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KNOWLEDGE MANAGEMENT IN BUSINESS- A REVIEW OF TECHNIQUES AND TOOLS

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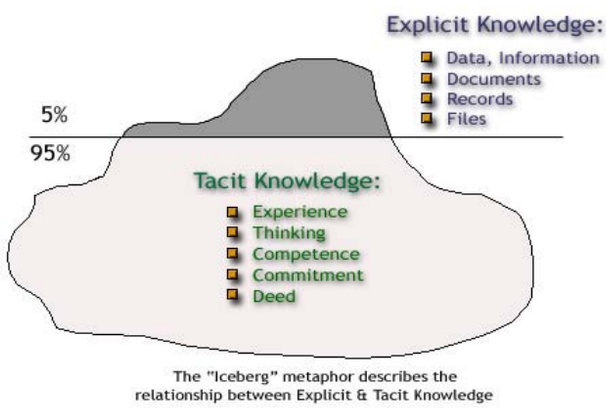
Abstract *Knowledge Management Systems (KMS) are gaining strategic importance in business these days. They are acting as key enablers of business performance monitoring and catalyst for the business processes. The acceptance of this new strategy and final implementation still remain full of apprehensions and it demands a lot of future research on a global scale. Through Knowledge Management Systems, organisations seek to acquire and create potentially useful knowledge. This should give way to making it available to those who use it at appropriate time and place and achieve maximum effective usage which positively influences organisational performance. In this paper an effort is made by the authors to review some of the techniques and tools which have enabled organisations worldwide to implement knowledge management activities with a well-informed approach successfully.*

Keywords: *Knowledge, Knowledge Management (KM), Knowledge Management System (KMS), Knowledge Management Software, Knowledge Workers.*

1. KNOWLEDGE

Knowledge is a broad and abstract belief that has been of growing interest in the corporate and academic sectors. It is acquiring position as a significant organisational resource. Influenced by the quantum rise in quality and quantity of organisational knowledge and knowledge management (KM) issues and concerns, a new class of information systems have been promoted and created, referred to as Knowledge Management Systems (KMS). The objective of a KMS is to support creation, transfer, and application of knowledge in organisations. Nonaka (1994) has stated two dimensions of knowledge in organisations: tacit and explicit. Rooted in action, experience, and involvement in a specific context, the tacit dimension of knowledge (or tacit knowledge) is comprised of both cognitive and technical elements. The explicit dimension of knowledge (or explicit knowledge) is articulated, codified, and communicated in symbolic form and/or natural language. Whether tacit or explicit knowledge is the more valuable is debatable. The two are not classifications of knowledge, but mutually dependent and reinforcing qualities of knowledge: tacit knowledge forms the background necessary for assigning the structure to develop and interpret explicit knowledge (Polanyi, 1975), refer Figure 1.

Figure 1: The Two dimensions of Knowledge (http://www.cognitivedesignsolutions.com/KM/ExplicitTacit.htm)

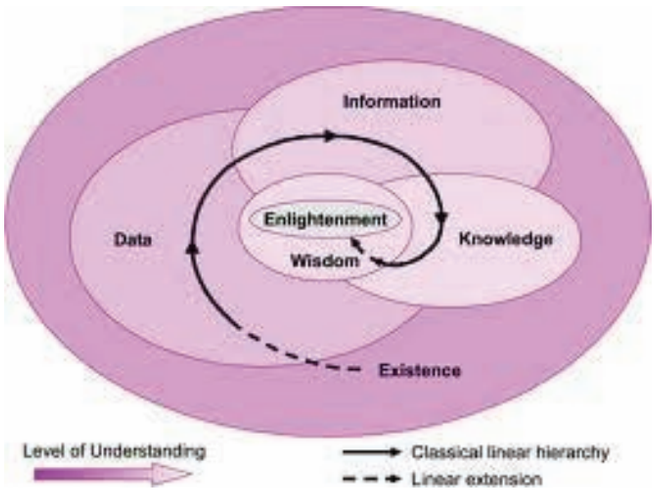


The interwoven linkage of tacit and explicit knowledge suggests that only individuals with a requisite level of shared knowledge can truly exchange knowledge, thus for effective knowledge sharing, there must be some overlap in the underlying knowledge bases (a shared knowledge space) of the two individuals who interact (Ivari and Linger, 1999; Tuomi ,1999). By applying technology we can manage "weak ties" (i.e. informal and casual contacts among individuals)

in organisations (Pickering and King, 1995), and thereby increase the breadth of knowledge sharing.

Before studying the importance of KM in business, it is important to keep the following points in mind. Firstly, understanding the difference among data, information, and knowledge and drawing implications from the difference (Figure 2). Secondly as knowledge is personalized, in order for an individual/ group's knowledge to be useful for others; it must be expressed in a manner such that it is understood by the receiver. And thirdly, hoards of information are of little value; only the information which is actively processed in the mind of an individual through a process of reflection, enlightenment, or learning can be useful (Alavi and Leidner, 2001**).**

Figure 2: Data, Information and Knowledge: *The E2E model – A complexity-based view of the cognitive system of knowledge (from* **Jean-Baptiste** *et al***., 2008)**



2. Knowledge Management

To benefit from the potential opportunities of the Internet and for managing and retrieving online knowledge there is a need for development of an improved information search and retrieval system. There are efforts for a sophisticated intelligent information extraction tools that allow capabilities to present the user only with the information they need, rather than a large set of relevant documents to read. Individuals come across a huge quantity of data and information every day. Scientists have worked out upon the data that is sent to a typical person in the course of a year and found that it is the equivalent of every person in the world reading 174 newspapers every single day (Derbyshire, 2011). Internet search providers, web portals, and community websites could benefit users by adopting Knowledge Management Systems, particularly those with effective information extraction capabilities. Thus it can be concluded that overload of data is creating crisis and making knowledge management increasingly more important.

Communication and conversation are essential part of a knowledge management system. But there may be two challenges: 1) Huge amount of data and information are flowing. No method is reducing the information overload; rather they are merely changing the number of channels through which that overload of information comes. 2) Another issue is the way in which this information is presented. Some knowledge management systems employ methods such as setting up a shared folder, and notifying all the members of the community if there is any update to any file within that folder, which relates to effective communication. So if the communication is poor, it can lead to information overload. There is a need to organise the information, and send it out in a processed and compressed form, rather than sending it out in a raw form which is in a subjective and worthless state. Also information overload does not exist when information desired is obtained. What causes the overload is an overload of irrelevance. It is a matter of urgency, importance and relevance. It's a signal to noise ratio. Retrieving the gold from the mine!

3. The Technique for a Knowledge Management System

-Connecting right people with right information for competitive advantage

Knowledge management is important for organisations to sustain their competitive advantage for a long period of time. It is a key resource to face worldwide competition, motivate employees and encourage innovation. Drucker (1993) states that the means of production are no longer capital, natural resources or labour. It is and will be knowledge. New digital technology is improving business efficiency by radically increasing the quality and quantity of information available to knowledge workers. Knowledge management strategies help organisations decide which new knowledge-management technologies are relevant to a business and show how to use them to build an integrated knowledge-management solution. The KM implementations enable smarter business planning and analysis, faster product design and feedback, more effective project and people tracking, and better employee management and training.

Some features of a knowledge management system should be to: 1) implement an enterprise knowledge-management solution to enhance communication among stakeholders, 2) recognize an organisation's knowledge assets , 3) identify barriers to knowledge sharing, 4) separate myths from realities, 5) sustain implementation drawbacks and failures, 6) scrutinize successful knowledge-management solutions for product design, consumer management, employee

management, and business planning, 7) choose technology build-in modules and proven best practices that can help to implement a successful knowledge-management solution for an enterprise, 8) foster constant innovative learning about knowledge-management strategy, platforms, and technologies and inquire on ways they can help to connect people and processes with the knowledge they need, and finally 9) discover ways to build a knowledge-management solution that adapts and constantly evolves with time.

Literature review illustrates that many big companies loose a huge amount of money by failing to share knowledge. These threats coupled with the present dynamic global economic scenario need attention. Actively managing knowledge can help companies increase their chances of success by facilitating decision-making, building learning environments, and encouraging change and innovation. Processed flood of information can hamper high-quality decision making. Effective knowledge management system can facilitate separating knowledge from the noise, share information, and improve decision-making. This can be achieved through forums for sharing best practices, accelerating progress, and discussing successes, failures, and experiences (Sinha *et al.*, 2012). While information overload leads to huge efforts for knowledge retrieval, a knowledge management system can facilitate better and more informed decisions.

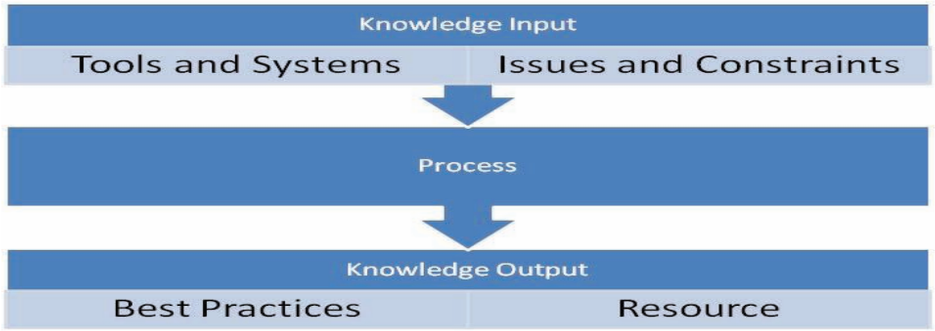
Knowledge management systems can assist building a learning organisation by enforcing the concept of learning as a ritual. This can create a sharing culture where continuous assessing and monitoring is practiced to look for ways to improve. After each activity or event, review and identification of successes and failures are done, and there are consistent efforts to perform better the next time. The free flow of ideas that occur, can be gathered through management development, leadership and entrepreneurship development programs, and focused workshops. The motive should be to become aware and also open up dialogue, instill corporate values, and stimulate cultural change (Garvin, 2000). This approach to capturing learning from experiences facilitates building knowledge base that can then be used to streamline operations and improve processes. Managing organisational knowledge can also inspire cultural change and innovation. In this complex, global business environment, such knowledge management programs can empower individuals to embrace change and encourage ideas and insight, which inculcate innovation.

4. Technique for Implementing a Knowledge Management Solution

Implementing a knowledge management solution is complex. Knowledge when applied in a process leads to better performance and the learning adds further to it. This decreases time and cost incurred next time, resulting in better quality products. The knowledge management solution or software generally comprises of three steps: input, process and output. For promoting the right knowledge transfer, people need to access new technologies and collaborate face to face or virtually (tools and systems). But on the other side, negative psychological and behavioural factors of the employees such as job insecurity, competition, fear of non-recognition and incompetence can jeopardize the knowledge sharing initiatives of the organisation (issues and constraints). Knowledge sharing culture can be built as part of a process in the induction programme, through internal newsletters, contests, events, employee development programs, trainings, rewards, and recognition programmes. The output that emerges is a reservoir of best practices and exists as a searchable resource. This will benefit the organisation in enhancing its productivity, quality of offering, and increase in market share thereby increasing profits and decreasing costs, refer Figure 3.

When an organisation becomes equipped to share expertise and know-how across the organisation, it helps practitioners: find, use, prioritize and share information, manage content securely, and make it available. They can assume that they have obtained expertise into saleable knowledge. Effective knowledge management allows people in an organisation to collaborate, communicate, and stay connected and up-to-date on relevant information in field. But all is not as simple as it seems. A couple of issues can crop up, which should be

Figure 3: The Knowledge Management Process



properly taken care of. These can be seen as the following challenges: 1) discovering and linking expertise, which involves difficulty in making real-time connections with experts. It may reduce value delivery and slows decision making. Employee turnover and an aging workforce can make finding the right resource even more difficult, 2) too much information, not enough contexts – absence of reliable sources, duplication and content silos may give hoards of information which is out of context. Practitioners may make better use of information when the information is organised effectively, 3) secured information sharing – content leakage and ineffective retention may carry risk for the organisation. Content needs to be protected as records, and 4) Common insights – geographic distances and conflicting classifications can hinder collaboration between teams and across organisations. Having tools that deliver results based on relativity and concepts help deliver and cross that divide.

To address these challenges, there is a need to adopt ways to manage expertise and its retrieval easily. The selection of the appropriate knowledge management tool becomes essential, which can address the challenges mentioned above and help accomplishing the task.

5. Knowledge Management Tools

There exist many knowledge management software tools which help organisations in managing their knowledge. A knowledge management (KM) software tool is able to automatically retrieve information from any source, internal or external, filter and structure incoming information into categories, accept manual information input using intuitive interfaces, alert users according to their preferences, mix information about people and information so that the knowledge available is transparently searchable, and provides different ways of searching, browsing and presenting information in order to suit different users. Discussion on few software tools that can be used for knowledge management is given below:

5.1. Microsoft SharePoint®

With Microsoft SharePoint Server 2010, knowledge management (KM) has become achievable, enabling organisational intelligence in the enterprise. SharePoint provides a wonderful repository and knowledge management atmosphere. It allows vast capabilities for document collaboration and content management. Microsoft's Enterprise Search, packaged with SharePoint, allows users to find documents regardless of their stored location. . It facilitates users move a completed document into the repository. It enables them to focus their time and efforts on the creation of intellectual property and not on the menial tasks associated with having to determine how to appropriately index and store the documents so that their retrieval is easy. Thus knowledge management is an achievable vision for organisations that are deploying SharePoint.

5.1.1. Tools for Students and Teachers-KM in Academics

There is a business case of an academic organisation, where the management wanted to provide students, staff, and parents with easy access to educational resources. The school implemented a web-based learning portal that is based on Microsoft SharePoint Server 2010. Through this portal, users accessed study materials, lesson plans, grades, schedules, and more anytime and anywhere. The portal gave users the ability to design, create, and manage their own sites, with very little technical help. Also, the students could rate portal content, which helps the organisation continue to improve its resources. Portal use has been high, and ready access to resources has contributed to a rise in student test scores, has helped organisation implement new programs, and has significantly streamlined development processes.

SharePoint Server 2010 includes many tools that have enhanced student and teacher engagement. SharePoint Server 2010 supports rich editing environments which students and staff can take advantage of, to quickly create their own content. For instance, a teacher can quickly edit and upload a lesson plan page, complete with a video relevant to the lesson. Multimedia file management is also simplified. Videos can be directly run in the browser rather than having to open a separate media-viewing application. Rich metadata tagging capabilities have made it easier for users to search for Information within the school's extensive collection. SharePoint Server 2010 also provides tools for students to tag, rate, and comment on content in the learning portal. Teachers can view the feedback and use it to develop new resources. Users of the learning gateway can also visit an individual's My Site, a personal website that provides students and teachers with a central location to manage and store documents and photos, contacts, and profile information and social networking tools, to see which content the student or teacher "likes" or has rated as potentially "useful" to others. The enhanced blog functionality of SharePoint Server 2010 also helps students and staff maintains blog sites more easily.

5.1.2. Benefits

According to the case the benefits offered by the knowledge management system are plenty. The SharePoint Server 2010 has taken the academic institution's functioning to the next level, adding features that help engage students and teachers in the learning experience. The solution helps monitor the effectiveness of teaching materials along with

Figure 4: Knowledgebase Manager Pro Dashboard

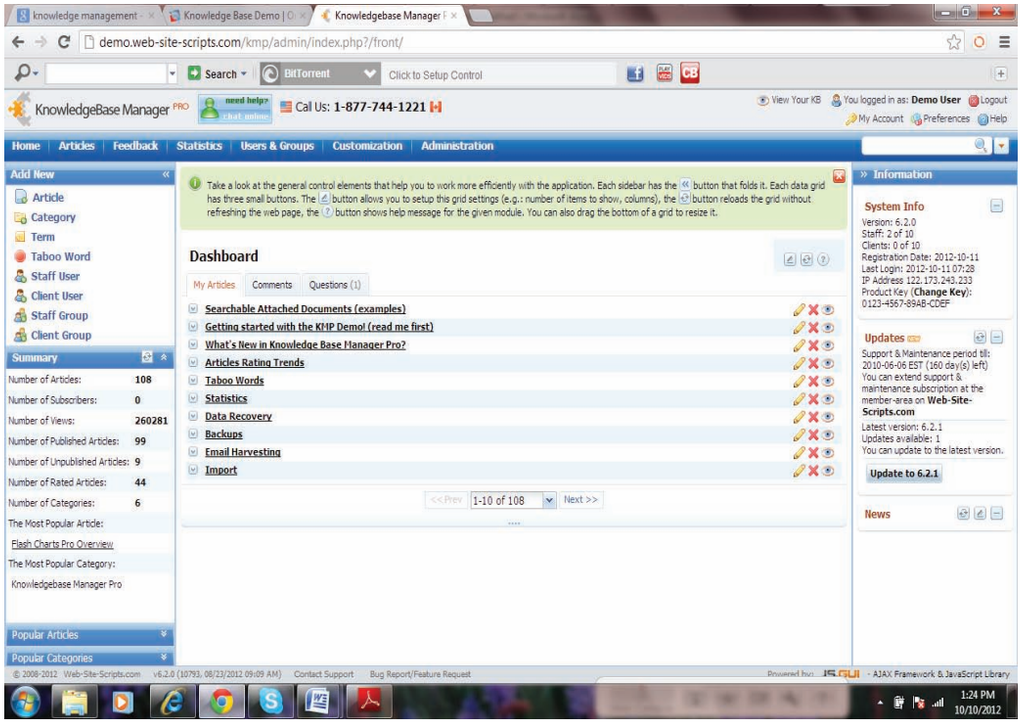
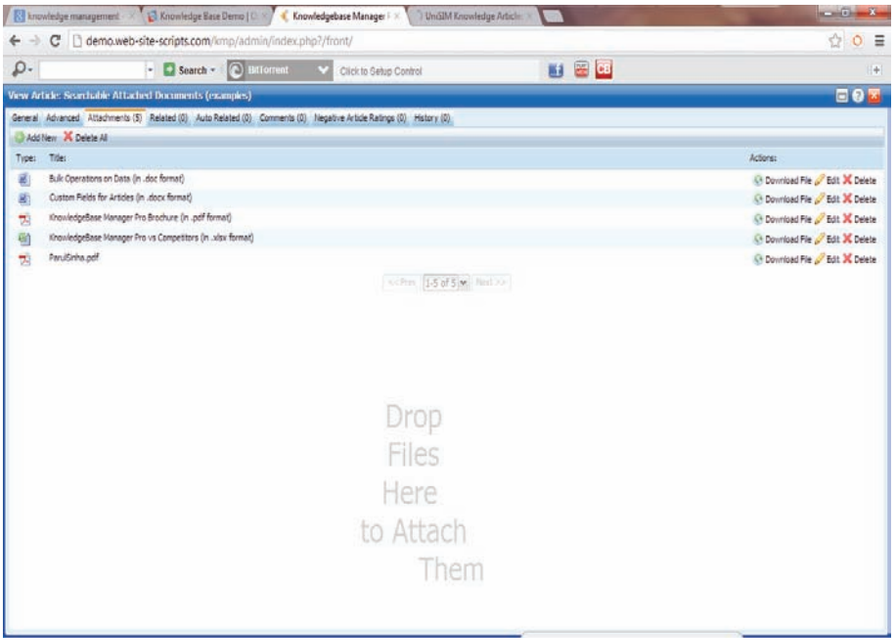
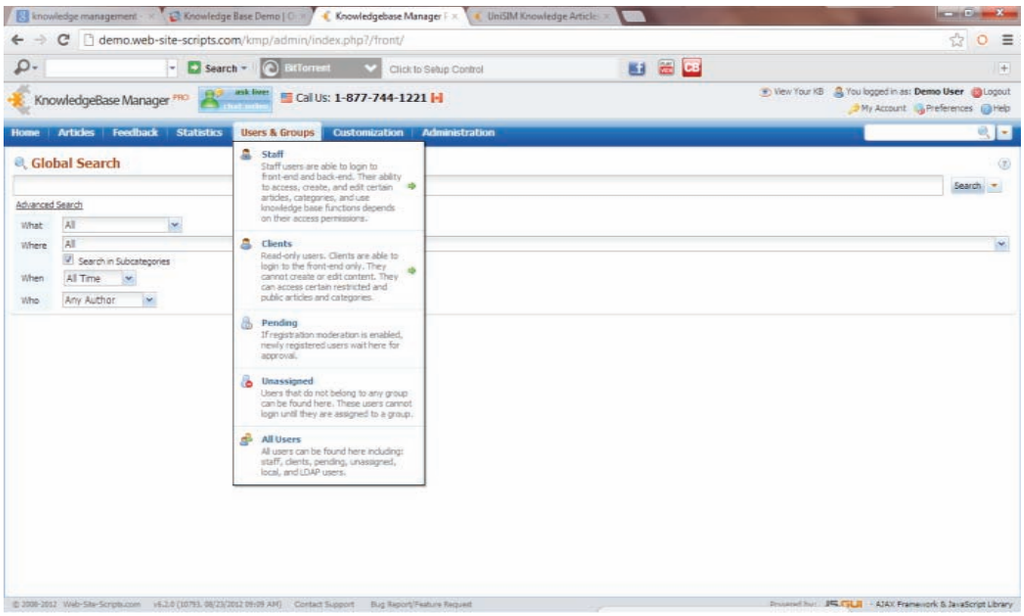


Figure 5: Adding Documents to Knowledgebase Manager Pro



several other academic and non-academic assignments. It enables the organisation to function more efficiently and reduce operating expenses. It supports learners in making greater progress, to allow teachers to be more efficient, and to improve communication among the broader community. SharePoint Server 2010 gives the power to provide better tools to shape learning. The tool has helped to improve the quality of the educational resources because it can take advantage of student feedback. They could identify the highest-rated resources and make them available centrally, and use them as models, in terms of format or structure—for developing new resources. Further, the remote access

Figure 6: Search option in Knowledge base Manager Pro



capabilities that SharePoint Server 2010 and Office Web Apps provide are of great benefit to the academic institution. Students could connect to resources instantly and easily, and accomplish more. They could access applications through the browser, without a need of software installed on their home machines. This removed many socio-economic issues. Office Web Apps also made it easier for educators to review student work. With Office Web Apps, students could work from their home computers, and create files in standard Microsoft Office document formats. SharePoint Server 2010 helps to strengthen the institution community, making it easier for students to connect with each other, with teachers, and for parents to fully engage in the learning process. Learning establishments could better connect through the collaborative tools in SharePoint Server 2010 which helps them to share ideas, vision, and resources. Development has also been more efficient with the SharePoint Server 2010-based environment. The custom coding has been reduced and hence build in modules can be used. Thus modifying and reusing to accommodate a similar process with slightly different requirements is easy. SharePoint Server 2010 is a continual evolving system delivering better educational resources.

Some other tools reviewed for knowledge management in business are "Knowledgebase Manager Pro" and "Interspire Knowledge Manager".

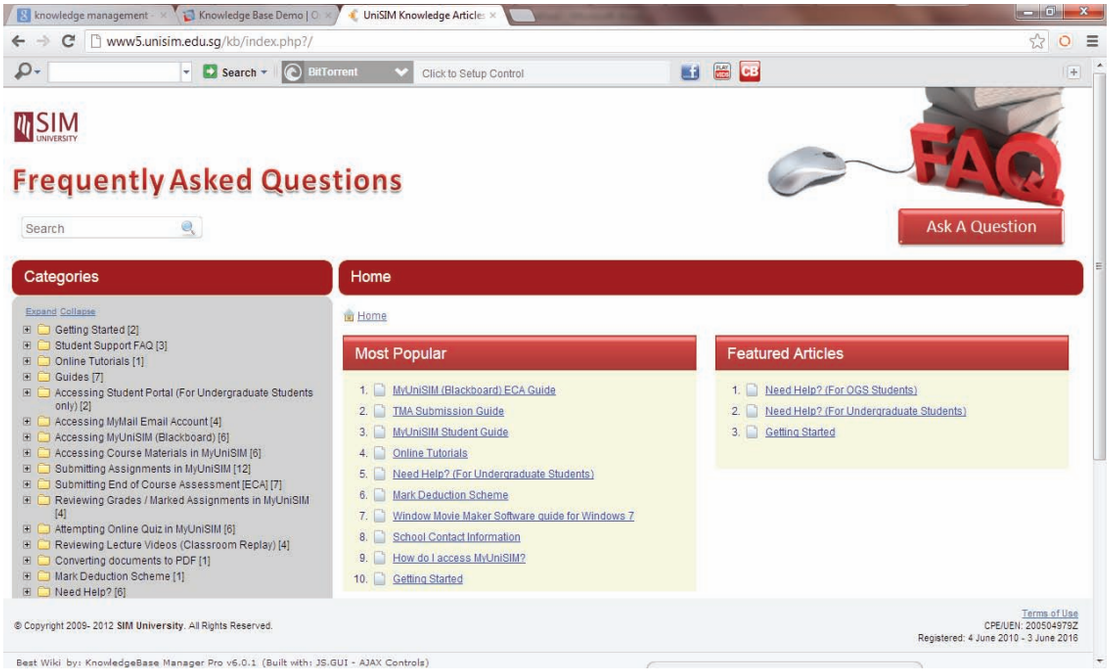
5.2. Knowledgebase Manager Pro

Web-Site-Scripts.com is a private web development company, specializing in web applications development. For knowledge management it has introduced a product which is "Knowledgebase Manager Pro". It is an IT-based system developed to support and enhance the organisational processes of knowledge creation, storage, retrieval, transfer, and application. It improves customer care, decrease customer support costs, help staff to find necessary information faster, improve decision-making process, increase efficiency of employees, and preserve integrity of corporate knowledge with Knowledgebase Manager Pro, refer Figure 4.

Some of its important features consist of: customizable and user-friendly interface, multiple knowledge base publishing options, and activities such as drag and drop of files from PC (personal computer) to the knowledge base, uploading documents just by dragging and dropping them, drag-and-drop of images and media files from a local folder to an article (refer Figure 5), embed image just by dropping it to an article, upload multiple attachments at a time, upload progress, categories now can be imported too, gather additional information user profile fields, custom return email for automated emails, optional logo resizing, performance improvement, installation wizard improvement and proxy support for updates.

The Knowledgebase Manager Pro offers the following benefits as a knowledge management software: 1) It keeps corporate knowledge usually diffused among papers, emails, files on server drives, and people's thoughts in one spot. While corporate knowledge management offers a new way of thinking about data organisation, its fundamental unit is still a document — and those documents need to be organised, allocated, shared and improved as they proliferate. 2) Knowledge Base Manager Pro features flexible category

Figure 7: Knowledge base Manager Pro in SIM University (accessed from: http://www5.unisim.edu.sg/kb/)



structure. It is easy to move categories within the tree by drag-and-dropping **(**refer Figure 5). Documents are hardly linked with categories, they can be reassigned at any moment or even there is option to assign document to several categories simultaneously. Flexible category and document access permissions scheme allows distribution of access rights among users. 3) Full search is enabled in both public and admin area. It is possible to search by any given set of custom fields. Advanced search helps to fine-tune and refine search results by providing additional depth – search in given categories, by certain parameters, by certain logic (all words, any word, exact phrase) etc., refer Figure 6. 4) Related knowledge is nicely organized**;** Knowledge Base Manager Pro features automated and manual linking of related articles. 5) Multiple files can be attached to knowledgebase documents. It is simple to upload and embed images, flash, and video on document page. Media files can be shared between articles or associated with some article only.

The software has been successfully implemented in many organisations; Figure 7 shows the case of an academic environment.

5.3. Interspire Knowledge Manager

Interspire is a privately owned company which develops content management, shopping cart, knowledge management, and email marketing software used by more than 40,000 organisations worldwide including fortune 500 companies (Intel, Shell, GE), enterprise organisations (Virgin, Ubisoft, Monster.com) and also thousands of small/ medium businesses and digital agencies. For knowledge management the software is known as Interspire Knowledge Manager which allows user to share information from their website or Intranet with an enterprise-grade knowledge base, reducing customer support, improving staff productivity and eliminating time wasted searching for information across disparate systems such as shared folders and paper documents.

6. Advantage of Knowledge Management Software

Knowledge management software helps make good use of a company's most important intellectual capital – the information possessed by employees. There is learning from experiences, some from self, some from others. New and existing employees acquire job knowledge faster, reducing training time and providing higher job quality. Corporate knowledge management systems allow employees and departments work more efficiently, avoiding re-inventing the wheel and reducing redundant work. Managing knowledge after implementing knowledge management softwares in company becomes much more systematic and manageable. Easy-to-use user interfaces, fast software engines, accessible knowledge management tools urge staff on adding of new documents. Starting from the moment when a software implementation takes place; gradually it becomes centralized storage of knowledge; everyone contributes to knowledge base development. According to Ernst & Young consulting

agency research, knowledge management software usage enables up to 30% savings on customer support, escalates up to 50% decision-making quality, staff agility, and company reaction speed to changes of market needs, leading to the new products development cycle decrease by 20% in average.

The advantages of web-based knowledge management software can be listed as: customer care improvement, 2) customer support costs decreasing, 3) staff is able to find or receive necessary information faster, 4) decision-making process improvement, 5) employees and departments work more efficiently, 6) better communication and collaboration among staff members and groups, 7) retention of intellectual property, 8) reduce employee training time, and 9) knowledge accumulation and usage is a key to business success.

7. Conclusion

The proper alignment of the company strategy and knowledge management strategy is important for obtaining competitive advantage. The integration of knowledge management and business is essential for every successful company. Both large corporations and small business need to identify and appreciate the role that knowledge management can play to enable them to succeed. KM tools can help them maintain the market leverage, battle inertia, and obtain resources at their capabilities. They have to be much more flexible, more responsive, and make more effective decisions — because even small mistakes made today can prove fatal to them in future. And this is where business knowledge management software can create miracles. Numbers of factors highlighted in the paper illustrate the relevance of the usage of knowledge management in business. When marketplaces are increasingly becoming competitive, the rate of innovation is rising, and there is reduction in staff retention, an urgent need arises to tap in informal knowledge with formal methods, and the amount of time available to experience and acquire knowledge has lessened. Knowledge management is an engine that transforms knowledge into business value. Thus Knowledge management as a notion is very attractive and provides massive business opportunities that should not be missed, so the organisations have full opportunity to embrace it and absorb it in its practices and procedures. But they should also look into various issues and challenges such as organisational culture, strategy, information technology, knowledge organisation, and adopt appropriate techniques and tools as mentioned in the paper to overcome them.

The paper discusses some KM software tools which are materializing the concepts and theories of KM in a physical form. The tools have given a tangible shape to an abstract term such as knowledge. The discussion on the three tools along with the screenshots of the demo version of KM software gives an indication to the ways in which a KM tool can benefit a business process .Also the paper highlights that along with industry, the academia also has significant opportunities to apply KM practices in their processes. As the education industry is growing along with the rising stakeholder demands for excellence, the paper presents enough examples for Education Industry to adopt the practices as an excellence tool.

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