

# **EXPERTISE PROFILING: IS EMAIL USED TO GENERATE, ORGANISE, SHARE OR LEVERAGE KNOWLEDGE**

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## **ABSTRACT**

The use of electronic mail (email) in organisations began as an informal tool of communication. However, over the years its use has evolved making it the communication medium of choice for most businesses. As email use continues to grow, an analysis of its use and implications are of particular interest. In this paper, the authors venture to gain a better understanding of email content. Specifically, the paper questions if employees share knowledge in email. Furthermore, it probes whether it is possible to profile employees' knowledge from the emails they send. The research results yielded two important findings: (1) respondents gave a highly positive response towards the extent to which they utilise email to help generate, organise, share, or leverage knowledge within an organisation; and (2) email content provides sufficient detail to enable the location of key human resources that can aid in decision making.

## **KEY WORDS**

email, knowledge management, knowledge sharing, expertise discovery, decision making.

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## **INTRODUCTION**

In working environments, people are put in situations where they need to make a decision or look for some information to resolve an ambiguity or a complexity. Conventional techniques for finding the right information such as databases, information retrieval systems, and web searches engines partially address this problem. Often, however, these techniques are time consuming and yield unreliable results (Yimam-Seid and Kobsa, 2003, Yu and Singh, 1999). Early studies on information seeking behavior show that people searching for information prefer asking other people for advice than searching through a manual for information (Bannon, 1986). The issue is then searching for the right piece of information by searching for the right person. This has led to the interest in systems, which connect people to others by making people with the necessary expertise available to those who need it, when they need it.

According to Bontis et. al (2002), the body of data and information lying dormant in e-mail systems, when utilised properly – through indexing, profiling and categorising – has tremendous potential to create new organisational knowledge, and therefore, to equip employees with the resources they need to find information. Bontis et. al (2002) argue that email can be construed as a proxy for codified knowledge flow in organisations. Their research focuses on emails enormous potential value for perpetuating organisational knowledge. Bontis et. al states that despite the fact that email is limited in its capacity to transfer tacit knowledge from person to person, emails ability as a vehicle of explicit knowledge flow to amplify individual level knowledge to organisational and inter-organisational levels is unparalleled; And that e-mail has the capability of playing a significant role in three of the four modes of knowledge conversion discussed by Nonaka and Takeuchi (1995): externalisation, combination and internalisation. E-mail facilitates externalisation (tacit to explicit) through dissemination of individual knowledge to others in the organisation. It has an important role in combination (explicit to explicit). Here it facilitates the distribution of explicit knowledge, by increasing the number of people capable of generating it. Moreover, internalisation (explicit to tacit) represents the cogitation of the other conversion modes when it results in expanding individual understanding, or acquisition of tacit knowledge. According to Nonaka and Takeuchi (1995), for explicit knowledge to become tacit, it helps if the knowledge is verbalised or diagrammed into documents, manuals, or oral stories. Documentation helps individuals internalise what they experienced, thus enriching their tacit knowledge (Bontis et.al, 2002).

Further to Bontis's research, Sharma Lichtenstein argues that newly created knowledge is increasingly viewed as the most valuable source for a competitive advantage for business. The study highlights the potential for email as a key component in a company's formal knowledge management strategy. Lichtenstein (2004) found that in selected email conversations, employees naturally and intuitively build, purpose-driven new knowledge, incrementally and iteratively, crystallising knowledge-under-construction by submitting it repeatedly to a range of stakeholders for comment, until a 'consensus' is reached regarding the outcome. Furthermore, and in contrast with media richness theories, there is an acknowledgement that e-mail has many powerful and unique properties for managing communication about work objects that are much more than just a poor simulation for face-

to-face communication (Ducheneaut and Bellotti, 2003). Moreover, it has been reported by the CIO that three quarters of a company's best insights are contained in its email messages (CIO.com, 2001).

To ensure that e-mail remains a valuable business tool, software vendors try to find ways to utilise the so called knowledge residing in e-mail messages. Such applications analyse each email message creating a profile database that is accessible to everyone in the organisation. Thus rendering the e-mail server, not only a tremendous source of explicit knowledge, but also a facilitator of new tacit knowledge creation by bridging current skills and expertise in the organisation to those who need it (Bontis et al, 2002). However, the successes of such systems have not been high due to the poor profiles produced and or that the messages sent do not contain expert information.

In the light of the current research the authors of this paper determine if employees share knowledge within email messages and if the knowledge can be extracted to enable key personnel to be located within the organisation. The research looks at the individuals' attitudes and usage of varying communication channels, specifically concerning the extent to which they share knowledge via email. The two key questions the authors address are:

- + To what extent do employees use email to help generate, organise, share or leverage knowledge in comparison with other communication mediums?
- + Is it possible to profile employee's knowledge from the emails they send?

## **METHOD**

To determine if employees share knowledge within email messages and if the knowledge can be extracted to enable key personnel to be located within the organisation a questionnaire was constructed. The questionnaire consisted of 12 questions divided into four sections, in which respondents were asked about their personal use of various media and about their views regarding an Email Knowledge Extraction (EKE) application, which tries to uncover 'who knows what' in an organisation through using e-mail content as evidence of expertise.

A brief introduction along with instructions on how to fill out the questionnaire was included at the top of the questionnaire. Within the first section of the questionnaire three main areas were covered. The first asked questions about the frequency of email use in relation to other mediums and as a knowledge sharing versus knowledge seeking instrument. The second asked the respondents views regarding various aspects of EKE. The final questions ask the participant to examine their sent email content in terms of whether it could be used as a profile to denote their knowledge.

Once the questionnaire has been constructed a pilot study was undertaken with thirteen participants at AstraZeneca UK, a major international healthcare organisation. The aim of the pilot was to verify and validate the questionnaire. Questions that were described as ambiguous or unclear were reworded or removed. Based on the participants' feedback and general comments about the questionnaire, a final questionnaire was prepared.

## Questionnaire Structure

The final version of the questionnaire was administered to academics from the Research School of Informatics and the Civil and Building Engineering Department at Loughborough University and to employees at an IT firm in the United States. The total number of responses was 13 from academia and 9 from industry.

The questionnaire asked the respondents to specify their frequency of usage of different types of mediums to help generate, organise, share, or leverage knowledge within the organisation from the following list of choices: daily, weekly, monthly, 6 monthly, yearly, never. Respondents were asked to indicate what they mostly use email for. The choices were: to ask questions, to answer questions, both equally. This was intended to uncover whether the respondents tend to share knowledge, seek knowledge or use it to both share and seek knowledge. This also enabled the authors to determine the correlation between the respondents' position in the organisational hierarchy and the way they use email.

Respondents were asked about their views on EKE and if they thought that their company would benefit from using EKE (strongly agree, agree, neutral, disagree, strongly disagree). To determine the percentage of respondents who might use the system, respondents were asked whether they are willing to make their areas of expertise known to the wider organisation to help other employees find information. Moreover, it was essential for the authors to determine what communication mediums the respondents preferred when being contacted by others for help, thus, respondents were asked to rank (1-most to least-6) various communication mediums in order of preference when being contacted by co-workers for help. Finally regarding the respondents views on EKE, respondents were asked to report the number of enquiries they were willing to reply to in a week. The respondents could choose from 0, 1 – 3, 4 – 7, 8 – 10, more than 10 enquires.

The primary question the authors seek to address in this research was, is it possible to profile someone's knowledge using the content of emails to enable key personnel to be located within the organisation. Respondents were asked to select 20 emails from their outbox in which they think they helped generate, organise, share, or leverage knowledge within the organisation. Respondents had to determine if the selected emails contain keyphrases that describe their areas of interest or knowledge. And if they do, are these keyphrases general or specific to their interest or knowledge. An example and a definition were provided to the respondents to help them distinguish between keyphrases that are general to their knowledge and a keyphrase that is specific to their knowledge. The definitions:

*General Keyphrase:* A keyphrase is general when it is applicable to, or affecting the whole or the majority of employees in the organisation (e.g: Aeroplane, Helicopter).

*Specific Keyphrase:* A keyphrase is specific when it is concerned specifically with the subject specified (e.g: Airbus320, Bell 206 JetRanger).

They then had to indicate their skill level in these areas - basic knowledge, working knowledge, expert knowledge using the following definitions:

*Basic Knowledge* means having a passing familiarity of basic issues, practices, developments, etc., and a general understanding and appreciation of their broad implications.

*Working Knowledge* means having a good knowledge of related concepts, theories, principles, standards, frameworks, procedures, etcetera.

*Expert Knowledge* means having a thorough understanding as to why and how things operate.

## RESULTS

### EMAIL USE

It was important to understand how employees use different medium to generate, organise, share, or leverage knowledge within the organisation, because it gives an indication on whether email is actually used for those purposes. To address this question, responses to the questionnaire instrument of frequency of use of different mediums were examined. Table 1 shows the respondents' frequency of use of different mediums from both the academic (ACD) and industrial (IND) sector.

Table 1: Frequency of use of various mediums

<i>Use of various mediums</i>		Daily	Weekly	Monthly	6Monthly	Yearly	Never
Face to face	ACD	85%	15%	0%	0%	0%	0%
	IND	78%	22%	0%	0%	0%	0%
Telephone	ACD	77%	23%	0%	0%	0%	0%
	IND	67%	33%	0%	0%	0%	0%
Email	ACD	100%	0%	0%	0%	0%	0%
	IND	100%	0%	0%	0%	0%	0%
Online (e.g.MSN)	ACD	8%	8%	15%	8%	15%	46%
	IND	67%	0%	0%	0%	0%	33%
Memos	ACD	0%	8%	23%	39%	15%	15%
	IND	34%	22%	11%	0%	0%	33%
Intranet	ACD	0%	39%	8%	15%	0%	38%
	IND	22%	0%	45%	11%	11%	11%

As shown in Table 1, the percentage of respondents specifying that they use email for knowledge purposes is 100% in both sectors. It is the mostly used medium that all respondents specified to use on a daily basis. Respondents were also asked to specify what they mostly use email for.

Table 2 summarises the responses. Results show that the majority believe that they use the email both equally to ask and to answer questions. These findings initially indicate that employees both share and capture knowledge via their email systems. No significant correlation was found between the respondents' position in the organisational hierarchy and the way they use email.

Table 2: Email Use

<i>Email used more to</i>		
To ask questions	ACD	0%
	IND	0%
To answer questions	ACD	31%
	IND	0%
Both equally	ACD	69%
	IND	100%

### RESPONDENTS VIEWS ON EKE

In the academic sector, the majority at 47%, believed that a system like EKE would benefit their organisation. However, results from the industrial sector show that the majority, 56%, were neutral towards the benefits of EKE. Their comments were that they need to see the system in use before they can judge if it is beneficial or not (See Table 3).

Table 3: EKE

<i>EKE is beneficial</i>			<i>Willing to make interest, knowledge and expert areas public</i>		
Positive	ACD	47%	Positive	ACD	54%
	IND	33%		IND	33%
Neutral	ACD	38%	Neutral	ACD	38%
	IND	56%		IND	56%
Negative	ACD	15%	Negative	ACD	8%
	IND	11%		IND	11%

The promising response received from both sectors was that if their organisation was using EKE, all employees are willing to reply to enquires from thier colleagues. Table 4 summarises the results, which show the number of enquires respondents are willing to reply to per week. These enquires that could possibly be generated by EKE are not part of an employees normal workload. They are additional enquiries that employees are willing to reply to. The result could indicate that employees realise the importance of sharing knowledge to improve their working day by helping their work colleagues.

Table 4: Enquiries per week

<i>Enquiries willing to reply to (per week)</i>		
None	ACD	0%
	IND	0%
1-3 enquiries	ACD	15%
	IND	11%
4-7 enquiries	ACD	23%
	IND	11%
8-10 enquiries	ACD	23%
	IND	11%
> 10 enquiries	ACD	39%
	IND	67%

Table 5 shows the mediums the respondents prefer to be contacted through by their colleagues. Results show that in the academic sector, people prefer to use the face-to-face approach. In the industrial sector, results were more scattered and results show that people like being contacted through face-to-face, email, or online.

Table 5: Preferable way of being contacted

<i>Preferable way of being contacted</i>		
Face to face	ACD	84%
	IND	34%
Email	ACD	8%
	IND	33%
Online (e.g.MSN)	ACD	8%
	IND	22%
Memo	ACD	0%
	IND	11%

#### **USING EMAIL CONTENT TO PROFILE EMPLOYEE EXPERTISE**

Is it possible to profile employees' knowledge from the emails they send? To answer this question, each respondent had to analyse 20 emails from their outbox. As shown in Table 6, 59% of the respondents emails in the academic sector and 73% of respondents email in the industrial sector did contain keyphrases that could be used to profile their expertise. Respondents were then asked to specify whether these keyphrases are general or specific to their interest or knowledge. The results in the academic sector showed that 35% of the emails contained general keyphrases and 65% contained specific keyphrases. Respondents then had to indicate their skill levels in these areas. Results show that in both sectors, considering the emails general to the respondents' interest or knowledge, there is no significant variation in the level of skill. Whereas, considering emails specific to the

respondents' interest or knowledge, there is a considerable difference. In the academic sector for instance, the significant proportion of skill level is expert knowledge.

Table 6: Keyphrases

ACD						IND					
59% have keyphrases						73% have keyphrases					
35% General			65% Specific			41% General			59% Specific		
BK	GK	EK	BK	GK	EK	BK	GK	EK	BK	GK	EK
28%	34%	38%	8%	14%	78%	25%	42%	33%	9%	57%	34%

## DISCUSSION AND CONCLUSIONS

The questionnaire was sent out to both academia and industry to gather a through view of whether there was an existing practice of knowledge sharing via email within each organisation and whether this knowledge can be used to profile employee's knowledge. The authors acknowledge that due to time constraints the sample size was smaller than anticipated. In both sectors, results show that email is the most frequently used communication medium. Respondents reported to use email on a daily basis to help generate, organise, share or leverage knowledge. In academia, the other mediums used by employees on a daily basis ordered by their frequency of use are face to face, telephone, and online (e.g. msn). However, in industry all mediums were reported to be used on a daily basis and the order of their frequency is face to face, telephone, online (e.g. msn), memos, and discussion groups.

As demonstrated in Table 5 most employees in academia favour being contacted via face-to-face rather than email. This is most probably because it is easier to explain something face-to-face or/and they don't want what they have written to be a record that could be used against them. Interestingly, in industry results showed that respondents had no favourable preference of being contacted.

The results revealed that it is possible to profile employees' knowledge from the emails they send. Using the categories of knowledge in the questionnaire (general versus specific), employees indicated whether the keyphrases found in the email text were either general or specific to their interest or knowledge fields. This indicates that not only it is possible to identify employees with a general knowledge about various areas, but also employees with knowledge in specialised areas. For instance, most people engaged in building construction have a general knowledge of the construction processes, but only a few are specialised in the environmental impact of construction processes.

While the research does not attempt to suggest that expertise profiling is *best* supported by email, it was found that in email where knowledge development and creation occur, it is possible to profile someone's knowledge based on the emails they send. Having answered that question, the authors will be able to move to the next stage, which is how to extract expert keyphrases from emails.



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