Sharing of information and knowledge among staff in
King Abdullah University of Science and Technology
(KAUST) library.

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Abstract

This paper describes strategies and initiatives undertaken by the King Abdullah
University of Science and Technology (KAUST) library in sharing information and
knowledge among its staff. KAUST Library adopted several IT platforms to enable
staff to contribute, share, collaborate, extract and act upon knowledge in order
to serve our users better. They include: Sharepoint and Google Docs. As Duffy
(2000) stated, that “success depends on capitalizing on every available resource
including what a company knows and how it uses what it knows”. Therefore, to
provide value-added services to our community of researchers and
academicians, library staff needs to be equipped with the right skills and tools to
be able to act upon users' inquiries and information needs.

KAUST library which was opened in Aug 2009 aims to support education and
advanced scientific research. With its state of the art learning and information
resource center, the library provides instructional assistance and reference services to its research and academic community. With the influx of information coupled the pervasive use of information technology and Web2.0, the library has to grapple with the issue of information overload. It is important to be able to sieve through the rubbles of information to apply the relevant ones during the point of transaction.

Based on our experience in using various IT platforms, this paper will share the impacts of such tools. Lessons learnt and future directions in this area will also be discussed.
Introduction

Information and Knowledge Management are imperative to the success in any organization. As (Duffy, 2000b) stated, that “success depends on capitalizing on every available resource including what a company knows and how it uses what it knows”. Libraries are no exception too. The benefits of sharing and exploiting the available knowledge far outweigh the retention and hoarding of information and knowledge. By sharing, information professionals could perform better, learn from mistakes and even invent new ways of solving problems.

The tasks undertaken by librarians and information professionals are important not only to users but to the internal library staff. These tasks include "information searching, selecting, acquiring, organizing, preserving, repackaging, disseminating and serving" (Lee, 2005). The end-products must be documented and shared among staff. In addition to that, there should be a common platform for the ease of search, retrieval and dissemination among staff. These end-products could then be used by the library staff to serve users.

Just how important information and knowledge sharing is and what are the impacts it have on an organization? This paper attempts to describe the journey that KAUST library took in their quest of sharing information and know-how among its internal staff.
Data, Information and Knowledge

Data, Information and knowledge both do not carry the same weight. (Bellinger, Castro, & Mills) stated that “data represents a fact or statement of event without relation to other things” while knowledge is the representation of a “pattern that connects” in addition to providing a “high predictability as to what is described or what will happen next” (Bellinger, et al.). Wisdom is the “understanding of fundamental principles embodied within the knowledge” (Bellinger, et al.). On the other hand, Lee presented that data is “scattered” and “unrelated facts”; information to being “selected, organized and analyzed data” (Lee, 2005) while knowledge to “information combined with users’ ability and experience that is used to solve a problem or to create new knowledge” (Lee, 2005).

It is also interesting to note that knowledge can be categorized into 2: explicit and tacit. In their article, tacit knowledge is knowledge that exist in an individual and difficult to “externalize” (Erden, von Krogh, & Nonaka, 2008). It is something that an individual learn and experience over a period of time. For example, it could be a process that the individual took to solve a problem using his cognitive skills and tools available. Upon resolution, the person is able to identify the best possible method to resolve such issue and apply it again when similar situations arise. If this particular knowledge (tacit) is not captured or documented in any form, it will be a lost to a particular organization. The situation can worsen especially when the individual leaves the organization.
Explicit knowledge is knowledge that has been “documented and public, structured, fixed-content, externalized and conscious” (Duffy, 2000a). Thus, to elaborate further, organizations need to capture these knowledge using available systems either manual or electronic and provide a mechanism to access and retrieve such knowledge when situation warrant.

**Knowledge Management and Libraries**

There have been numerous definitions and explanations on knowledge management. Townley describes knowledge management as “the set of processes that create and share knowledge across an organization to optimize the use of judgment in the attainment of mission and goals” (Townley, 2001). He added that it encapsulate the attainment of knowledge from various sources such as products, customers, competition and customers and disseminate these knowledge among the relevant and key personnel within the organization. (Townley, 2001).

Duffy stated that the phase knowledge management is used to describe “the process of locating, organizing, transferring and using information” (Duffy, 2000b). It is imperative for the storage, retrieval and dissemination of knowledge. As described before, knowledge often resides in the head of talented individuals within the organization. (tacit knowledge). This knowledge needs to be processed (externalization) either by documenting it or storing it in soft or hard copy so that others are able to use it to greater effect. Sharing should not also be limited to geographical factors.
So how does knowledge management become important in a library setting?

Shanhong (2002) in his article stated that:

Knowledge management in libraries should be focused on effective research and development of knowledge, creation of knowledge bases, exchange and sharing of knowledge between library staffs (including its users), training of library staff, speeding up explicit processing of the implicit knowledge and realizing of its sharing. (Shanhong, 2002)

One of the points mentioned above is the "exchange and sharing of knowledge between library staffs" (Shanhong, 2002). For the library to be able to serve users effectively and productively, they will need the skills, knowledge and know-how to respond in a just-in-time manner. The culture of sharing knowledge must be cultivated within the library organization. As Shanhong stated, there must be a culture of "mutual trust, open exchange, studying, sharing and developing knowledge operation mechanism of libraries".

Davenport et.al. added that the culture should exhibit several criteria such as

- Positive orientation to knowledge
- No restrictions in knowledge sharing
- Fits with the existing culture (Davenport & Long, 1998)

People are the main focus of this issue. Without the correct attitude and participation plus higher management support, any knowledge management
project will not have much success. Talent should be nurtured and rewarded accordingly. Skill retention and training are paramount.

**Information Technology**

Information technology is one of the key enablers in any knowledge management project. Cultivating culture alone is not enough to ensure the success. Duffy mentioned that “technology is fundamental to the knowledge management processs” (Duffy, 2000a). She added that in addition to technology and people, 2 other factors also crucial components within the knowledge management that is: strategy and process. (Duffy, 2000a).

Shanhong stated that “application of information technologies enlarges the scope of knowledge acquisition, rises knowledge acquisition speed and reduces knowledge acquisition cost” (Shanhong, 2002). Thus, by sharing using some medium, for example IT, it enhances the ‘just-in-time- factor element within the KM process. Speed is essential as users are demanding that they obtain information within a short period of time. This is especially so in a research intensive environment where timing is crucial.

Information Technology, in a KM context, would comprise of some technological infrastructure that facilitate the fast storage and retrieval of information. Repositories are one such example where data and information can be stored in massive amounts. This could then be channeled to users via a push technology whenever necessary.
KAUST and the Library

Before describing our initiatives on information and knowledge sharing, it would beneficial for the readers to understand the set-up and background of the library and the university. King Abdullah University of Science and Technology is a graduate research university that focuses heavily on the “significant contributions to scientific and technological advancement”. (King Abdullah University of Science and Technology, 2010a). Specialization areas include: Chemical and Life Sciences and Engineering, Mathematical and Computer Sciences and Engineering and Physical Sciences and Engineering” (King Abdullah University of Science and Technology, 2010c). Altogether there are eleven fields of study as stated below:

1. Applied Mathematics and Computational Science (AMCS)
2. Bioscience (B)
3. Chemical and Biological Engineering (CBE)
4. Chemical Science (ChemS)
5. Computer Science (CS)
6. Earth Science and Engineering (ErSE)
7. Electrical Engineering (EE)
8. Environmental Science and Engineering (EnSE)
9. Marine Science (MarSE)
10. Materials Science and Engineering (MSE)
11. Mechanical Engineering (ME)

(King Abdullah University of Science and Technology, 2010b)
KAUST library was opened in August 2009. It aims to support education and advanced scientific research. With its state of the art learning and information resource center, the library provides instructional assistance and reference services to its research and academic community (Branin, 2010). The staff strength has steadily grown from less than 10 to close to about 20 now. (at the time of writing). All of the staff comes from different walk of life and academic background. It comprises of the senior management, subject librarians, specialists and library assistants.

**Project background**

The increase in the number of information requests for assistance and inquiries has shown the importance of knowing how to resolve users’ information needs. Requests range from where to locate for library materials, how to use a particular electronic resources as well as using the citation management software (Endnote), among others, are becoming more and more frequent. Staff would need to know where to locate information in order to solve these inquiries.

One of the challenges that KAUST library is currently addressing is to know where to find the information to resolve the users’ problem. Most of these information are located in disparate ‘locations’ such the laptops of the librarians and specialist, which are inaccessible by all except the computer owners. There is no one centralized ‘area’ or holding center where relevant library staff can get access. Most often, library staff communicates by emails or approaching the relevant staff to get the desired information. This process is rather cumbersome
and not productive. In certain situations, for example, when the relevant party is on long vacation or attending official business meeting, the requester would need to email them in the hope that they get some replies. Otherwise, they may have to approach other library staff.

**Google Docs**

This scenario has driven library staff to seek a better and more effective way to getting to these information and knowledge. One platform chosen by the library was Google Docs. As our university had already established an account, our library decided to use it as a testing ground to store / share information.

**Visitors count**

Visitors count was done manually by the Information Desk. Staff had to enter the number of library visitors during specific periods of time (during business hours). Often, staff had to write down on a prepared document. At the end of every month, a designated library staff would gather all of these information and compute them into an excel spreadsheet. It was an arduous and meticulous task.

We decided to use Google Docs to capture and store all of these data. A library account was created. All the fields were entered into Google Docs just as it was in the prepared document. Desk staff would log into this account and access the document. All data were entered and saved at the end of each day. Backup copies were downloaded. Monthly calculations were done using the
available features in Google Docs. The designated staff could do this in a shorter period of time.

One of advantages of this was that a number of staff can access at the same time and get the information instantly. This facilitated the sharing of such information among library staff who wanted to know the number of library visitors for every month as well as the peak period of high library visits. Library management is able to cull the information for statistical purposes.

Figure 1. Main content page of Google Documents.
Textbook Distribution

Another example where the library decided to use Google Docs is the distribution of library textbooks for the students. In this scenario, a spreadsheet that contains information such as course name, number, professors’ name, textbook title, costing and inventory were created. The purpose of this document is to facilitate the sharing of real time information of the number of books that has been requested and collected by students.

4 library staff was assigned to track the real time transactions of the course textbooks. Updates were done in Google Docs where the manager was able to track and see how many books have been requested by the students. It also serves as an indicator if the availability for a certain title is running low.
We noted that:

- Concurrent users are able to login, access and update the information
- Calculations can be done immediately
- Downloading allows back-up copies to be made
- Process is not hindered by geographical factors, updates can be done anytime and anywhere

Figure 3. Spreadsheet showing the inventory checklist for textbooks
Google Docs – Our concern

After careful consideration, we decided against putting up sensitive and internal information via Google Docs. As the mentioned by Seth Weintraub in his blog, “Google Docs sharing issue causes concern for cloud computing”, we were concerned with some loopholes that were discovered such as the sharing rights of documents (Weintraub, 2009). We have to extra careful when storing and disseminating such information within internal library staff.

At around the same time, we were informed by the University IT department, that our library has access to campus Sharepoint portal. This portal has already been used by several other faculty members and departments. We decided to investigate and learn more about the functionalities of the software.

Microsoft Sharepoint

Microsoft Sharepoint is a very powerful tool that assist in “content management and enterprise search” as well as “facilitating information sharing across boundaries” (Ennis & Tims, 2010). One of the advantages of it is the seamless integration with other Microsoft products which the KAUST library is also using for example: Outlook, Word, Excel and Powerpoint.

First Phase

After our meeting with a representative from the University IT, we were given a space on the Sharepoint portal to accommodate our files. During that meeting, the library representative outlined the aim and objectives of using Sharepoint as
well as inquiring the features that could support the purpose of using the platform.

One of the earliest implementation was to create an information repository for important documents that needs to be retrieved by library staff. Upon identification of the documents, management needed to decide on the content rights management. Several points, among others, need to be considered such as

- Who should have the rights to upload
- Who should have the rights to delete
- Who should have the rights to edit and upload
- Who should have view only the files
- Who should have view to certain folders

It must be stressed that the audience for this portal site is strictly for the library staff. The aim of the portal is to store the important documents and allow for the search and retrieval of them. The first phase of the implementation comprised of uploading documents on electronic resource management, library policy documents, training slides, library announcements and several project implementations documents such as digital library implementations.
As resources for this project was limited, the library did not invest much into the growth of this site. One of the reasons was the implementation of the digital library website (around the same time) that was a top priority for our library. However, once the library has completed the implementation of the digital library, attention was once again reverted back to Sharepoint.

**Second Phase**

The second phase of the implementation involved much more planning and research work. Literature reviews were conducted to study how Sharepoint can be exploited much further than the current use. An example of Sharepoint
implementation was written by Ennis and Tims. One of the major considerations is the design of the Sharepoint portal of the library; it must be flexible yet allow for growth (Ennis & Tims, 2010).

Organization and Architecture of the library portal must also be addressed. The ordering of the folders and files or the hierarchical organization should be catered to the information needs of the library staff. This would allow for fast and easy browsing. Some of the issues that need to be considered is whether to organize the information by function, tasks or organization.

On top of that, Sharepoint has features such as single sign on, “granular permissions”, targeted content, searching feature and personalized features. We can “assign different levels of permissions to different people all the way from full control to read only” (Ennis & Tims, 2010). This would allow only relevant library staff to access and amend certain documents. The targeted content feature allows you to “push content to different people or groups using permissions” (Ennis & Tims, 2010). Selected library staff will be informed of any new developments to information contents. Search feature allows users to search the entire portal or limit to a particular site. Users also have the freedom to arrange the layout (look and feel) of their own space.
Third Phase

At the time of writing, we have just completed the literature reviews. The next phase will be outlining the major tasks that we need to accomplish. Below are the major initiatives which we plan to conduct based on what Morville and Rosenfeld had wrote:

1. Reviewing the target audience, existing information architecture of current Sharepoint portal as well as the content.
2. Designing the new portal which will include “creating detailed blueprints, wireframes, and metadata schema” (Morville & Rosenfeld, 2007)
3. Implementation of the new site where designs will be shown to the intended audience, tested, evaluated and launched.

4. Administrating the entire site. Upon implementation, the library will designate certain individual(s) to maintain the site and ensure that a periodic schedule of evaluation and improvement is conducted. Some of these tasks would also include “daily tasks of tagging new documents and weeding out old ones” (Morville & Rosenfeld, 2007). It also entails the staff to monitor the portal for their usage and respond to users feedback (Morville & Rosenfeld, 2007)

One of the important points to note is to get higher management support for the entire project. Presentation and personal one-to-one meetings with the library director and the management team will be conducted. They will need to be briefed on the aims and objectives of the project. Points that need to be considered during these meetings would be:

- Goals
- Benefits
- Schedule and budget
- Resources needed
- Content creation and maintenance
- Delegated library staff and their long term roles
- Technical feasibility
The next steps

The previous section describes the main stages of the project. We noted that one of the areas of focus will be the revamp of the information architecture of the entire Sharepoint portal. We will also need to design it in such a way that it is user friendly and easy to access by library staff.

Review Stage:

During this stage, we will identify participants for our testing. This will involve several library staff from different departments. We intend to conduct focus groups and elicit information from the users themselves. Users will be asked on their perception of the existing portal as well as getting their suggestions on how we can improve the existing portal (Morville & Rosenfeld, 2007). We also intend to conduct one-to-one interviews with the management team as well. Some of these questions will be based on their information use as well as their capability to exploit Sharepoint.

Design Stage:

Before coming up with an information architecture blueprint, we would be conducting a user testing – card sorting exercise. Spencer stated that “card sorting is a quick, inexpensive, and reliable method, which serves as input into your information design process” (Spencer, 2004). She added that the testing can assist in coming up with an overall information structure as well as suggestions for navigation and menus (Spencer, 2004). We will be conducting
both open and closed card sorting. As outlines by Spencer, below are the explanations for both open and closed card sorting exercise:

- **Open Card Sorting:** Participants are given cards showing site content with no pre-established groupings. They are asked to sort cards into groups that they feel are appropriate and then describe each group. Open card sorting is useful as input to information structures in new or existing sites and products.

- **Closed Card Sorting:** Participants are given cards showing site content with an established initial set of primary groups. Participants are asked to place cards into these pre-established primary groups. Closed card sorting is useful when adding new content to an existing structure, or for gaining additional feedback after an open card sort. (Spencer, 2004).

Results will be documented and presented to the stakeholders. The results will also be used in designing the information architecture of the site.

**Implementation Stage:**

Information architecture of the site will be based on the card sorting results as well as focus group study. Labels and the information structure will be improved upon results and suggestions of the findings. The newly look website will be shown to the library staff and further usability tests will be conducted to identify any flaws or weakness in the prototype design. Amendments will be made until the site has meet the expectations of the library staff.
**Administrative stage:**

After the implementation of the new site, we will need to dedicate a small team of library staff to maintain and oversee the logistics part such as tracking usage statistics and handling users' feedback. A large portion of the time would be on training or re-training the library staff on using the new Sharepoint site.

**Conclusion:**

Knowledge management projects are tedious and needs constant supervision. Higher management support is very much needed to sustain the drive. Motivation is another factor: how to get the users themselves to contribute to the knowledge base despite their hectic daily schedule. As Davenport et al. mentioned, some the factors that can determine the success are: “linking to economic performance / value, knowledge-friendly culture, clear purpose and language and senior management support” (Davenport & Long, 1998).

Although KAUST library's KM initiative has still a long way to go, we are targeting that the Sharepoint site would be a repository where library staff could store, search and retrieve the relevant information to serve our community better. We are also looking to integrate, in the future, the other Library 2.0 tools available within Sharepoint with the digital library system.
References:
Duffy, J. (2000a). Knowledge Management To Be or Not to Be? The Information Management Journal.