Capturing and Managing Email Knowledge

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Abstract

In many successful organisations today, significant resources are invested in training and development efforts exploring group dynamics and effective team building. The challenge from a knowledge management perspective is to explore how technology could facilitate knowledge sharing (both tacit and explicit) in a group context. The paper highlights the benefits of developing such Knowledge Management tools to make better use of the information contained within email messages, and shows how organisations could become more effective by adopting such an application.

Keywords: Knowledge Management, Electronic Mail, Email Management

Introduction

Knowledge Management (KM) is currently a buzz-phrase that it starting to occur more frequently in many publications and conversations, yet it is a phrase that has been around for years. In the years leading up to 2003, KM has been going through phases of maturity. The first phase was inward-looking, focusing on productivity issues - "How can we use IT systems to prevent reinventing-the-wheel?" This phase started around 1992 and created a multitude of project databases, best practices databases, Lotus Notes installations etc (Sveiby, 2001). The second phase was similar but with a customer focus on "How can we leverage what we know about our customers to serve them better?" and at the time data warehousing was the theme of the day. The trouble with the early installations was that all they did was to create massive data and text archives of dubious value and all passive and no interaction (Sveiby, 2001). The third phase is where we are now (1999- 2002) and interaction has reached the surface with interactive IT web pages, e-business, e-commerce, on-line transactions etc. This phase has created a lot of enthusiasm and witnessed the hyped valuations of the "dot.coms" during 2000. The next phase is in the realisation that the key to unlocking the value of Knowledge is people and to support them technology.

In order to achieve the next phase, many successful organisations today invest significant resources in training and development of efforts into exploring group dynamics and effective team building. However, despite these efforts, the impact of many human resource interventions can become short lived as group members return to old attitudes and patterns of behaviour. This paper highlights the benefits of

creating a Knowledge Management tool which is already incorporated into an employee's everyday working habitat, to avoid them having to change their ways to accommodate their management of knowledge.

## Accessing and Distributing Knowledge

Knowledge needs to be distributed and shared throughout the organisation, before it can be exploited at the organisational level (Nonaka and Takeuchi, 1995; Bhatt, 2000). In many KM frameworks knowledge distribution takes the form of enterprise-wide knowledge sharing programmes, developing communities of practise, attempting to adapt to the organisational culture and converting tacit into explicit knowledge. Some classic methods already exist for delivering new knowledge to staff such as organising frequent re-training and keeping procedural documents up-to-date. However these only cover the distribution of explicit knowledge, as tacit knowledge is harder to communicate via training or by converting to an explicit form. So how can we actually deliver *relevant knowledge* to people without going through the lengthy and often error-prone process of tacit-to-explicit knowledge conversion? The answer perhaps lies in on-demand expert advising. Utilising *expert-finding tools* may be a potential method for accelerating knowledge acquisition and distribution. Rather than spending time converting tacit into explicit knowledge, why not attempt to connect people to experts faster and easier. The goal is to place every person in the organisation within one phone call of an expert (Morey, 2001). This means direct contact with expertise and therefore accelerated on-demand knowledge distribution. Many companies such as Hewlet-Packard, Microsoft and the National Security Agency (USA) have successfully implemented expert-finding tools (Becerra-Fernandez, 2000). It might be argued that avoiding the tacit-to-explicit conversion there is a danger of loosing essential knowledge if a member of staff leaves the company. On the other hand, by creating the grounds for easier access to human expertise it is possible to create a situation where more than one person within the organisation possesses specific knowledge.

Capturing and Managing Electronic Knowledge

It has long been clear that email is more than just a simple communication system (Mackay, 1998 and Whittaker 1996a). Email has become a central element of the way work is conducted in organisations where computers are used. It is now the source of many different office tasks, serving as the place in which work is received and delegated (Whittaker, 1996b). For today's computer user at work, email is much more than an ordinary application. It has become a part of the working habitat (Bellotti, 2000). Today there are currently 34 million people in the US that have access to the Internet (Nua Internet, 2002). The International Data Corporation (IDC) has predicted that 35 billion emails will be sent every day by 2005. At the end of 2002, the figure stands at 14 billion. IDC's Email Usage Forecast and Analysis report further estimates that the number of emails sent annually in Western Europe will be 1.6 trillion in 2005 (Mahowald ,2002).

To date the information contained within email messages is only known to the sender and the recipient. However, much of this information would be beneficial to other

individuals within the organisation. As part of a wider research programme at Loughborough University, knowledge management techniques are being developed to enable organisations to capture potentially useful information sent within emails. Currently researchers at Loughborough University are developing an Email Broker system, as shown in Figure 1, to not only manage knowledge, but also to aid employees to become more efficient when dealing with email.
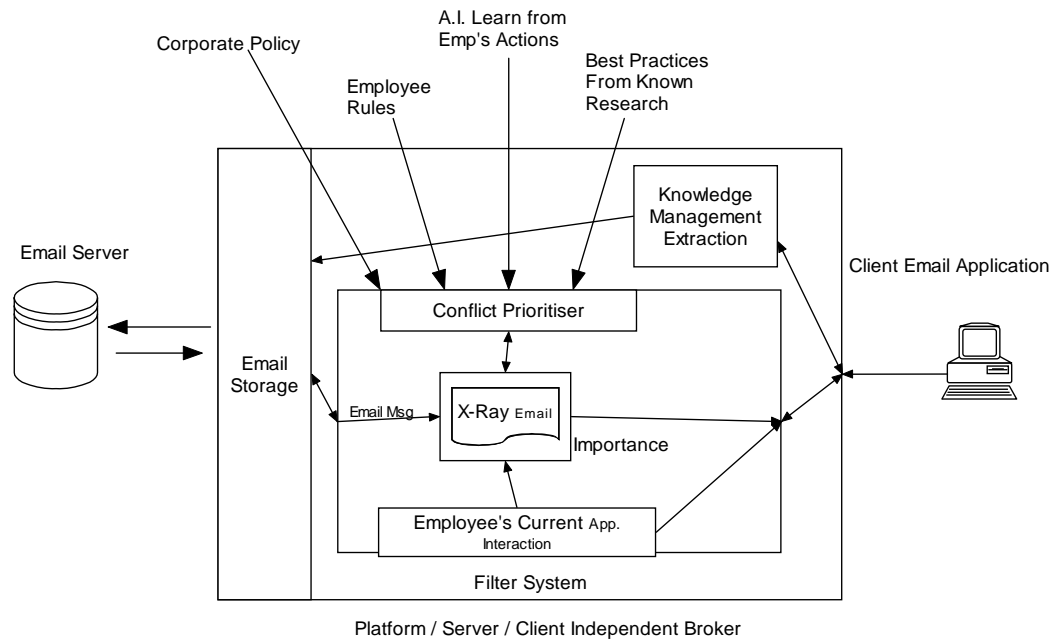
Figure 1 – Email Broker System

Figure 1 consists of two major parts, the Intelligent Email Classification and Notification Management System and the Knowledge Management Extraction System. Firstly, looking at the Intelligent Email Classification and Notification Management System, there have been many reports in recent years that have highlighted concerns with the amount of email and instant messages received and the problems organisations face in the future. Employees not only have to deal with many emails and instant messages a day from fellow co-workers but they also have to manage unwanted email, spam. Nearly 15 percent of emails received each day by US firms contain spam, according to a new survey from the email security company. However, an inability to define what constitutes spam is causing companies problems, the study found. Around three-quarters of respondents in the US predict that spam will be a bigger problem in the year ahead, while just one third of respondents said that unsolicited email wasn't troublesome at present. However, 58 percent of companies said they didn't want to get rid of spam altogether but needed a way to filter relevant emails from unsolicited ones (Jackson et. al., 2001).

The emails and instant messages that an employee can receive can range from highly important business messages to spam. At present, regardless of the content of the electronic message, employees are still interrupted which can effect the quality of work and productivity. To improve employee efficiency within the office there is a

need to reduce the amount of distractions and when possible eliminate distractions until times of convenience. In some recent research undertaken by the authors it was discovered that the majority of employees have their email application set to check for email every 5 minutes (Jackson et. al., 2003). The research by Frazee (1996) showed that some employees could receive up to 100 emails each day. With the majority of employees having their email application to check for email every 5 minutes over an 8-hour day, this means that in the worst case these employees could have 96 interruptions in the day. To overcome this potential problem, employers could set employee's electronic message applications to check for messages every 45 minutes to reduce the amount of email interruptions, but of course employee's can override this, defeating the objective. However, more importantly for the more cautious users who do not want to override the system in place, business messages might not be delivered in time for necessary and appropriate action. To solve these problems the next generation of electronic message applications need to be more sophisticated and this is why the Intelligent Email Classification and Notification Management System (IEMS) using Pattern Recognition is being developed at Loughborough University. The IEMS will determine the importance of an email and when the email message should be delivered to increase employee effectiveness and efficiency.

The second part of the Email Broker System is the Knowledge Management Extraction System. The purpose of this system is to scan emails before they are sent within an organisation, picking out keywords and then storing them into a database. However for ethical reasons, it is intended that the sender of the email will have the option not to store the selected keywords into the database. The KM Extraction System is a complex sub-system of the Email Broker System and the success of the system will depend on its ability to determine useful keywords from a body of email text or HTML that summarises the email in the most effective way that will benefit the organisation. The KM Extraction system will also store the sender's name, the recipient's name, the date and time of when the email was sent so that when the keywords that are stored in the database and then are accessed by other members of the organisation, they will be able to contact the relevant member(s) of staff who hold pertinent knowledge.

Making the Most of Knowledge

The second part of the KM Extraction System involves developing a graphical user interface search facility that will be used as the front end. The search facility will enable users to search for keywords to discover who has communicated about a topic and more importantly who within the organisation has knowledge about the topic. Figure 2 shows a screen shot from a web site called Kartoo.com. It is envisaged that a similar front end will be developed for the KM Extraction System The graphical front end will represent the findings of the search through mapping the occurrences of the keywords into spheres. As shown by figure 2, the size of the sphere represents the number of times the keywords have been used within emails by a particular sender (in Kartoo's case a web page). Linking the majority of spheres together are lines with keywords.
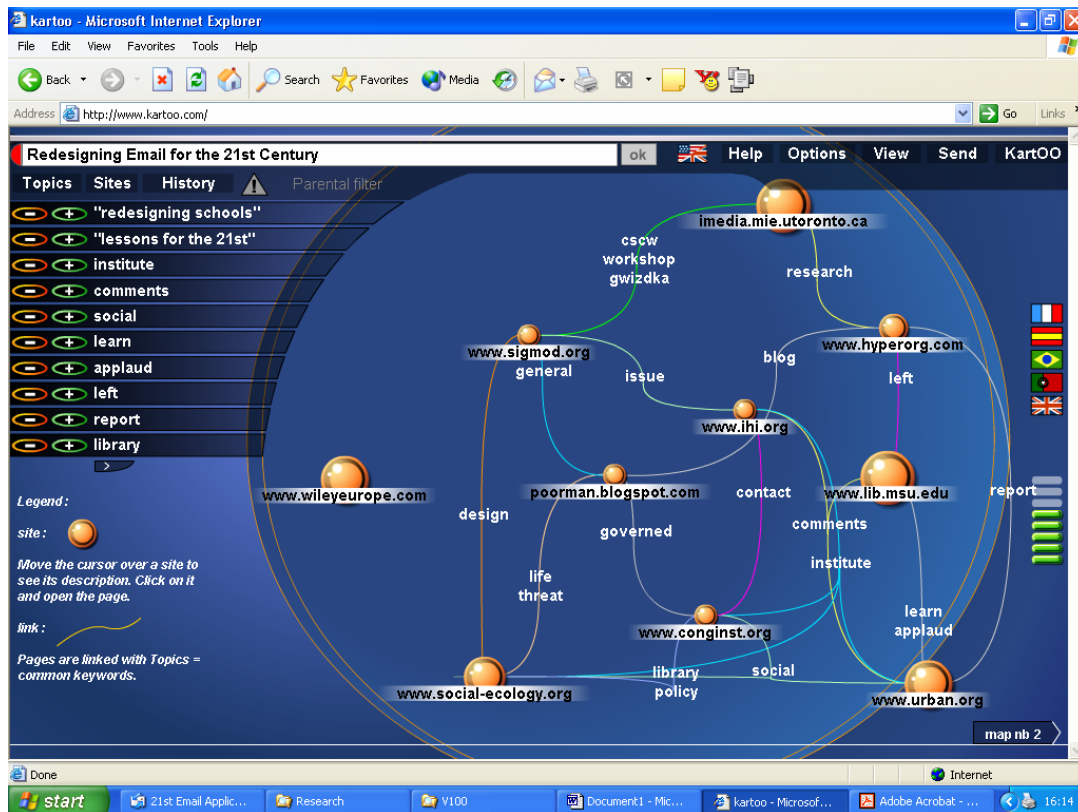
Figure 2 – Screen Shot from Kartoo.com

The keywords on the lines give more information about the link between the spheres. By clicking on the sphere, contact details of the knowledge holder will be shown to the end user querying the system. The user querying the system can then contact the knowledge holder to increase their knowledge about a specific area. Again, the success of the application depends on depicting keywords from an email and the willingness of the sender to share those keywords with the community.

Summary

The paper has outlined the future work that is to be undertaken by the authors and some of the benefits of developing Knowledge Management tools to make better use of the information contained within email messages. Combing both the Intelligent Email Classification and Notification Management System and the Knowledge Management Extraction System, to form the Email Broker System, should enable organisations who adopt the system to become more effective and efficient in overall business processes through aiding their employees to become more productive.

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