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INFOSYS: MEETING THE KNOWLEDGE MANAGEMENT CHALLENGE¹

Dr. J. K. Suresh, Vice President and Principal Knowledge Manager at Infosys Limited (Infosys), pondered a question that continually needed to be addressed, but never could be truly answered. For a number of years, he had been responsible for overseeing the internal knowledge management (KM) activities of the large, global IT-services company, headquartered in Bangalore, India. The existing system was widely recognized—in case studies, articles and books—for its excellence. But the company, whose revenues for FY 2013 were in excess of \$7 billion, was evolving rapidly in its business model. What changes to the KM system, if any, would improve the company's ability to move its services to the next level?

The particular challenge of greatest long term interest was presented by the company's Products, Platforms, and Solutions (PP&S) operations, seen by many at Infosys as being crucial to the firm's long term prosperity. Margins on the offshoring of support and routine development activities—the business that had been the bread-and-butter of Infosys as it grew—were becoming narrower, squeezed both by increasing competition and by rising personnel costs in countries like India. An important remedy to this pressure was to develop software products that the company could sell to its customers as part of a larger package, building an asset category that did go home every night. For KM to benefit these PP&S activities, however, a substantially different focus would likely be required. Traditionally, KM at Infosys had been inward focus, facilitating the exchange of code and experience between the company's employees, currently numbering over 150,000. Where KM could be of greatest help to PP&S, would be in looking outward—e.g., identifying market trends and desirable features, capturing customer experiences, developing sales strategies, finding market niches. Could a system that was designed principally for internal use later be modified for these purposes? Or would it make more sense to build a new system from the ground up? And what might such a system look like?

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Knowledge Management

Organizations have always kept records of their activities. These have served two important purposes: to meet the requirements of external agencies (such as the tax collector) and to serve as reference for subsequent activities. For the latter purpose, organizations have also depended heavily on the past experience of their employees: an invaluable resource and one that was easy to access in a small organization.

Starting in the 1950s and accelerating in the 1970s, three forces made it imperative that companies begin thinking about these records of past activities in a more systematic way. The first trend was automation, which meant that an increasing proportion of the records were being stored online. The second trend was a fundamental change in the nature of organizations and the global economy. Enabled by growth in information and communications technology (ICT), organizations could become larger, more global in their activities, and more distributed in their presence. The third trend was the emergence of the knowledge worker. Until the 20th century, the vast majority of work consisted of repetitive activities that depended upon skills acquired through practice and observation, rather than through instruction. As energy became universally available in the developed world (primarily through electrification) and machines became more capable, the role of the human worker changed (e.g., tractors and harvesters transformed farming, automated assembly lines dramatically reduced labor inputs into manufacturing, computers fundamentally altered the nature of bookkeeping, and so forth). To add value, the worker increasingly needed to add value through the flexible application of knowledge to different situations. Knowledge intensive professions such as consulting, management, law, medicine, engineering, and academia blossomed. Management researchers such as Peter Drucker referred to this group as knowledge workers and predicted that they would quickly come to dominate the workforce.

In their book *Ten Steps to Maturity in Knowledge Management* (Oxford, U.K: Chandos, 2006), J. K. Suresh and Kavi Mahesh identify two important developments as being instrumental in the emergence of KM: (1) the recognition that knowledge had changed from being a *public good* (a commodity that, once created, was freely available to all) to a *positional good* (a valuable asset that could be a source of competitive advantage), and (2) the *death of distance*. They describe the evolution as follows (p. 7):

Over the last few decades, organizations have responded to these developments through various mechanisms to create multiple channels for enabling and managing knowledge exchange. A central feature of these efforts is the creation of an environment that stokes the imagination, the creativity and the sense of belonging and purpose of the individual through an organizational culture which acknowledges and promotes knowledge sharing practices as the primary enablers for value creation. A strong emphasis on networking and communication among employees, rigorous process adoption, progressive human resources (HR) practices, collaborative problem-solving and the like has provided additional impetus for these efforts. These measures have come together under the rubric of what is today termed knowledge management (KM).

Distribution of Knowledge

In considering the nature of knowledge management, it is useful to first consider *where* the type of knowledge to be accessed might be located. As illustrated in Exhibit 1, we may look at this in terms of two dimensions:

1. *Internal* to the organization vs. *external* to the organization
2. *Stored* knowledge vs. knowledge of *who to ask*

For internal stored knowledge, the organization may be able to exert considerable control of how the knowledge is stored (e.g., formatting, indexing) and who has access to it. For external knowledge, such control is generally not available. Thus, the “knowledge” may consist of approaches that may be used for ferreting out what is needed through search and the awareness of the types and quality of sources that may be available.

On the “who to ask” side, the distinction between external and internal sources maybe somewhat less clear cut. Internal sources would normally be employees, while external sources could include individuals/professionals with whom the firm has existing relationships, for example, many technology companies, such as Microsoft, IBM, Oracle, and product companies, such as Verity, Novell had a relationship for enabling Infosys solutions to customers over their own technologies or products. Other external sources included consultants, researchers, suppliers, and customers.

Elements of KM System

There is no standard architecture for a knowledge management system. Rather than describing a specific system, Exhibit 2 illustrates some of the typical components that might be encountered in a typical KM architecture.

Repositories: These are collections of data. They might include databases specifically developed for the KM system, general databases of information developed for other purposes (such as engineering databases that include diagrams or code, searchable email databases, and scanned documents), and paper filing systems.

Contact databases: Databases specifically intended to hold information about people. These databases could be separated for internal and external contacts, or might be combined.

Portal: A server intended to supply unified access to all the resources of the KM system. Such a portal would provide the user with access to these resources without needing to know the details of how and where they are stored. Often, the portal will also provide access to external resources, such as commercial databases and search on the Internet.

Metadata database: The heart of a typical KM, this database contains information about the types of data stored in the various repositories and databases spread throughout the system as well as index information intended to classify each piece of data. A project database, for example, might have metadata tags describing the characteristics of each project (e.g., type of project, keywords, dates completed, responsible department, and technologies employed). A contact database might include metadata information on the type of contact, the specific skills of the individual, and so forth. Metadata for external data sources might include URL information, translation information to format the query, tags describing the type of information available and, frequently, some rating reflecting the quality of information that can generally be expected when consulting the source.

One of the principal challenges of building a successful KM system is choosing an appropriate format for metadata and ensuring that that internal information is acquired and cataloged. This process requires considerable discipline and, if not performed rigorously, can lead to a system where useful knowledge cannot be located. An international non-profit organization, the Dublin Core Metadata Initiative (DCMI), had attempted to establish broad voluntary standards for the design of metadata, as illustrated in Exhibit 3. While a useful starting point, the generality required to achieve broad applicability meant that a considerable amount of tailoring and extension was required to make them useful in a local context.

The dynamic nature of the generation of new knowledge (as well as the rapid obsolescence of the old) also meant that metadata and navigational schemes needed to undergo periodic change. As Dr. Suresh pointed out, this could entail:

creating a much broader range of metadata than for example, the Dublin Core requires, or in recategorizing and reclassifying taxonomies or ontologies to provide continued access to old and new information bridging the terminological changes that affect the field.

Infosys Limited

Infosys Limited, headquartered in Bangalore, India, was a global company engaged in consulting, technology, and outsourcing. Its revenues in 2012-2013 topped \$7 billion. The company's global footprint included 66 offices and 69 development centers in countries such as US, India, UK, China, Australia, Mexico, France, and Germany, to name just some. When the company was founded in 1981, it had seven employees and capitalization of \$250 (in its founder's pocket). As of September 30, 2012, Infosys and its subsidiaries had over 150,000 employees. The overview from the company's website is presented as Exhibit 4, a timeline presenting its history is provided in Exhibit 5.

Evolving Business Model

For its first few decades, the company's bread and butter had been back office jobs and routine programming activities that could be readily sent offshore. It had a number of advantages in competing for such business:

1. Global demand for programming, web design, and back-office services was exploding during this period, a time during which both the Internet boom and, especially, concerns about Y2K² created a situation where demand for programming far outstripped supply.
2. India was graduating many more software engineers than the U.S. and these individuals were paid a small fraction of what it cost to hire a comparable programmer in the U.S.
3. Infosys had, from its early days, instilled a culture of "customer delight" within its organization and had built an unparalleled reputation as a service provider and employer.

In the ten years that followed, global conditions and technology developments forced the company to rethink its business model on a continuing basis. The wage differential for programmers between India and the U.S. was narrowing, particularly when the costs associated with managing an offshore relationship were considered. The demand for routine programming was less robust than it had been in the 1990s. Finally, other countries were beginning to compete for routine business at lower wage rates. While Infosys could address the last of these by opening sites in these other countries, the margins were decidedly lower than they had been in the 1990s. All of these led to considerable pessimism regarding the long term future of the business model. To quote a recent article from *The Economist*:

² Y2K refers to concerns that much of the software written from the 1950s through the 1980s would stop working when the year 2000 arrived, as many programmers had used 2 digit codes to represent the year, a space-saving measure that could potentially spawn untold errors when the year switched from (19)99 to (20)00. To address this concern, many companies either replaced their enterprise software or hired programmers to go through their existing code line-by-line.

Heckett, a Florida-based firm that advises companies on outsourcing...predicts that the migration of services to India and to other offshore locations such as China and Brazil will slow down after 2014 and stop entirely by 2022.

The main reason for this startling prediction is that most of the easily offshorable jobs have already gone. Pralay Das, an equity analyst in Mumbai, estimates that American and European banks and financial-services firms have already off-shored about 80% of what they can reasonably send to India and other offshore locations.

A second reason is that a lot of the jobs that might have been offshored by Western firms in the coming years have already been wiped out by productivity improvements. New jobs in Western economies tend to be of a more demanding, higher-level kind and are less likely to be sent abroad.

All this has sent the Indian IT and BPO [business process outsourcing] into a funk... KPMG, a global consulting firm, even announced "The Death of Outsourcing" in a research paper last year. ("India's outsourcing business," 2013)

While the situation was far from desperate at Infosys, there was a general recognition within the company that if it was to continue its solid growth trajectory, it would need to emphasize activities at the higher end of the value chain. Towards this goal, the company developed a substantial IT consulting practice. It also began to move into the area of Products, Platforms, and Solutions (PP&S).

Infosys Products and Platforms

The PP&S operations of Infosys focused on developing and selling both application software suites (see Exhibit 6) and server-based platforms (Exhibit 7) for activities such as customer management and social networking.

From a technical standpoint, these products and platforms were constructed using a skill-set similar to that applied to client projects for many years. From a business standpoint, however, they differed in two very important ways:

1. On the positive side, unlike their developers and consultants, the PP&S assets did not always wear shoes. As such, they offered margins that were far higher than could be obtained for services contracted on a per-hour or per-job basis.
2. On the less positive side, whereas a customer project guaranteed a revenue stream and had a clear deliverable, designing a successful application was considerably more risky. It required detailed knowledge of the potential marketplace, experience dealing with customers, and a clear sense of the of global IT trends.

For the second of these, leveraging the company's existing knowledge and building a broader base of marketplace knowledge seemed like a natural goal for the company's KM organization. The question became one of whether the existing portal-based KM system was the right tool for the job, or could it be altered to serve that purpose.

KM at Infosys

As an organization engaged in the consulting, technology, and outsourcing business space, Infosys had recognized very early on that it needed to invest in organization-wide knowledge management (KM) assets and practices. While Infosys was growing at a rapid pace as IT outsourcing across the world grew,

it pioneered its global delivery model (GDM). Under this model, Infosys project team members were distributed at client sites as well at offshore Infosys software development centers worldwide. This distribution, along with a rapidly changing technology landscape, posed a challenge for Infosys in terms of maintaining currency of knowledge and skills among its employee base. In response to this, Infosys set up a formal knowledge management group, under its Education & Research Department. This group was charged with creating various assets and processes with the following objectives: 1) increasing the re-use of knowledge, 2) facilitating higher functional effectiveness to enable competitive advantage, 3) using knowledge to improve quality continuously, 4) leveraging knowledge assets to capture high-end business consulting engagements, and 5) enhancing the brand similar to how universities leverage knowledge-intensive research activities to do the same (Latha, Suresh, & Mahesh, 2010).

The Infosys Knowledge Portal

Access to the Infosys KM system was normally made through Sparsh, the company's internal intranet. The KM landing page, which connected to the various elements of the KM system, is shown as Exhibit 8.

KShop

KShop, which is an abbreviated representation of Knowledge-Shop, was the principal knowledge management portal used to connect to the company's computer-based knowledge repository. Knowledge was organized based on a 4-level taxonomy that was developed in-house at Infosys. The top level taxonomy included the following categories:

- Technology
- Methodology
- Application Domain
- Project Management
- Culture
- Others
- Soft Skills

In addition to using the taxonomy, K-Shop supported search using keywords. Sample screen shots are presented in Exhibit 9 (A-E).

A standard template was used for submitting units of content, referred to as *Body of Knowledge* (BOK), which included meta tags in addition to the contribution itself. BOK was only added after it had been reviewed and vetted for accuracy, IP ownership, contributions, and compliance with Infosys standards. To encourage BOK contributions, individuals contributing were awarded Knowledge Currency Units (KCUs) that were based on some function of BOK ratings by users, time in repository, and access count. The KCUs could be cashed for rewards at Infosys gift shops.

Other Tools

The complete KM system offered a variety of other tools. These included the following:

- **Konnect:** A professional networking platform to connect with people, discover expertise, and share knowledge. This is similar to LinkedIn (not quite, more similar to twitter and facebook with features such as microblogging, artifact and expert search, community and interest group pages, discussion forums, question answering systems and the like), but internal to Infosys.

- **Infyblogs:** This is a blogging tool for Infosys employees, which allowed them to share their thoughts and experiences with others.
- **Team Wiki:** Project team members could use this tool to collaborate, share, and edit project knowledge with team members (see Exhibit 9E).
- **KMail:** Email system that allowed Infosys employees to post queries and get answers from experts as zip file attachments (see Exhibit 10).
- **Discussion Forum:** This is a collaborative tool that allows Infosys employees to discuss various topics of interest.
- **Search+:** A search solution for customized searches using keywords. Matching documents from a variety of sources such as K-Shop, Konnect, Kmail, and Discussion Forum, and, equally importantly, from the vast arrays of enterprise systems (HR data bases, project data bases, quality data bases), file systems in intranet sites, the home page of SPARSH, the Infosys intranet and the like were retrieved by this tool.

Project-Level KM Practices at Infosys

To ensure widespread adoption of KM practices at Infosys, KM champions were identified at various levels. The most critical of these was the project level, where the majority of knowledge assets were acquired, cataloged and used.

At the project team level, a team member was designated as KM Prime. This person, in addition to conducting the normal team activities, was also responsible for implementing KM practices at the team level. The process began with the development of a KM Plan, which provided specific goals and metrics (such as increasing productivity, reducing defects injected, reducing ramp up time, and reducing the cost of quality). Once agreed upon, the KM Plan was uploaded to IPM+, the project repository system at Infosys. The KM Prime then became responsible for educating the team about the KM Plan, tracking and reporting milestones, and finally for creating a BOK at the conclusion of the project for submission to K-Shop. In addition, KM Prime could coordinate the development of a Team Wiki and other knowledge assets such as the Induction Kit for the team. KM Prime also assisted new team members to come up to speed.

A KM Audit was conducted to measure K-Index, an aggregate measure to quantify the state of KM practice in a project. The K-Index incorporated various dimensions of KM practice in a project such as KM enabling and planning, KM infrastructure, KM culture, and knowledge sharing activities at the project level (Latha et al.). K-Index ranged from 0-100, and a score of 70 or higher was considered good.

Infosys organized Knowledge Cafes, a periodic event, where various project teams shared their KM practices with other Infosys employees.

KM Practices in Offshore Development Centers of Clients

Infosys campuses and other locations hosted Offshore Development Center (ODC) for Infosys clients. These were dedicated facilities of Infosys clients that were fenced by client firewalls and security measures, and therefore required somewhat modified KM procedures. While Infosys employees worked at client ODC facilities, they were subject to security measures intended to protect a client's confidential or proprietary information. As a result, Infosys employees often had very limited access to knowledge resources available at Infosys.

In many situations, an Infosys employee's desktop was connected only to a client's network and not to the Infosys network. In these situations, a separate dedicated terminal could be the only link for Infosys employees to the Infosys network. Further, the terminal itself might have restricted access to Infosys resources. Other clients might permit Infosys employees in an ODC to access Infosys knowledge resources through a terminal server from their desktop, a much less restrictive arrangement.

In restrictive situations where Infosys employees required access to knowledge resources situated in Infosys network, they needed to seek special permission from the client, to do so. Typically, the team request was received by KM Prime, who then sent it to Project Manager /Account Manager / Account Security Anchor. After vetting the request, the Project Anchor would then seek the client's permission. Depending on the client, access to KM solutions from ODC could be specified at various levels: no access, read-only summary access, read-only access, or read/write access. The process of getting access to Infosys knowledge resources could be direct access (no approval from client required), with the permission of Project Anchor (client approval not needed), with the concurrence of KM Anchor, and followed by the permission of the client, and no access at all in some cases.

Adding to the complexity related to knowledge sharing, project team members could be located at multiple ODCs of the client, which could be situated at geographically distributed locations.

KM Challenge of PP&S at Infosys

Infosys was striving to grow its PP&S business, with the long term goal of realizing over 30% of its total revenues from these product sales-oriented activities, a significant increase from the current single digit percentage. Starting with a successful banking solution called Finacle, Infosys has added more products to its portfolio including Flypp, iTransform, mConnect, Infosys Health Benefit Exchange, and SpeedSolve. Since existing KM practices and assets at Infosys had been focused on supporting the services and consulting businesses of Infosys, the growth of the PP&S business at Infosys created a potential need to restructure existing KM practices and assets in order to support a product design and development environment.

One of the most important ways in which product development differed from providing contracted IT services was the degree to which it was highly unstructured and dynamic. To support existing products, historical information on product development as well as versions needed to be maintained. Queries might that arrive years later that required answers with respect to why certain design choices were made, and how these decisions impacted future enhancements to a product. Quite often, such choices were dictated by the client. Understanding the forces that drove an application's evolution could prove central to managing the complexity of software as it grew in scope over time.

New product development was different in many ways. Proprietary frameworks and tools were often employed to minimize repetitive tasks, such as by using standard interfaces to reduce development costs. Subject matter experts (SMEs) on new products were few and had limited ability to predict how product features might impact demand for the product. Quite often, the individuals initially chosen for SME roles had to transition from these roles (within or outside Infosys), without leaving enough proprietary knowledge in the KM systems at Infosys. Due to the specialized nature of product knowledge, new recruits in the product team required a higher level of knowledge support, which the existing KM systems were unable to provide, thus mandating multiple queries to the SMEs. This situation was compounded by the fact that new product projects often consisted of many new recruits, particularly in their early stages. These many queries, in turn, overloaded the SMEs, who often found they were spending significant unproductive time answering the same question many times over, posed by different people.

In case of product development, market intelligence was also very critical. Knowledge of market trends including nuances in various markets, customer preferences, and competitions was needed to design a product that can be viable in the market place. This even proved to be true for a stable product such as Finacle that has a defined market. For new products, the situation was even more extreme, with product managers trying to figure out the exact problem or market need to address through their product offerings. With time to develop and market cycles needing to be as short as possible in order to take advantage of market opportunities, agility in design and development was critical.

The existing KM assets and processes at Infosys tended to be internally-focused (see Exhibit 1) and emphasized stored history. For example, K-Shop often failed to return relevant content when queries were made related to opportunities or emerging technologies. When it did, the content that was returned was often not sufficiently current or granular enough for use. Further searching K-Shop could be time consuming. The market intelligence information available in KM assets was very limited and, being accumulated from historical experience, was frequently dated.

The needs of product development would be far better served by an externally focused, forward looking KM approach. There was a need not only to refresh the market intelligence and product knowledge continuously in an agile manner, they also needed to retain specialized product historical knowledge that would become critical as the products later matured. Thus, the existing approach needed to be transformed, but not abandoned.

Possible Approaches

The options for KM design and use in the PP&S context were complex. In creating new products and applications, cookie-cutter approaches based upon past successes were unlikely to succeed—indeed they could stifle innovation. Instead the KM system would need to:

- inform its users about issues relating to design
- be more process focused, as opposed to helping users identify past solutions
- accommodate the large uncertainty associated with the market for any new product, a situation very different from working for a client under a specified contract

In the broadest sense, Suresh recognized that such a KM would need to focus on acquiring knowledge located *outside the company* as opposed to emphasizing the efficient management of internal technologies, practices, and experiences.

The KM issue, as it applied to PP&S, could not be separated from the related personnel issues. The traditional services offered by Infosys catered to engineers and often represented activities that could be highly specified—a prerequisite for cost effective outsourcing. Given an outsourcing perspective, it was natural that these employees would be motivated (and evaluated) on efficiency criteria. That gave them considerable incentive to employ KM when it seemed likely to yield efficient solutions.

The employees working in PP&S were engaged in the very type of activities that could not be outsourced. That required a different mindset—the kind of individual who might prefer to re-invent the wheel, particularly if he or she had a creative insight that it could be built better. Getting these individuals to use a KM as a first stop would not only be difficult, it might even prove to be counter-productive if highly innovative products were to be conceived.

It might also be possible to train existing high potential employees to transition from services to PP&S. The KM could either play a positive or negative role in this context. On the positive side, the right set of features—providing targeted access to the types of external knowledge that helped to identify product

niches and features that would be valued—could help these individuals change their perspective. On the other side, a KM system that behaved like the system that they had previously used might convey the message that only minor incremental changes in behavior and thinking were necessary to be effective in PP&S. That was definitely not a message that Suresh wanted to convey.

All of these concerns hinged upon being able to identify the types of knowledge that needed to be captured and organized for PP&S purposes. Infosys had been very effective in leveraging past knowledge to become one of the world's leaders in IT service delivery. What new knowledge would need to be captured in order to move up the value chain?

References

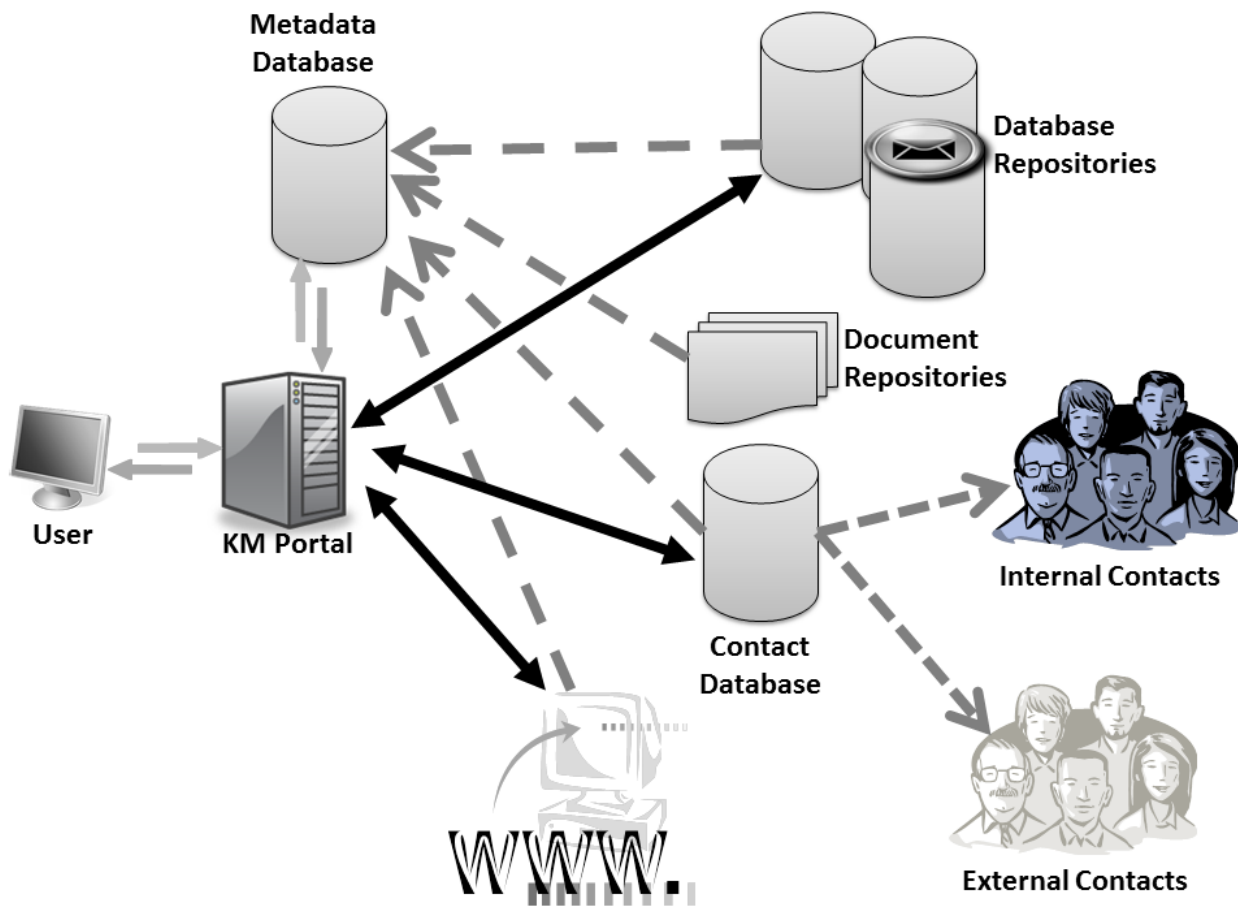
- India's outsourcing business: On the Turn. (2013. 19 January). *The Economist*, p. 14.
- Latha, A., Suresh, J.K., & Mahesh, K. (2010). KM in Projects: Methodology and Experience. In T. K. Srikantaiah, M. E. Koenig, & S. Al-Hawamdeh, (Eds.), *Convergence of project management and knowledge management* (pp. 145-173). Scarecrow Press. ISBN: 9780810876972

Exhibit 1: Sources of Knowledge³

Internal	e.g., Databases Documents Files Recordings Archives Intranet	e.g., Employees Contractors
	e.g., Web Libraries Journals Books Government	e.g., Consultants Researchers Professionals Personal Contacts
External	Stored	People


³Source: Prepared by case writer.

Exhibit 2: Typical Knowledge Management Architecture⁴




⁴ Source: Prepared by case writers

Exhibit 3: DCMI Specifications


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As part of its mission, the Dublin Core Metadata Initiative develops and maintains specifications in support of resource description. Specifications developed and reviewed in the context of DCMI's [formal approval process](#) are assigned a status (in ascending order of maturity and stability) of "DCMI Working Draft", "DCMI Proposed Recommendation", or "DCMI Recommendation". DCMI also provides pointers to guidelines and services developed outside of this formal review context ("Recommended Resources").

This selection highlights the specifications that currently attract the most attention in the Dublin Core community. Links to additional specifications (including superseded specifications) may be found at <http://dublincore.org/documents/>. Some of the specifications have been [translated](#) into one of twenty-five languages.

You can learn more about metadata and DCMI by exploring the pages listed in the menu bar above: [the Home page](#), [Metadata Basics](#), [Specifications](#) (this page), [Community and Events](#), and [About Us](#).

Semantic Recommendations

DCMI Metadata Terms [DCMI Recommendation]. This periodically updated document provides a one-stop source of up-to-date information on DCMI metadata terms, including the classic Dublin Core Metadata Element Set, the DCMI Type Vocabulary, and resource classes used as formal domains and ranges. Supporting documents includes

- **DCMI Namespace Policy** [DCMI Recommendation]. This document describes how metadata terms are assigned URIs by DCMI and the policies governing changes to the documented meanings associated with those URIs.
- **DCMI term declarations represented in RDF schema language**. Since 2001, DCMI term declarations have been published as Web documents (with the status DCMI Recommendation) and, in parallel, as machine-processable RDF/XML documents.
- **The Dublin Core Metadata Registry** [DCMI Recommended Resource]. This application, hosted at the University of Tsukuba as a service for the DCMI community, provides a [navigational interface](#) to DCMI's machine-processable RDF term declarations. The registry is under development as an open-source software project.
- **Dublin Core Metadata Element Set** [DCMI Recommendation]. This document excerpts from DCMI Metadata Terms the fifteen elements of the classic "Dublin Core", which has been standardized as:
 - [ISO Standard 15836:2009](#)
 - [ANSI/NISO Standard Z39.85-2012](#)

User guidelines

Interoperability Levels for Dublin Core Metadata [DCMI Recommended Resource]. This document articulates current thinking in the Dublin Core community about the nature of metadata interoperability. [Read more...](#)

Guidelines for Dublin Core Application Profiles [DCMI Recommended Resource]. This document provides guidelines for the creation of Dublin Core Application Profiles. The document explains the key components of a Dublin Core Application Profile and walks through the process of developing a profile. The document is aimed at designers of application profiles -- people who will bring together metadata terms for use in a specific context.

Singapore Framework for Dublin Core Application Profiles [DCMI Recommended Resource]. The Singapore Framework for Dublin Core Application Profiles is a framework for designing metadata applications for maximum interoperability and for documenting such applications for maximum reusability. The framework defines a set of descriptive components that are necessary or useful for documenting an Application Profile and describes how these documentary standards relate to standard domain models and Semantic Web foundation standards. The framework forms a basis for reviewing Application Profiles for documentary completeness and for conformance with Web-architectural principles.

Using Dublin Core [DCMI Recommended Resource]. From January 1998 through the latest version in November 2005, this document was maintained as the main entry point for new users of Dublin Core metadata. While this document is accessibly written, with useful concrete examples, readers should be aware that the document is by now somewhat out of date and is best used in conjunction with [Guidelines for Dublin Core Application Profiles](#).

🌟 Model-related specifications

DCMI Abstract Model [DCMI Recommendation]. This document specifies an abstract syntax for "description sets" (metadata records). Finalized as a DCMI Recommendation in March 2005, the DCMI Abstract Model (DC-AM) expressed the style of metadata that had emerged in the Dublin Core community over the previous decade as formal constructs based on the W3C Resource Description Framework (for example, by giving a formal definition to the DC-specific notion of a "vocabulary encoding scheme" and providing for the use of parallel labels in multiple languages). The Abstract Model was designed to bridge the modern paradigm of the unbounded, linked data graph and the more familiar paradigm of the validatable metadata record, providing a foundation for the development of application-independent syntax specifications and constraint languages.

Description Set Profiles: A constraint language for Dublin Core Application Profiles [DCMI Working Draft]. This document specifies an application-independent language for the constraints used in defining "templates" for metadata records -- for example, to specify a template for records which describe exactly "one book", with "up to ten authors", using "subject headings from the Library of Congress". This specification represents work in progress and is likely to evolve in response to implementation experience.

Criteria for the Review of Application Profiles [DCMI Recommended Resource]. This document was developed by the DCMI Usage Board to evaluate Application Profiles for documentary completeness and for conformance with linked-data principles. The criteria are based on the DCMI Abstract Model, Description Set Profile (DSP) language, and Singapore Framework. Even when conformance with these specifications is not a requirement, implementers may find these review criteria useful for uncovering flaws or weaknesses in the logic of an application profile.

A MoinMoin Wiki Syntax for Description Set Profiles [DCMI Working Draft]. Using this draft syntax, editors can embed formal constraint information about application profiles into normal Wiki documents and extract this information using an [Open Source MoinMoin Wiki tool](#) into an XML representation. This functionality is illustrated by the [MoinMoin Wiki document for the Scholarly Works Application Profile](#).

Syntax guidelines

DC-TEXT [DCMI Recommended Resource]. "Expressing Dublin Core metadata using the DC-Text format" is a syntax for representing a DC-AM Description Set in plain text. Its primary use is in presenting metadata constructs for human consumption.

DC-HTML [DCMI Recommendation]. "Expressing Dublin Core metadata using HTML/XHTML meta and link elements" describes how a Dublin Core metadata description set can be encoded using the HTML/XHTML <meta> and <link> elements. This specification is also an HTML "meta data profile" as defined by the HTML specification. See also:

- [RDFa](#), another syntax for embedding Dublin Core descriptions in Web pages, which became a [W3C Recommendation](#) in October 2008 and has strong tool support in platforms such as [Drupal](#) and Yahoo's [Search Monkey](#).
- The predecessor specification for DC-HTML, [DCQ-HTML](#) (last updated in 2003), consistently remains one of the most-accessed documents on the DCMI Web site despite its clearly marked status as a "Superseded Recommendation". Early versions of this specifications used the so-called "dotty" syntax for appending an additional "qualifier" to an element name, as with "DC.Coverage.temporal" -- an encoding style that is now discouraged. This and other related issues are discussed in "[Notes on DCMI specifications for Dublin Core metadata in HTML/XHTML meta and link elements](#)".

DC-DS-XML [Proposed Recommendation]. "Expressing Dublin Core Description Sets using XML (DC-DS-XML)" specifies an XML format for representing a Dublin Core metadata description set. The specification supports all of the features of a Description Set as described by the DCMI Abstract Model. Related resources include:

- [Notes on DC-DS-XML XML Format](#), which describes the development of the format and its relationship to the 2003 specification, DC-XML-GUIDELINES.
- [DC-XML-GUIDELINES](#) [DCMI Recommendation]. The specification "Guidelines for implementing Dublin Core in XML" of April 2003 has been used in numerous implementations and remains popular despite its well-described limitations (see above). [XMLS schemas](#) implementing the 2003 encoding conventions are available in several variants.

DC-RDF [DCMI Recommendation]. "Expressing Dublin Core metadata using the Resource Description Framework (RDF)" describes how constructs of the DCMI Abstract Model may be expressed in RDF graphs. How this document relates to earlier styles for expressing Dublin Core metadata in RDF is discussed in "[Notes on DCMI specifications for Dublin Core metadata in RDF](#)".

Source: <http://dublincore.org/specifications/>

Exhibit 4: Infosys Overview⁵

What We Do

Infosys Limited (NYSE: INFY) was started in 1981 by [seven people with US\\$ 250](#). Today, we are a global leader in consulting, technology and outsourcing with revenues of US\$ 7.231 billion (LTM Q3 FY13). Many of the world's most successful organizations rely on Infosys to deliver measurable business value. Infosys provides business consulting, technology, engineering and outsourcing services to help clients in over 30 countries build tomorrow's enterprise.

Our award-winning Infosys Labs and its breakthrough intellectual property can be leveraged as a co-creation engine to accelerate innovation across the enterprise.

Infosys pioneered the [Global Delivery Model](#) (GDM), based on the principle of taking work to the location where the best talent is available, where it makes the best economic sense, with the least amount of acceptable risk. Continued leadership around GDM enables Infosys to drive extraordinary efficiencies and free up clients' resources for strategic transformation or innovation initiatives.

Infosys has a [global footprint](#) with 67 offices and 69 development centers in US, India, China, Australia, Japan, Middle East, UK, Germany, France, Switzerland, Netherlands, Poland, Canada and many other countries. Infosys and its subsidiaries have 155,629 employees as on Dec 31, 2012.

Infosys takes pride in building strategic long-term client relationships. 97.5% of our revenues come from existing customers (Q3 FY 13).

Infosys gives back to the community through the Infosys Foundation that funds learning and education.

How we do it

Infosys helps companies derive the measurable business value that they have always been looking for from business and IT investments.

We deliver measurable business value in 3 ways:

Transform

We can transform the fundamental shape of your business P&L. Regardless of which team you engage with, we have a best-practice process for delivering value. We call it IMPACT – to ensure a clear line of sight from process change to bottom-line impact, ensuring that you receive the business value you were promised.

Optimize

Beyond transformation and innovation, it boils down to execution - delivering on time, on budget and "on value". We can optimize your core operations to drive best-in-class efficiency and help fund the transformation and innovation.

Innovate

We can inject a level of product and service innovation into your business to create new revenue opportunities through collaboration and co-creation. We keep abreast of the latest technology and how it applies to your business issues. What you get from us is best-of-breed solutions. The foundation of our

⁵ Source: Infosys website

innovation capability is our core lab network – Infosys Labs – and the new thinking that our team of over 600 researchers brings to the table.

Who we are

Our Vision, Mission and Values –

Vision

"We will be a globally respected corporation."

Mission

"Strategic Partnerships for Building Tomorrow's Enterprise."

Values

We believe that the softest pillow is a clear conscience. The values that drive us underscore our commitment to:

CLIFE

Client Value: To surpass client expectations consistently

Leadership by Example: To set standards in our business and transactions and be an exemplar for the industry and ourselves

Integrity and Transparency: To be ethical, sincere and open in all our transactions

Fairness: To be objective and transaction-oriented, and thereby earn trust and respect

Excellence: To strive relentlessly, constantly improve ourselves, our teams, our services and products to become the best

Exhibit 5: Infosys Timeline⁶

Milestones

2012

- Listed on the NYSE market
- Infosys acquires Lodestone Holding AG, a leading management consultancy based in Switzerland
- Forbes ranks Infosys among the world's most innovative companies
- Infosys among top 25 performers in Caring for Climate Initiative
- Infosys crosses the US\$ 7 billion revenue mark

2011

- N. R. Narayana Murthy hands over chairmanship to K V Kamath
- Infosys crosses US\$ 6 billion revenue mark, employee strength grows to over 130,000

2010

- Infosys crosses the US\$ 5 billion revenue mark

2009

- Infosys opens its first development center in Brazil and second Latin American development center in Monterrey, Mexico
- Infosys selected as a member of The Global Dow
- Employee strength grows to over 100,000

2008

- Infosys crosses revenues of US\$ \$ 4.18 billion
- Annual net profits cross US\$ 1 billion

2007

- Infosys crosses revenues of US\$ 3 billion. Employees grow to over 70,000+
- Kris Gopalakrishnan, COO, takes over as CEO. Nandan M. Nilekani is appointed Co-Chairman of the Board of Directors
- Opens new subsidiary in Latin America
- Reports Q2 revenue of over US\$ 1billion

⁶ Source: Infosys website

2006

- Infosys celebrates 25 years. Revenues cross US\$ 2 billion. Employees grow to 50,000+
- N. R. Narayana Murthy retires from the services of the company on turning 60. The Board of Directors appoints him as an Additional Director. He continues as Chairman and Chief Mentor of Infosys

2005

- Records the largest international equity offering of US\$ 1 billion from India
- Selected to the Global MAKE Hall of Fame

2004

- Revenues reach US\$ 1 billion
- Infosys Consulting Inc. is launched

2003

- Establishes subsidiaries in China and Australia
- Expands operations in Pune and China, and sets up a development center in Thiruvananthapuram

2002

- Touches revenues of US\$ 500 million
- Nandan M. Nilekani takes over as CEO from N.R. Narayana Murthy, who is appointed Chairman and Chief Mentor
- Opens offices in the Netherlands, Singapore and Switzerland
- Sponsors secondary ADS offering
- Infosys and the Wharton School of the University of Pennsylvania set up The Wharton Infosys Business Transformation Awards (WIBTA)
- Launches Progeon, offering business process outsourcing services

2001

- Touches revenues of US\$ 400 million. Opens offices in UAE and Argentina, and a development center in Japan
- N. R. Narayana Murthy is rated among Time Magazine/CNN's 25 most influential businessmen in the world
- Infosys is rated as the Best Employer by Business World/Hewitt

2000

- Touches revenues of US\$ 200 million
- Opens offices in France and Hong Kong, a global development center in Canada and UK, and three development centers in the US
- Re-launches Banks 2000, the universal banking solution from Infosys, as Finacle™

1999

- Touches revenues of US\$ 100 million. Listed on NASDAQ
- Infosys becomes the 21st company in the world to achieve a CMM Level 5 certification
- Opens offices in Germany, Sweden, Belgium, Australia, and two development centers in the US
- Infosys Business Consulting Services is launched

1998

- Starts Enterprise Solutions ([packaged applications](#)) practice

1997

- Opens an office in Toronto, Canada
- Infosys is assessed at CMM Level 4

1996

- The Infosys Foundation is established

1995

- Opens first European office in the UK and global development centers at Toronto and Mangalore. Sets up e-Business practice

1994

- Moves corporate headquarters to Electronic City, Bangalore. Opens a development center at Fremont

1993

- Introduces Employee Stock Options (ESOP) program
- Acquires ISO 9001/TickIT certification
- Goes public

1987

- Opens first international office in Boston, US

1983

- Relocates corporate headquarters to Bangalore

1981

- Infosys is established by N. R. Narayana Murthy and six engineers in Pune, India, with an initial capital of US\$ 250
- Signs up its first client, Data Basics Corporation, in New York

Exhibit 6: Infosys Products⁷

Finacle - Universal Banking Solution

Finacle from Infosys partners with banks to transform process, product and customer experience, arming them with 'accelerated innovation' that is key to building tomorrow's bank. Finacle solutions address the core banking, wealth management, CRM, Islamic banking, treasury, e-banking and mobile banking requirements of retail, corporate and universal banks worldwide.

Flypp - Application Marketplace

White-labeled app marketplace that helps partners to actively engage their consumers across digital channels

Infosys Account Origination System

Enables enterprise-class onboarding with data capture and due diligence capabilities to automate decisioning and fulfillment

Infosys Alert and Case Management System

Supports end-to-end management of cases, alerts, and exceptions across departments

Infosys Customer Self-Service Energy Manager

Helps utilities ensure customer delight through sustainable energy management and revitalized customer service

Infosys Forward Compliance System

A non-intrusive system that easily adapts and integrates with the client enterprise setup and can support a centralized, decentralized or hybrid style of FATCA implementation approach.

Infosys Health Benefit Exchange

Novel, transparent, and competitive insurance hub, for individuals and small businesses to buy qualified plans

Infosys iTransform - ICD-10 Migration Suite

Automates all stages of migration to ICD-10 and helps organizations turn compliance into a competitive advantage

Infosys mConnect - Multi-Channel Mobile Middleware

Optimizes user experience through its context aware mobile multimode middleware across channels and platforms

Infosys Meter Data Management Appliance

Infosys Meter Data Management Appliance is a complete Oracle hardware and software solution, which can be easily tailored to your utility business and IT landscape.

Infosys Omni-Channel Personalization Engine

Helps retailers foster consumer relationship by presenting personalized content across channels

⁷ Source: Infosys website

Infosys Real-Time Expertise Manager

Delivers customer delight by making every interaction effective and by providing instant access to expertise

Infosys Trade Origination System

Strategically differentiates your brokerage services and provides superior trading experience to customers

Infosys Transaction Reconciliation System

Comprehensive operations platform that addresses end-to-end reconciliation needs of an enterprise

SpeedSolve

Collaborative, chat-based customer support product from Infosys and AT&T to reduce your call transfer rates, call handle time, and call volumes.

Exhibit 7: Infosys Platforms⁸

Our [Infosys Edge](#) suite of business platforms is built around specific themes that provide significant opportunities to enterprises. We focus on delivering guaranteed business outcomes that impact either our client's top line or bottom line. We host, operate and manage these business platforms on a subscription-based pricing model, providing our clients with rapid time-to-value

Infosys AssistEdge

The first integrated cross channel product for contacts centers to transform customer service experience.

Infosys BigDataEdge

Infosys BigDataEdge is the best data platform that helps empower technology and business teams to develop industry-specific insights and act on them very quickly.

Infosys BrandEdge

Simplifies digital marketing across the organization through the first comprehensive Cloud-based Platform

Infosys CommerceEdge

Drives multi-channel commerce by enhancing consumer experience, driving traffic and increasing order value

Infosys Credit Servicing Platform

Integrated credit servicing & asset management platform for managing multiple loans & asset classes across the globe

Infosys IT Asset Performance Management Platform

Maximizes return on IT asset investments by enhancing performance, mitigating risks while optimizing costs

Infosys SocialEdge

Monetizes digital demand by harnessing the power of social media to deepen consumer & employee engagement

Infosys ProcureEdge

Helps enterprises realize rapid and sustainable savings across their source-to-pay lifecycle

Infosys TalentEdge

Enables enterprises to deepen employee engagement and simplify the entire Hire-to-Retire lifecycle of HR function

Infosys TradeEdge

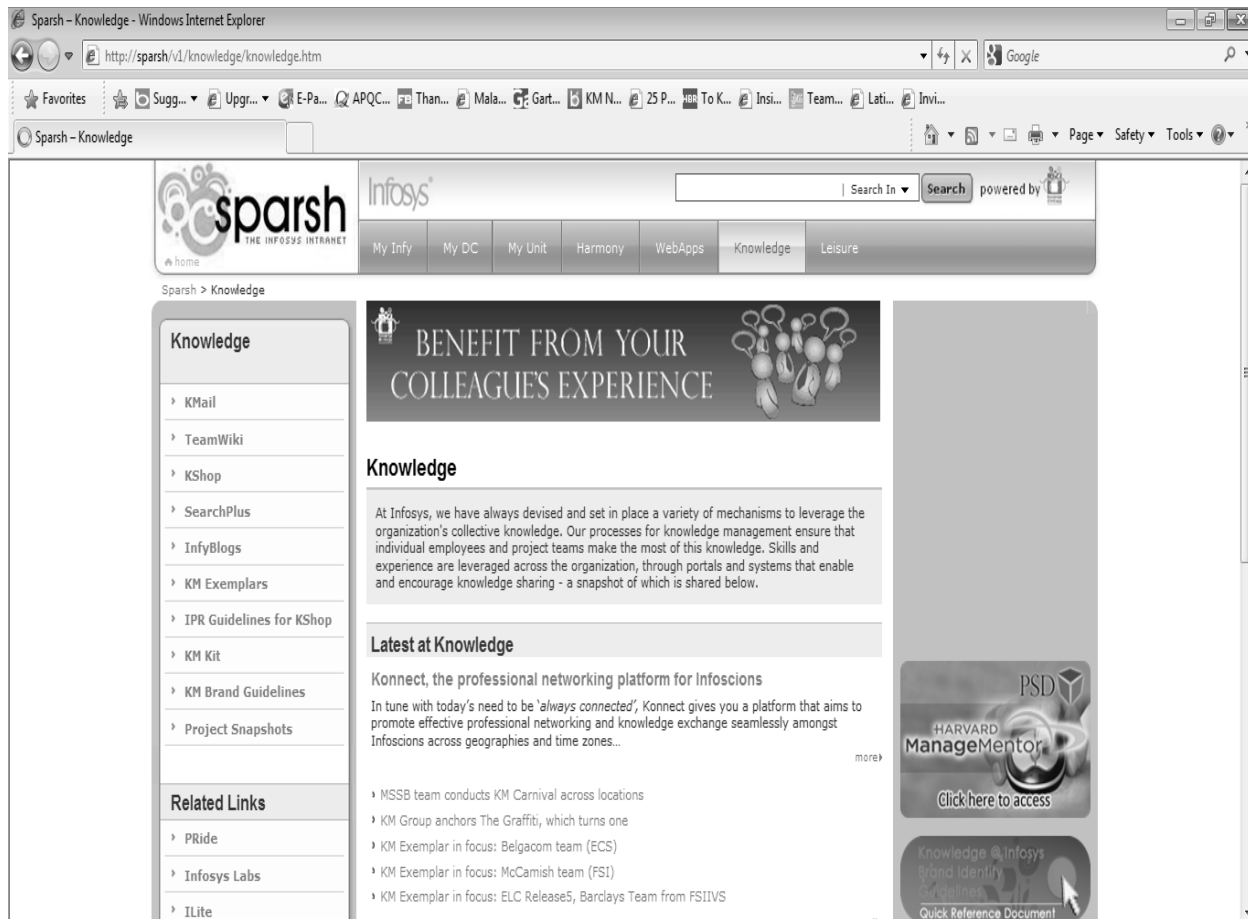
Enables global companies to accelerate long-term growth and profitability in emerging markets

Infosys WalletEdge

Enables a financial ecosystem of consumers, merchants, telecoms, banks, government, and enterprises, to process payments

⁸ Source: Infosys website

Exhibit 8: KM Landing Page on Sparsh⁹

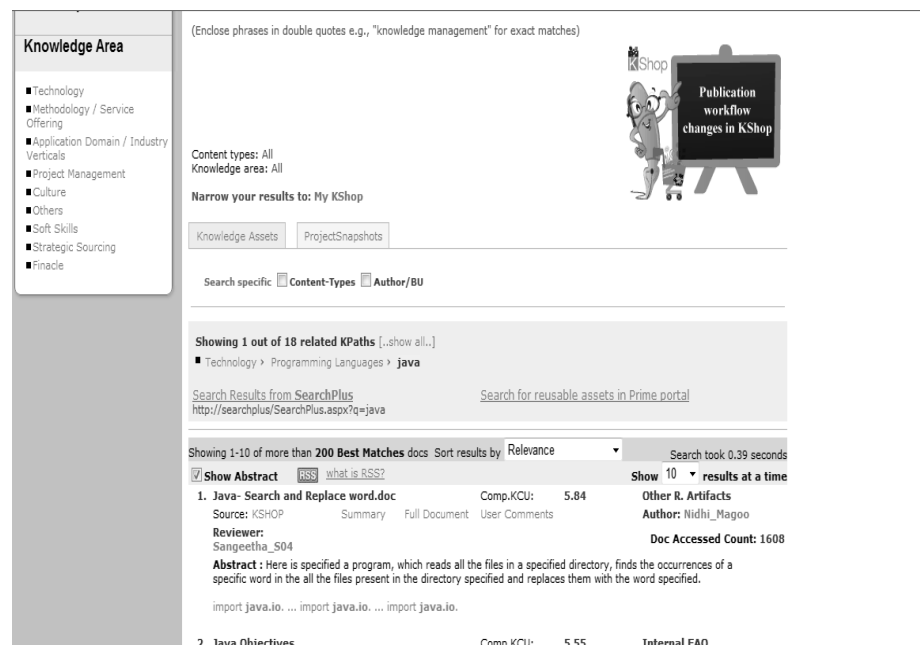


⁹ Source: Screenshot provided to case writers by Infosys

Exhibit 9: Selected Screenshots from Infosys KM System¹⁰

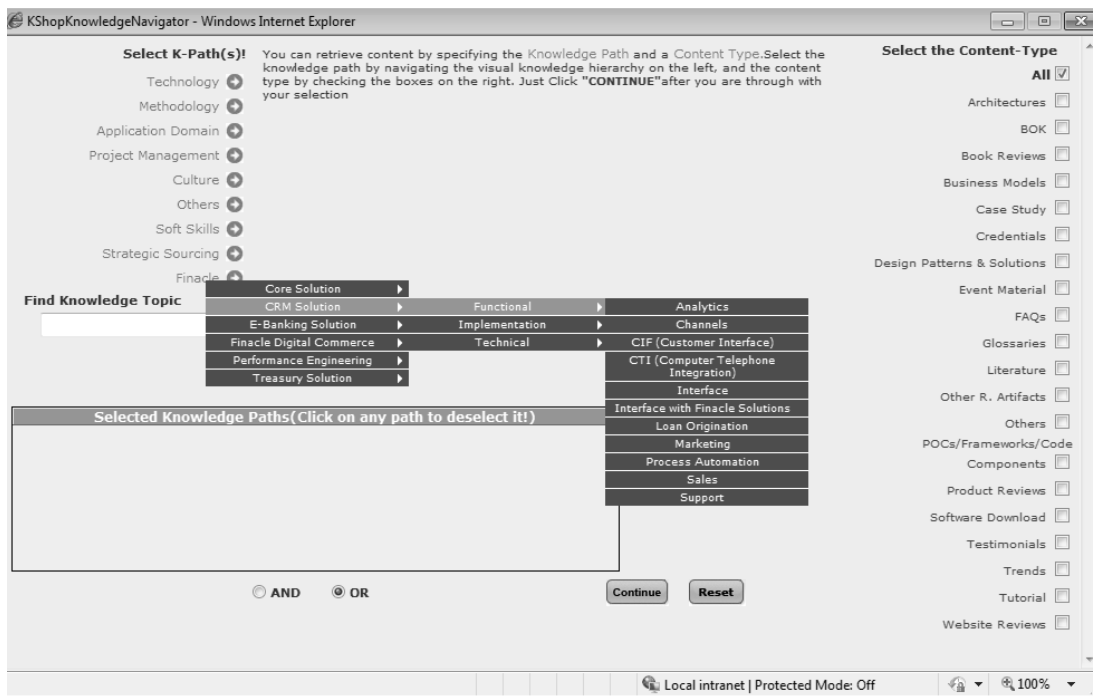


A. Search screen for K-shop

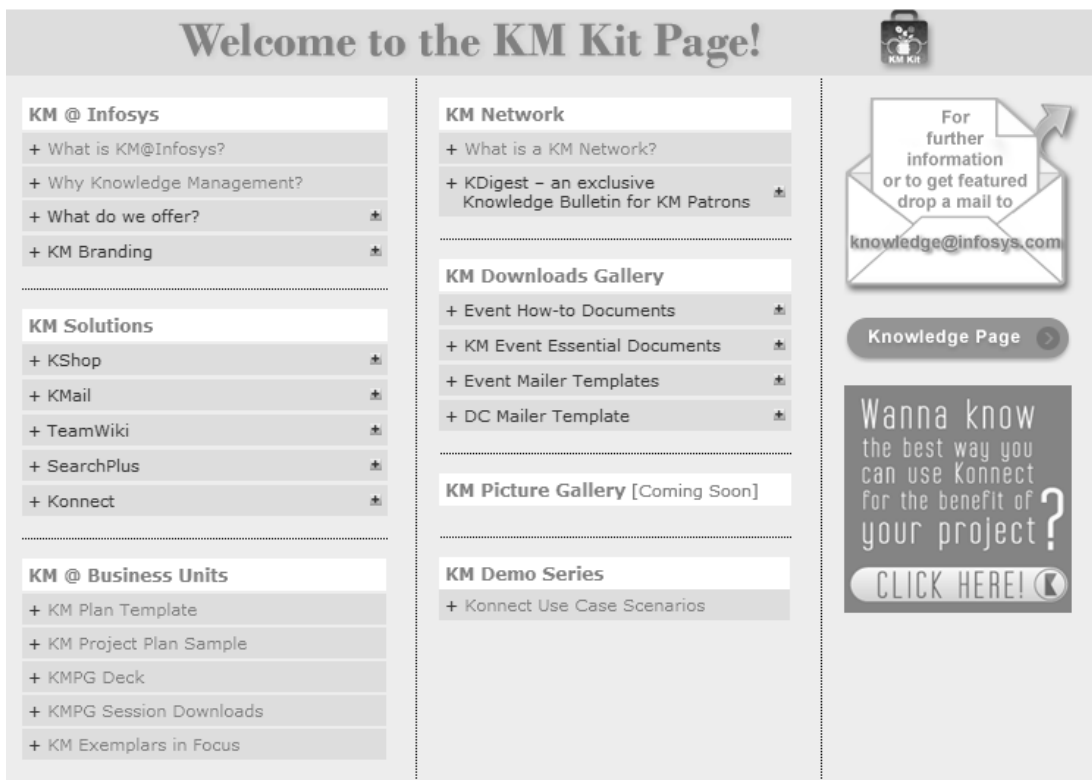


B. Search results from K-shop

¹⁰ Source: Screenshots provided to case writers by Infosys



C. Knowledge Navigator interface



D. KM Kit page


You are here: [TeamWiki Home](#)>[TechFreak](#)>[WebHome](#) (01 Jun 2012, anisha_cascar)

Technology	Fun	About Us	People
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Welcome to TechFreak?

We here at [TechFreak?](#) started the teamwiki to share knowledge based on mobility, wireless and embedded systems. Geeks are welcome to share on there views about technology.

We are building the entire portal to have a great ambience over here.



Edit | Attach | | Print version | History: r10 < r9 < r8 < r7 | Backlinks | View wiki text | Edit wiki text | More topic actions

E. TechFreak wiki-based sharing page, built within the TeamWiki system

Exhibit 10: Selected Screenshots from Infosys K-Mail System¹¹

My Open Queries | My Answered Queries | My Replies | Preferences

KMail

PMs | KM Group | Business In.. | CAD-CAM-CAE.. | More...

Forums

PMs

Search In KMail

Q

Query

Latest Conversations | Popular Conversations

• Making website available only over domain name (Tomcat on Linux)

Latest Reply : Hi Senthil, Can you please guide? We can put a CNAME to point to amazon cloud but not sure what ec2 link refers to. Regards -Prakash

Posted By: Shankar_K Last Modified On : 6/12/2012 7:18:22 PM Replies : 1

View All ▶

Popular Search Keywords

Accounts
Browser Compatibility
Character in Unix Dm
Egl
Forecast for Partner
Ibm
Inward Clearing
Upload
Latest bo Generation
Middleware Migration
Pass Percentage
Post Query Practices
Process Project
Revenue Sharing
RFP for Iterative
SRV SetErrorTag

A. K-mail search

Reply Navigator

Raghunatha M S

Narahari G S

Reverted Rubber Aquaplaning/Hydroplaning

Tags: CAD-CAM-CAE

Reverted Rubber Aquaplaning/Hydroplaning

Posted By: Raghunatha M S On:5/11/2012 3:08:49 PM

Hi all, I have certain doubts about the subject of yesterday's SkyQuest mailer: Reverted Rubber type of Aquaplaning.

Q Is it called "Aquaplaning"/"Hydroplaning" only when there is loss of traction?

Q Whether there is water film or not, when the wheel is locked, rubber is going to melt/burn. So what are we saying? Is there is going to be enough traction to control the vehicle when there is no moisture? (It might be better, but I doubt if it is going to be enough.)

Q Why is it a concern only for Aero folks. I never heard any Auto folks talk about it! I mean 20knots is just 37kph. And we all drive our cars brake on wet roads all the time at higher speeds.. And we burn our tires. (Is it because in a smaller vehicle driver can immediately figure the wheels are skidding and take corrective measures in split second, and in larger vehicle (airplane) it is difficult for the driver (Pilot) to fix unless he can feel the side-wind pushing the vehicle sideways?!)

Yes, I went through the Wikipedia page & the NASA's paper about it. Not entirely convinced.

Regards,

B. K-Mail sample response

¹¹ Source: Screenshots provided to case writers by Infosys

28

Infosys

replies
(1)

Reverted Rubber Aquaplaning/Hydroplaning

Posted By: Narahari G S On:5/11/2012 5:03:56 PM

Hi Raghunatha,

➤ What are you trying to ask? Aquaplaning implies a layer of water between the tire and tarmac. Loss of traction is bound to be one of the consequences. You either have aquaplaning or not, no?

➤ In the absence of a water film and when the wheels are locked, the nature of motion between the tire and tarmac changes from rotary to sliding. The friction still exists, therefore, it would seem like a better situation than when multiple wheels experience aquaplaning (complete loss of friction/uncontrolled skid).

➤ It is equally important for both auto and aero folks. In case of automotive, it would appear that ABS is fairly standard across medium end vehicles onwards.

In case of lower end vehicles, most cannot achieve the velocities required to cause severe aquaplaning / reverted aquaplaning.

On the other hand, any civilian aircraft will touch down at higher velocities (relative to cars). Additionally, they are heavier (upto 560 tons) and have larger wheels, larger contact areas, and therefore more pressure generated along the leading edge of the contact patch of rubber. This pressure is an important parameter as

it controls the force with which water is ingested into the space between the tire and tarmac.

In case of a smaller vehicle, if the driver detects aquaplaning, there is nothing he can do to control the vehicle because the vehicle simply won't respond to his inputs. The only thing he can do is pray that the stretch of road ahead of him/her remains empty long enough for the vehicle to slow down and for the layers of water to dissipate from under the tires.