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Knowledge Development and Creation in Email

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Abstract

Newly created knowledge is increasingly viewed as a highly valuable source of competitive advantage for business. Email is explored in its recently-recognized role as a place of organizational knowledge development and creation, employing discourse analysis of email conversations as the research approach. This paper describes a knowledge development lifecycle derived from the empirical study, and provides insight into the nature of knowledge development and creation in organizations. We found that in selected email conversations, employees naturally and intuitively build purpose-driven new knowledge incrementally and iteratively, crystallizing knowledge-under-construction by submitting it repeatedly to a range of key stakeholders for comment, until a 'consensus' is reached regarding the outcome. Our findings identify the process of knowledge qualification in organizational knowledge creation, and suggest that organizational knowledge may be politically-constructed. The research results have the potential to assist organizations in understanding and facilitating processes and conditions for knowledge creation and development. The study also highlights the potential for email as a key component in a company’s formal KM strategy.

1. Introduction

In an increasingly globalized world, knowledge management (KM) has emerged as a business imperative for sustained, successful competition [1]. Without genuine depth and breadth of organizational knowledge, employees perform knowledge-intensive work inefficiently and ineffectively, and are hampered in innovation development. Strategies for a second key business differentiator, organizational learning, also rely on widespread employee access to knowledge [2]. In pursuit of the potential process, productivity and strategic benefits available, KM attempts to harness and leverage organizational knowledge through the creation, transfer and application of knowledge [3]. Taking up this challenge in recent years, many companies have deployed calculated, systematic KM – with mixed results spanning acclaimed performance to complete abandonment [4].

Current KM approaches have recognized the criticality of human and social factors for sustained effectiveness, replacing an earlier focus on technologies [5,6]. Not surprisingly, cultural adoption, employee buy-in, empowerment, alignment and motivation are now perceived as the most important factors in KM success [7]. Popular solutions have included attempts to motivate diffident employees in knowledge sharing, and efforts to operationalize the capture and conversion of elusive, strategic tacit knowledge into explicit knowledge, for storage and reuse [8].

Little attention, however, has been given to understanding how new organizational knowledge can be created with planned KM strategies. Scholars increasingly believe that knowledge creation – ‘the discovery and development of new knowledge’ [9] – represents the most significant source of business competitive advantage, both now and in the future, leading as it often does to innovation [6,10,11]. Napoleon Hill suggested that human imagination combines existing knowledge with ideas, creating ‘organized plans’ – in other words, new knowledge [12]. However, current, crafted KM endeavors may not provide conditions favorable to the stimulation of employee creativity – conditions such as the absence of preconceptions about potential creativity sources, enabling of employee autonomy and initiative, and facilitation of serendipity presenting as accident tempered by sagacity [13,14,15]. Four modes of knowledge creation were identified in Nonaka’s [16] seminal knowledge development lifecycle: socialization; externalization; internalization and
combination, since which time various authors have modified and extended this cycle [for example, 3,9,17], although no accepted common understanding has emerged, as yet.

Alavi and Leidner [3] posed the following question as a key KM research issue: “What conditions facilitate knowledge creation in organizations?” For this purpose, they suggested researchers study environments which facilitate knowledge creation, such as ‘ba’ [18] – knowledge creation spaces which employ tools such as data mining; dedicated information systems; email; group support systems; intranets; and various forms of computer-mediated communication. From understanding the underlying processes and conditions for knowledge creation, management interventions can be designed which facilitate them.

Addressing one of Alavi and Leidner’s [3] nominated knowledge creation spaces, our research focuses on one commonplace, everyday organizational environment in which, we suggest, employee ideas are regularly combined with existing knowledge to create new knowledge – email. In support of our choice, recently Ducheneaut and Belloti [19] observed the phenomenon of selected, protracted email conversations transforming themselves into new knowledge artefacts, and suggested that “email users draw on the persistence of the medium to make sense of the objects being talked about, and sometimes even transform the conversation itself into an object of conversation”, illustrating this concept with the evolution of a conversation into organizational policy.

Although well-established as an essential communication and collaboration channel in most organizations, email now also comprises a key element in a company’s KM armoire, and was found in 1997 to be the second most common organizational KM tool after intranets [19,20,21]. Bontis et al. highlighted the significance of knowledge flows in organizational and inter-organizational email, arguing for a more formal role for email in KM strategy [22]. Interestingly, Kock’s comparison of knowledge transfer in email and face-to-face conversation discovered higher quality contributions within email [23], while CIO.com reported that three quarters of a company’s best insight is embedded in its email [24]. Finally, email usage has proven far greater than previously predicted by media richness, social influence, channel expansion or other published theories. We argue that a likely contributor to email’s largely-unexplained popularity and persistence is the significant knowledge work enabled through its medium – including knowledge development and creation.

We felt that an investigation of knowledge development in email may shed light on the processes involved in organizational knowledge creation, as well as suggest conditions which would favor such creation. This paper aims to provide an understanding of how knowledge is developed and created in organizations, as disclosed by discourse analysis of email conversations. The paper is structured as follows. Section 2 explains the research design for the study. Section 3 reviews key concepts suggesting email as a valuable organizational KM tool. In Section 4, a knowledge development lifecycle is presented, founded on the empirical study. In Section 5, implications arising from the research are discussed. Finally, in Section 6, conclusions are drawn, including a set of key factors for knowledge creation as found in email.

2. Methodology

We conducted an exploratory case study of the popular email client Eudora, as an exemplar of knowledge work incorporating significant knowledge development. We collected and analyzed three hundred complete email conversations featuring knowledge development and creation, obtained from the email archive of an academic at a large Australian university. Sampling involved selecting only conversations with more than ten messages, and featuring knowledge development with the creation of new organizational knowledge.

Conversations were analyzed using qualitative discourse analysis. According to Fairclough, a fragment of discourse can be viewed as “simultaneously a piece of text, an instance of discursive practice, and an instance of social practice” [25, p.3]. The textual dimension can be analyzed via qualitative content analysis, thereby identifying recurring patterns and themes; the discursive practice dimension can be explored by examining how texts are produced and understood; the social practices dimension examines how social issues, such as the organizational circumstances of the conversation, affect the discursive practice. A fourth dimension accounts for the wider context of a particular discourse [26]. We analyzed our data according to all four dimensions, and also employed Deetz’ dis sensus mode of dialogic (of critical) analysis [27] to uncover any unintended potentially harmful effects of knowledge work.

An email archive owned by one of the researchers was investigated, in order to improve understanding of context and establish a meaningful frame of reference [25]. In this way, the study benefited from participatory observation, enhancing our ability to interpret conversations and allowing immersion in the
context, work and work-life of the speakers [26] – although introducing an element of bias.

The unit of analysis was a complete email conversation. Coded categories were inductively developed, evolving to conclusive states over iterative readings. We thus arrived at themes, patterns and trends.

Due to space limitations, the results are illustrated using one only of the three hundred conversations. In the next section, we justify our choice of email as an exemplar case for this project by reviewing some of the key advantages of email for knowledge work.

3. Advantages of email for KM

"Email, far from being a poor, technically-limited substitute for face-to-face communication, has some unique and compelling properties that make it ideally suited for talking about things." [19]

As mentioned earlier, the presence and value of knowledge work in email has been increasingly observed by experts, as we now discuss.

3.1 Integration with everyday work practices

Email is a tool which naturally and intuitively integrates KM with normal work practices and business processes, eliminating the personal costs of separate attention to knowledge work. Ducheneaut and Bellotti [19] highlighted that "email has … become a powerful way to organize one's work and rapidly access work objects", performing the following organizational tasks involving significant knowledge work [19,28,29,30].

Email is utilized for activity recording, organizing, meeting scheduling, file transfer, referencing of digital work objects, assigning responsibilities and decision-making – with time and task management on the horizon. Quoting previous related messages by appending them to new posts is a popular feature, in order to facilitate understanding through disclosed histories of conversations. Email record-keeping as evidence for accountability and legality is increasingly important. Knowledge development and creation occur within many conversations, as we describe in Section 4. Finally, email provides a complete personal knowledge archive, including personal knowledge trails.

3.2 Sense-making through contextualization and personalization

Sense-making is considered essential to the development of situated knowledge, believed to be of high strategic value to an organization [31]. Indeed, Snowden's Cynefin model is centered on sense-making, linking different types of knowledge communities through shared histories [32].

Collison and Parcell suggest that knowledge workers need to "know what, who, where, when and why" about knowledge, to enable sense-making [33]. Such context is well provided for by email, through the natural processes of discourse, referencing of work objects (for example, digital documents) and the historicity provided by appended, quoted emails in a conversation. Participants can provide important context about organization or group culture, norms, beliefs, strategy, objectives, political and power structures, authority, relevance, pressures and degree of urgency. Furthermore, if the context provided by a message is insufficient for complete, situated understanding, the recipient can immediately request the missing context by return email.

There is more to sense-making than simply providing context, however. Tsui [34] and others have suggested the need for personal, rather than enterprise, KM tools. An exclusive email message is likely to be expressed in terms which the recipient can readily understand, or clarify (via email exchange). Moreover, an exclusive message appeals to the self-centric interests of the recipient, assigning the message added meaning for its recipient.

3.3 Accessibility and accountability for knowledge workers

In order to secure key employee contributions in the development, sharing and creation of knowledge – thereby improving the likelihood of a successful outcome – relevant people must be available and accessible, and must be sufficiently motivated to cooperate and collaborate. In dedicated KM projects, experts must be specially summoned to assist in knowledge work, and may not feel motivated to participate. However, email is a tool which ensures that key stakeholders in the knowledge processes and outcomes are accessible and accountable in participation. First, email is able to access people in many different places and time zones, at each individual's convenience. Second, judicious use of the cc (copy) facility can ensure employees are 'on view' to key figures during message exchanges, increasing individual levels of accountability.

With email, the expectation is that employees are responsible for appropriately handling all incoming email. If an email is addressed to an employee asking for her assistance, for example, the employee is obliged to read it – and respond, where appropriate.
Moreover, regardless of whether a response is actually given, the employee in receipt of that message is clearly accountable for her decision, as well as for the quality of any response given.

Elsewhere, we describe in greater depth the advantages of email for knowledge work [35], turning now to the results of our empirical investigation. In the next section, we describe a model of the knowledge development lifecycle, based on the results of our study of email conversations featuring knowledge development and creation. In the descriptions and discussions, we reference relevant literature only in order to highlight scholarly support for the model elements.

4. Knowledge development lifecycle

We identified a pattern of knowledge development and creation in the conversations studied, as conceptualized by the knowledge development lifecycle shown in Figure 1. Five underlying processes were identified: initiation, crystallization, sharing, qualification and combination, resulting in the creation of new knowledge.

This lifecycle is illustrated by the email conversation, below:

Ray (initiation): “I am planning to teach Subject A next year on week nights, instead of weekends. In order to do that, I need a free week night when there are no other classes for students. Bob, can you swap times with me for Subject B, and teach on weekends?”

Bob (crystallization, sharing, combination): “I wish I could help, Ray, but I can’t do weekends, either. I’ve been thinking though of changing the teaching for Subject B. I’ve noticed students don’t get much out of Tutorials in Subject B, so I might omit those and have a two hour seminar which I can put on at 4pm. You can then teach three hours of Subject A afterward at 6pm, Ray. What do you all think?”

Julie (crystallization, sharing, qualification): “As I recall, Marcia says all postgraduate subjects need three hours of class contact.”

Marcia (crystallization, sharing, qualification): “Colleagues, yes, the students like three hours of class contact a week, to provide the understanding they need in the subject.”

Ray (crystallization, sharing): “Maybe it is time to look at alternative ways that provide even better value?”

Marcia (crystallization, sharing, qualification): “Well, perhaps Bob can find an innovative way of doing that? Bob, I will leave it to you to come up with something.”

Bob (crystallization, sharing, combination): “After some discussions with others about this, I suggest we have a two hour workshop each week at 4pm, and a two day workshop during the mid-semester break.”

Marcia (crystallization, sharing, qualification): “Sounds good to me. What do you think, Julie and Ray?”

Julie (crystallization, sharing, qualification): “Good idea!”

Ray (crystallization, sharing, qualification): “Yup. Thanks, Bob.”

The five processes involved, and the outcome of the lifecycle, are described below.

4.1 Initiation

The email fragments in our study exhibited a variety of types of knowledge development initiation, *inter alia*: claim, assertion, challenge, instruction, link to stored knowledge reference, plan, accusation, question,
responsibility assignment, statement of intent, and statement of emotion. Email-based knowledge micro-communities form around an initial message – termed the knowledge seed – comprising information or knowledge inspired by an individual, group or organizational need. The originating message then becomes part of a knowledge trail consisting of successive, related emails within one or more associated threads, all stemming from the first knowledge seed email.

It is important to identify the initial message as either information or knowledge. According to recognized definitions, information possesses meaning, but lacks the value assigned by contextualization and interpretation. Davenport and Prusak define knowledge as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information” [1]. By these definitions, the knowledge seeds comprise mainly information, rather than knowledge.

4.2 Crystallization and sharing

The initial email and its recipients form the first circle knowledge micro-community, a circle which later expands or shrinks according to the needs of participants. Each successive micro-community with whom the next email in that thread is shared, is either informed with the complete knowledge trail by virtue of having been in the circle from the beginning, or receives only those segments passed on to it by earlier circles. However, along the knowledge trail, the knowledge-under-construction grows and is crystallized by the micro-communities involved, as well as by reference to authorities, documents and other knowledge sources. Insights, ideas, suggestions, contextual information and other existing knowledge are shared along the way by participants. Participants contribute (share) knowledge, which is combined with knowledge-under-construction – knowledge combination. Selected participants qualify the knowledge-under-construction – knowledge qualification.

As knowledge-under-construction progresses along the knowledge trail it is transformed, increasing in significance accordingly. The evolving knowledge typically gains direction, scope, multiple perspectives, feasibility, context, relevance, understanding, clarity, substance, individual and micro-community support, validation, needs satisfaction, problem resolution, consensus, authorization, innovativeness and decisions.

Eventually, the knowledge trail concludes when, for example, the needs of the various micro-communities are satisfied, or they simply change priorities, or there is another reason for termination. Aspects of the knowledge trail are now “known and understood” according to individual sense-making, by at least some of the people in the micro-communities involved. At that point, some people who had access to and followed and understood the entire trail, are in possession of all the knowledge represented by that trail. Therefore, knowledge sharing has taken place during and as a by-product of the development of the knowledge itself. By the conclusion of the conversations selected for our study – selected because they featured knowledge development and creation – new organizational knowledge had been created.

4.3 Qualification

Knowledge qualification is a key process occurring within the crystallization process. We observed incremental knowledge qualification as knowledge progressed from its initiation as knowledge seed through to its final outcome. McElroy [36] discussed the need to validate new knowledge claims according to organizational criteria, to determine their value and veracity. He suggested KM practitioners establish validation criteria by which new knowledge would be evaluated. Steering away from such a rigorous, explicit validation process, Schreyoegge [37] pointed out that in an era of knowledge overload, a person’s need to select and, we suggest create only worthwhile (that is, qualified) knowledge, becomes important. Schreyoegge poses a question, “Which of the available knowledges are right, reliable and checked, so that an efficient use is possible and makes sense for me?” To this end, Schreyoegge supports the need for a knowledge qualification phase in all KM ventures.

We discovered in our conversations several such qualification processes typically occurring, with key stakeholders repeatedly assessing knowledge-under-construction, involving reflection and evaluation according to often-unspecified, situated criteria, until the forming knowledge was acceptable to (that is, qualified by) all parties. Key stakeholders involved in such qualification fulfilled different roles, inter alia: policymakers, involved peers, authorities and decision-makers (for example, managers).

4.4 Combination

Knowledge is contributed by participants throughout a conversation, being added to knowledge-under-construction with procedures of refinement, exclusion, sorting, categorization or other combination.
4.5 Outcome

The email conversations studied resulted in new organizational knowledge presenting in various forms including organized plans, policies and decisions.

5. Discussion

Our research yielded some interesting results, as we discuss in this section.

5.1 Political construction of knowledge

Schultze and Leidner [38] identified a paucity of existing dissensus approaches to research in KM, and pointed out the dangers of consensus modes not uncovering any unintended, negative consequences of KM. Deetz' [27] framework of four discourses in organizational science includes the dissensus mode of dialogic discourse – a postmodernist approach which examines the constructed nature of reality, the fragmented multi-vocal nature of the unbounded construction process, and hidden enclaves of resistance. We felt it may prove useful to examine the research results from the dialogic perspective, in order to take advantage of insights suggested by our prior knowledge of the roles of the knowledge work participants. The findings from this analysis follow.

On the one hand, the qualification of knowledge-under-construction, which was observed in every conversation, suggested the notion of consensual instantial knowledge, in which the only valid knowledge is that which has been mutually agreed by the parties with the rights (either formal or informal) to approve the knowledge as situationally (i.e. temporally, group-wise and spatially) valid. On the other hand, at a deeper level our results questioned Boshier's argument: “E-mail appears to provide a context for the kind of non-coercive and anti-hierarchical dialogue that Habermas claimed constitutes an 'ideal speech situation', free of internal or external coercion, and characterized by equality of opportunity and reciprocity in roles assumed by participants.” [39]

In fact, our dialogic analysis suggested that participants qualified knowledge-under-construction in line with their organizational roles and positions, showing deference to the 'truths' of authority figures – both real (institutionalized) and perceived. This bears resemblance to Foucauldian thinking, in which the claim to truth is an act of power [40].

We suggest, therefore, the political construction of organizational knowledge, with created knowledge being fashioned according to the prevailing power structures – either formal or informal – in different knowledge work groups. In our illustrated example earlier, Marcia is the key power figure whose views superimpose on the knowledge being developed. It is her intervention which shapes the knowledge created.

5.2 Instantial, situated knowledge

Returning to consider the instantial, situated nature of selected organizational knowledge found in knowledge development in email, we suggest this has important implications. For example, such knowledge will not necessarily possess credibility or understanding outside the micro-communities which negotiated it, and will therefore need to be linked in some way to key authorities – who must be prepared to defend it from contest by others, and to explain it if called upon. This type of knowledge may also lose validity with time and other situational parameters, even with members of the community who formulated it, suggesting the dynamic, 'just in time' and 'one time use' perspective of KM [32], and knowledge development and creation on a 'need to know' basis. It would be interesting to investigate the role of such dynamic knowledge within an organization's knowledge repertoire.

We also observed that what a company may generally view as static knowledge (in our sample email conversation – the subject teaching method) is not necessarily taken as commonly agreed, but rather is consulted, queried, debated, and sometimes revised, when called into discussion – indicating that even such 'static' knowledge is merely a starting point for developing a situated form of the knowledge. It appears that 'static knowledge' has expiry conditions, and only by debating it can its currency be ascertained.

5.3 Collaborative purpose-driven team development and creation of knowledge

Our study highlighted some important advantages of purpose-driven, one-time-only, just-in-time knowledge development teams, in that there was a clear sense of enforced, natural collaborative effort involved in each knowledge-building conversation. 'Team members' who had been informally and virtually assembled (via direct addressing or copying) shared a common motive, derived from the clear linking of the knowledge development to their everyday work needs, activities, responsibilities and duties.
5.4 Knowledge work efficiencies and rewards

Knowledge development was economical in respect of the limited resources of all parties’ time and attention, as well as rewarding in various ways. People were included in the circulation of messages only when needed and as appropriate, including: peers, decision-makers, knowledge experts, administrators and knowledge archivists. This may have enabled key people with little time and attention to contribute in a timely and economical fashion. The participation of decision-makers also meant there was an extremely high likelihood that the created knowledge would have a practical, immediate outcome – thereby motivating participants to develop a good solution, quickly.

Also increasing chances for a successful result, and therefore a motivating factor, sufficient persons in key organizational roles were consulted during knowledge development such that the created knowledge could be easily defended by those same recognized personnel, if challenged. Added incentives for participant involvement were provided by the work-related intended uses of the knowledge being developed. Finally, the presence of peers and authorities in the virtual teams enabled worker contributions to be rewarded with positive feedback immediately – an act witnessed by other participants. Such public praise can be highly motivational.

5.5 Third generation knowledge work

In the 3rd generation of KM, suggests Snowden, companies need to manage knowledge as a flow, rather than a ‘thing’ [32]. In so doing, he continues, firms must focus on context and narrative rather than content. Snowden discusses three heuristics of the new thinking in KM, discussed below in the context of our own research findings in investigating email.

(a) “Knowledge can only be volunteered; it cannot be conscripted.”

It was clear from the study that employees voluntarily participated in knowledge development. In each case, there was a mutual purpose or common goal to the activity, and a clear sense of teamwork. Management intervention was absent, and apparently unnecessary for the stimulation of knowledge creation.

(b) “We can always know more than we can tell, and we will always tell more than we can write down.”

Our results partly question Snowden’s principle, in that the value of what is spoken aloud may be less than what is written, in certain situations. Email, as an asynchronous medium, allows time for individual reflection between postings. The conversations studied contained high levels of reflective knowledge which, according to Snowden, is of high value [32]. Cybulski et al. observed that often it is the quiet, reflective thinker who offers a creative solution [41]. We therefore question whether the same kind of reflection, often leading to a valuable creative solution, would be possible in face-to-face communication.

(c) “We only know what we know, when we need to know it.”

We found that knowledge creation in email was indeed triggered by circumstance. With a mutual need for new knowledge, participants were motivated to create it, as in our illustrated example earlier.

Thus, our findings are mostly in line with Snowden’s concept of 3rd generation KM, with the exception of the highly valuable reflective knowledge found in email, which suggests that principle (b) deserves revisiting.

5.6 Multi-vocal generation of knowledge and organizational learning

Senge’s positivist portrayal of organizational dialogue as a ‘coherent, consistent voice promoting organizational learning’ was disputed by Deetz’ view of dialogue as a means to hear and understand – but challenge and review – multiple viewpoints [27,42]. Oswick et al. conducted a study of dialogic scripting, advancing the Deetzian view by determining that discordant interaction in genuine dialogue generates individual understanding as well as collective learning, and concluding that dialogue is the primary means for achieving organizational learning [43]. We also identified challenging, multi-vocal dialogues in our own study, and found that these multiple, discordant voices (what Oswick et al. term ‘plurivocal’) of email discourse appear to act as stimuli for knowledge creation.

This finding may appear to contradict our earlier finding of the political construction of knowledge, which suggested the imposition of authority views, rather than a community debate moving toward a solution. However, we submit that both findings are compatible, in that the knowledge that has been created may well have been filtered by the politics of the organization (or more correctly, the politics of the micro-community engaged in the dialogue), while having captured the minds and hearts of the participants to the extent that the discourse is argued and pursued until ‘viable’ (useful to all, albeit politically qualified) new knowledge is eventually created.
6. Conclusion

We have described in this paper a knowledge development lifecycle (Figure 1) derived from an empirical study of email discourse, providing insight into the nature of knowledge development and creation in organizations. While our research does not attempt to suggest that knowledge creation is best supported by email, we nevertheless found that in email conversations where knowledge development and creation occur, employees naturally, spontaneously and intuitively build purpose-driven new knowledge, crystallizing knowledge-under-construction by submitting it iteratively to a range of key stakeholders for comment and new input, until a 'consensus' (which may be politically driven) is reached, regarding the outcome. Although the results are limited to a sample of three hundred email conversations in a single large organization – and of course one cannot generalize from this small sample of data – the study has yielded a number of significant insights.

The findings highlight the critical role of the previously-unidentified process of knowledge qualification in organizational knowledge creation. In this process, knowledge-under-construction is repeatedly 'ruminated' and evaluated for inaccuracies, incompleteness, inconsistency, unreliability, situational and organizational infeasibility, and weighed with respect to costs and benefits – by participants. Qualification is alternated with the process of combining new knowledge with knowledge-under-construction. Iterations of knowledge qualification and knowledge combination continue, until the knowledge being built is considered 'the solution', in a closing act of qualification.

In stepping back to consider the domain of study, we recognized that knowledge work in the email sample resembled the domain of complexity defined by Snowden in his discussion of complex adaptive systems knowledge flow – in that informal communities clustered naturally, and participants “recognize, disrupt, reinforce and seed the emergence of patterns. (and)… allow the interaction of identities to create coherence and meaning” [32]. This pattern was observed in many of the conversations studied. Snowden distinguishes complex domains from chaotic domains in which “no such patterns are possible unless we intervene to impose them; they will not emerge through the interaction of agents”.

Snowden suggests that complex domains are managed and led by the early identification of pattern formation, followed by disruption of any undesirable patterns, and stabilization of those desired. We observed signs of this type of management and leadership in the discourse interactions, although there was no evidence of any planned strategy in this respect. The leadership which emerged appeared to be based mainly on natural authority and respect of a patriarchal or matriarchal nature, and was exercised by way of knowledge qualification, suggesting the political construction of knowledge, as described earlier. However at times, a perceived authority figure was clearly linked to an organizational position, and again, we observed the key role of power gained through knowledge qualification.

The ramifications and exploration of the political construction of organizational knowledge is an interesting avenue to investigate, in future research. Questions about the value of such knowledge arise. It is possible that only such politically-qualified knowledge will fit the particular organization’s culture, needs and constraints, but of greater concern is that many good ideas may well be lost along the way.

Table 1 Key factors in organizational knowledge creation

| 1. Accessibility and accountability of key stakeholders (involved peers, decision-makers, domain experts) |
| 2. Knowledge development lifecycle – initiation, crystallization, sharing, qualification and combination |
| 3. Sense-making through communication, contextualization and personalization |
| 4. Reflective asynchronous knowledge work |
| 5. Purposive problem-solving |
| 6. Cooperative and collaborative team effort |
| 7. Multiple discordant 'voices' |
| 8. Access to rich information and work objects |
| 9. Just-in-time, situated knowledge development |

Finally, our research results suggest a set of key factors in organizational knowledge creation, as found within email (Table 1).

These factors may not be generalizable considering our small data sample, and may have limited application to other media and organizational environments. However, they provide a foundation upon which to build, in future research.

We conclude by suggesting that the informal knowledge work communities found in email are clearly valuable avenues for organizational knowledge development and creation. It would behoove businesses to recognize email, and other casual, fluid,
dynamic avenues for knowledge work, as important elements of their formal KM strategies.

Companies may also consider designing management interventions as suggested by our study (for example, enabling the factors in Table 1), in order to enhance knowledge creation in email and other organizational spaces.

Through constant organizational knowledge creation, innovation is enabled – and accelerating speed-to-innovation is the current “silver bullet” that companies now desire, in their relentless pursuit of the ever-elusive sustained competitive advantage. In the end, however, we suggest that the ultimate benefit of the knowledge development lifecycle presented in this paper lies in the learning which takes place during the processes of knowledge crystallization, sharing, qualification and combination – learning which generates individual and collective wisdom, claimable as real and durable competitive advantage.

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8. References


