

Developing a Knowledge Management Portal

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INTRODUCTION

Knowledge management has been heralded as an important component of a successful business strategy, yet how does a company implement a knowledge management (KM) strategy that provides a return? Since the advent of KM, the academic literature and practitioner's guides have been awash with KM strategies that guarantee substantial economic returns. Unfortunately, these KM systems also require a substantial initial investment, and hence it is becoming increasingly difficult to justify expenditure on knowledge-based activities (Ellinger, Ellinger, Yang, & Howton, 2002). Academic research has shown that knowledge is the main asset of an organisation and provides the sole means by which an organisation can innovate to create a sustainable competitive advantage (Kandampully, 2002). The pharmaceutical industry is a prominent example of such a knowledge driven environment, where the complex processes of drug development are viewed by many to be an ideal environment in which to derive tangible value from the adoption of a knowledge management strategy (Gunnlaugsdottir, 2003). An example of a successful knowledge management strategy is often focused upon the introduction of a knowledge management Portal or company intranet. One widely cited example is the case of Buckman Laboratories, where an electronic database and discussion forum was implemented in 1992. The portal allowed staff to access the stored information of the organisation and employee knowledge across the company, and this system was purported to have led to a 21% increase in sales of new products (O'Dell & Jackson Grayson, 1998). Cases such as these provide compelling evidence that the adoption of a knowledge management based portal is a financially sound judgement, yet what constitutes a knowledge management portal and what should a knowledge management practitioner provide employees and ensure a return on investment?

The following article addresses the strategy and tools required to aid knowledge transfer within innovative organisations and draws inspiration directly from a knowledge management strategy within a large pharmaceutical organisation. The article discusses and recommends the

functionality and components that are required within a knowledge management portal and the functionality that may be required in the future. The article then concludes with recommendations a practitioner should consider when implementing a knowledge management portal.

BACKGROUND

This article has evolved from a three-year qualitative case study based upon the analysis of the knowledge sources utilised by key innovators within the R&D wing of a multinational pharmaceutical organisation. A total of 32 qualitative case studies, based upon a research methodology suggested by Yin (1989) and Gable (1994), were conducted within the R&D wing of the organisation and focused specifically on the knowledge activities of the individuals involved within drug discovery and innovation. The R&D wing of the company employs approximately 10,000 personnel and is responsible for the progression of novel chemical compounds to candidate drugs. The case study research found that this process occurs through the application of the knowledge and expertise of the employees, who must make informed and reliable decisions on the problems associated with the development of viable drugs. Knowledge management has long been associated with the generation, codification, and transfer of such knowledge (Ruggles, 1997) and in order to address these areas, the organisation developed a long term knowledge management strategy, based upon an R&D Portal, to meet the knowledge needs of the employees involved within these drug development processes. However, the case study research and user surveys have shown that in its current guise, the R&D portal is failing to meet the knowledge needs of the employees in a number of areas. Rather than the knowledge rich environment that the organisation originally intended, the employees view the portal as a repository of information regarding company strategy and not as the rich repository of drug development knowledge.

In an ideal scenario, a knowledge management portal should offer a rich and complex shared information work-

space for the creation, exchange, retention, and reuse of knowledge (Benbya, Passiante, & Belbal, 2004). The case study analysis reveals that the implemented R&D portal is far from achieving this optimal goal, and although the R&D portal provides a gateway to the company's vast repositories of information and intranet based knowledge, it fails to provide sufficient basis for knowledge creation and exchange between employees. The case study findings concluded that few drug innovations actually stemmed from the knowledge and information residing within the R&D portal. Instead, pharmaceutical innovation was found to be reliant upon collaboration occurring in-house between fellow colleagues and collaboration with external contacts and research institutions. Together, these collaborations drive the allied processes of knowledge creation and exchange and spark innovation. The development of relationships, knowledge networks, and communities of practice (CoP) is central to drug development, and a new knowledge management portal is now being used as a gateway with which to encourage innovation through the development of such social interactions. Although collaboration is the driving force behind innovation, a more surprising aspect of the research revealed that chance and luck play a key role in the formation of these collaborative networks. The spontaneous nature of innovative communities of practice can never be managed or predicted, but the strategy outlined within the article may aid the formation of these informal networks and confer a greater chance of innovative work occurring. The following sections detail the key functionality which is now being introduced to allow the existing portal to function above its present role as an information and knowledge store, and instead serve as a collaborative and social environment that is conducive to the promotion of innovation and social interactions.

A KNOWLEDGE MANAGEMENT TOOL KIT

Creating a Semantic Framework

The studied organisation is typical of many international companies in that a number of large databases and information stores are spread out in a disorganised array across the company. Due to issues of duplicated data and poor functionality, the authors discovered that the current information stores were rarely used for innovation. The R&D portal was originally introduced to partly solve these problems and create an open environment of work, in the hope of prompting innovation. However, in order to successfully implement a knowledge management portal, the organisation has had to introduce an architecture and framework that supports knowledge capture, searching, and collaboration over a variety of knowledge management systems and the framework has been provided by using the Semantic Web and XML.

The Semantic Web is a concept that creates a framework around information and knowledge stores and is rapidly gaining acceptance as a credible knowledge and information retrieval approach (McGuinness, 2002). The Semantic Web is reliant upon the use of ontologies to create this logical framework and this process provides a backbone to a knowledge management portal implementation. The use of an ontology infers cognitive reasoning and structure between domain specific terminology and the elucidation of the relationships between these concepts. Ontologies are tailored to capture the domain specific terminology within the various arenas of drug development across the company and these are currently developed using KAON (<http://kaon.semanticweb.org/>) and BioWisdom technology (<http://www.biowisdom.com/>). Synonyms, drug related terminology, company specific terms, and generic drug terms are mapped into the ontologies and this allows the representation, retrieval, processing, and indexing of the knowledge contained within the portal. An autonomy (www.autonomy.com) based searching system interlinked with the ontologies is utilised to search the information and knowledge stores, while XML has been chosen as the storage format of the portal due to the open nature of the format (Cook, 2000). This allows a variety of information to be captured in accordance with the organisation's information schema and in line with work by Anagnostakis, Tzima, Sakellaris, Fotiadis, & Likas (2005). XML essentially serves as a wrapper for the information within the portal and the ontology provides a flexible method of mapping and retrieving the semantic information. Utilising a semantic model such as the one described, with the addition of RDF metadata tags, maximises the chance of relevant knowledge and information retrieval, which leads to innovation. With the knowledge framework established, the subsequent implementation of collaborative tools within the R&D portal framework, such as forum-based communities of practice, expert location systems, and knowledge mapping software, offers a high return on innovative performance. These individual systems will now be examined in greater detail and their impact on innovation considered in light of the case study results.

The Community of Practice

A principle and highly valued means of achieving valuable collaboration is through the development and use of a community of practice. In its simplest guise, a CoP may be based on the provision of a discussion forum or bulletin board. Topics and questions relating to drug project work are posted to a forum and fellow employees post replies to discuss the questions posed. This approach is widely adopted (Wenger & Snyder, 2000) and basic forum software is freely available (<http://www.phpbb.com/>).

The organisation's R&D portal currently uses a software tool called eRoom. This is used to capture and display the

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