as standalone applications, or in the form of academic research results. But they are generally not integrated into portals yet.

Portal systems also don’t support knowledge claim evaluation in any specific way. This is where KT contributions are most needed. This sub-process is the gateway to organizational knowledge and the means to distinguish knowledge from information. Current KT and portal-based systems provide no recognition that knowledge claim evaluation is important in knowledge production. In my recent survey of 23 leading portal vendors (Firestone 2003, Chapters 14-17), I found that there was:

- No focus on knowledge claim evaluation criteria and frameworks in applications, or on change in these
- No focus on knowledge claim evaluation modeling or decision making

- No automated support for testing competing knowledge claims in knowledge production
- No tracking of results and history of knowledge claim evaluation in the enterprise
- No ratings of competing knowledge claims
- No specific support for collaborative knowledge claim evaluation
- And further, in spite of claims from a number of vendors that they are selling a knowledge portal, not a single one supports specific knowledge claim evaluation functionality

A consequence of the failure to provide such support is that portal systems and KT, more generally, provides no support for systematic, fair comparison (See Firestone and McElroy, 2003, Ch. 5) of competing knowledge claims.

Contributions to knowledge integration: Here search and retrieval technology continues to be important, along with collaborative applications used for knowledge sharing. In addition, Learning Management Systems (LMSs), and to a lesser extent, the LCMSs I've already mentioned, provide support for teaching. User/friendly publication applications are important for knowledge and information broadcasting.

The key point to remember about technology for knowledge integration, once again, is that it overlaps entirely with what is necessary for information integration. So even though it is important for supporting knowledge processing, the technology is not distinctly KT, as opposed to IT.

Support needed for knowledge integration: Further improvements are needed in search and retrieval technology and are continually occurring. In addition, collaborative technology must be greatly improved in the area of real-time synchronous collaboration for facilitating interaction and knowledge sharing. Finally, LMSs and LCMSs need to be greatly improved to support teaching.

Contributions to the DOKB: Current technology supports information and databases both structured and unstructured. The development of XML technology provides an increasing ability to structure unstructured information for later navigation and retrieval, and also to express and facilitate tracking the performance record of knowledge claims.

Support needed for the DOKB: In TNKM, the DOKB should store the record of performance of knowledge claims against competing alternatives, (the meta-information about knowledge) and therefore provide a basis for distinguishing knowledge from information. But currently, KT doesn't provide support for classifying knowledge claims into Falsified, Surviving, and Undecided categories (See Figure 3 of the previous article). This is the "bottom line" regarding support for identifying knowledge production outcomes in portals. Currently, despite all the marketing rhetoric, no so-called Enterprise Knowledge Portal (EKP) products provide a way to distinguish knowledge from "just information." So, for all the talk of "knowledge bases," as distinct from databases, and for all the talk of portals being the "killer app" of KM, there is not yet a single portal product that can implement the distinction, at the heart of KM, between information and knowledge.

KT in Knowledge Management Processing

Contributions to Knowledge Management sub-processes and additional needs: Insofar as KM leadership involves exercise of interpersonal communication activities, portals support it well. In addition, they can also support hiring functions if HR applications and recruiting applications are integrated as portlets. Some have reported development of incentive systems for portal solutions (e.g. at EDS), but portal vendors generally don't offer this as a capability.

As B2B eBusiness and collaborative commerce capabilities have developed, more powerful applications for supporting development of interpersonal relationships have been included in

portal systems. Today, the capability to develop external relationships through collaborative applications of various kinds is comparable to the support provided for developing internal relationships.

KLCs exist for knowledge managers as well as knowledge workers. The support provided by portals for the sub-processes of the KLC therefore, applies at the KM level as well as at the business process level. The need I described earlier for additional support for the sub-processes of the KLC applies here as well.

Portal systems provide mixed levels of support for changing knowledge processing rules. They provide support for broadcasting and communicating changes in knowledge processing rules to knowledge workers. Developing new rules is a matter of KM-level knowledge production and knowledge integration, however, and our previous remarks on portal support for these knowledge processes, in general, apply at the KM level as well. Also, enterprise portals do not provide support for incentive systems that may help to implement changes in knowledge processing rules.

Crisis handling uses activities belonging to other KM sub-process categories. So it is supported precisely to the degree other categories are supported. KM resource allocation requires the presence of analytical modeling and simulation tools for supporting resource allocation in portals. These tools may be easily integrated through portlets. But products that call themselves EKPs do not generally provide support for such activities. Finally, support for negotiation with other managers is provided by general portal communication and publication capabilities, but no specific applications targeted on supporting negotiations are available.

The Open Enterprise, KT, and the Enterprise Knowledge Portal

The goal of KM is achieving and maintaining sustainable innovation in knowledge processing. Organizations need “openness” in knowledge processing, including openness in all sub-processes of the KLC to make this happen. TNKM’s normative model providing openness is the ‘Open Enterprise’ (OE) (Firestone and McElroy, 2003, 2003a), an application of Karl Popper’s “Open Society” (1945, 1945a, 1963, 1972) ideas to the problems of knowledge processing in the enterprise.

In TNKM, ***the OE is a normative model of a type of enterprise in which recognizing problems, formulating knowledge claims and testing and evaluating them on a continuing basis are processes open to all stakeholders***, and transparency, trust, epistemic inclusiveness, and other correlates and outcomes of openness prevail. In the OE, knowledge claims become organizational knowledge, regardless of their source, only if they survive tests and evaluations through fair comparison of competing knowledge claims. Truth is not what management says it is. Instead, it is something we can approach, and perhaps even attain. But we can never be certain that we have attained it, and we must therefore remain open to criticism of our most cherished ideas and knowledge claims, and must, as Peirce said, never “block the way of inquiry”.

The idea that justification criteria for knowledge should flow from the top, is a recipe for more Enrons and Global Crossings, rather than for organizational success. Instead, we must recognize that there are no criteria for justification, but only critical arguments that allow us to choose among knowledge claims in efforts at problem solving.

This is not to say that management should be democratic in the OE. There is a distinction between operational decision-making and knowledge processing in organizations. In the OE, managers have authority in operational business processing and use whatever knowledge suits them in decision making. But knowledge processing is transparent and inclusive and “openness” is a fiduciary duty, protected by the Board of Directors, and further embodied in the designation of CKOs as directly responsible to the Board rather than to the CEO.

The OE needs a KT application that will support openness in KLC and KM processes. Current KT can make stored information available to all knowledge workers. It can make available many applications to support knowledge claim formulation. It can integrate various applications to support many of the KM sub-processes. It can support teaching and knowledge sharing and the other knowledge integration sub-processes. It can integrate all this and more within a comprehensive enterprise portal systems architecture. But it cannot yet provide what knowledge claim evaluation in the OE needs – free knowledge worker access to the track record of past performance of competing knowledge claims for purposes of continuous testing and evaluation, and support for fair comparison of competing knowledge claims in the KT application itself.

These needs, and others mentioned earlier, can only be fulfilled by an Enterprise Knowledge Portal (EKP) application. Not the sort of EKP described in some of the literature on this subject (see, for example, Collins, 2003). But the EKP I've specified in detail in the first published paper on this subject (Firestone, 1999), in other articles (Firestone, 1999a, 2000, 2000a), and in my recent book on portal systems (Firestone, 2003, See especially Chs. 5, 6, 10-11, and 13). That EKP system integrates data, information, and knowledge claims, and also meta-information or meta-knowledge claims about these. By providing unrestricted access to both knowledge claims and meta-claims, and by providing such access to a system supporting (a) producing high quality and relevant knowledge claims, and then (b) testing, fairly comparing, and evaluating them, the EKP enables openness in knowledge claim evaluation. That openness is not provided by today's information portals or by its so-called "knowledge portals".

The extent to which a portal product or solution is an EKP depends on the knowledge processing and KM use cases it supports!

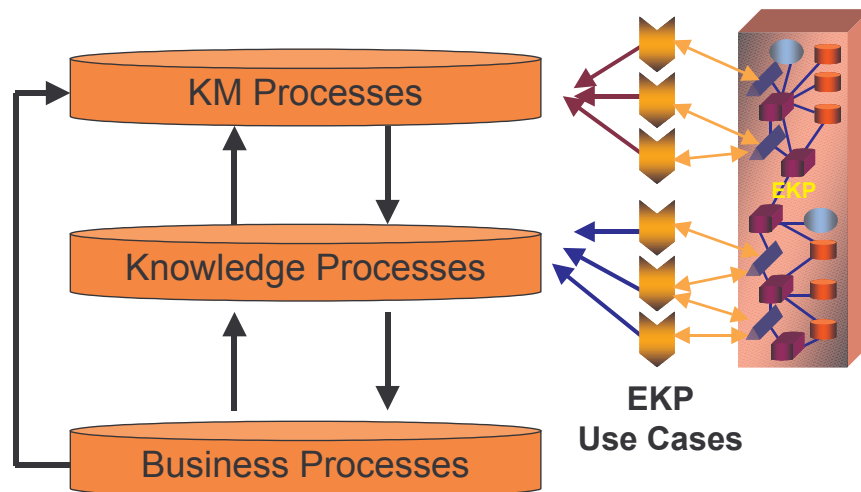


Figure 1 -- Knowledge and KM Processes and the EKP

Conclusion: An Assessment of KT Contributions

My review of KT support for various KLC and KM categories of the TNKM framework provides a view of the gap between the current state of KT and portal system progress and what is needed for a comprehensive KT application. That is, one that would provide across-the-board support for

all knowledge processing and KM sub-processes -- a true EKP (See Figure 1). Specifically, current portals provide support only for those sub-processes that are common to KM and information processing and information management. They don't support individual and group learning, knowledge claim formulation, knowledge claim evaluation, knowledge outcomes, the DOKB; or KM knowledge processing, resource allocation, or negotiation very well.

The most glaring departure from TNKM requirements is in the area of knowledge claim evaluation. Here, current KT and portal systems provide almost no support, and the idea of providing it is apparently not even on the radar screen of portal implementors. Perhaps that will change. But, in my view, the heart of KT, support for knowledge claim evaluation, remains largely undeveloped. And we are still probably years away from a true EKP (See Firestone, 2003, for requirements) that would provide support for the Open Enterprise, with its strong requirement for continuous testing and evaluation of competing knowledge claims within a fair comparison framework. Until we get there, the term Knowledge Technology will represent a promissory note, rather than a reality.

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