

The Language Games of Online Forums

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Using Wittgenstein's language game paradigm, we analyze the discourse of three online forums devoted to a popular managerial topic. Four major dimensions shape our analysis: roles, legitimacy and authority, identity, and linguistic style. By examining recurrent speech patterns related to each of these dimensions we are able to describe the players, moves, and rules of each forum's language game. We find resemblance across the three forums in their informal and direct style of conversation. Each develops a rhythm of message posting and reply behavior that is established in the first few months and tends to persist. We characterize the differences among the three forums as *information kiosk*, *guild*, and *community*. These are distinctive games that vary in their enacted goals, complexity, and the range of roles and moves that players can take within the games. They imply different types of environments for information sharing. Our analysis reveals how similarities and differences in discourse development can explain commonalities and variants in the structure and functioning of fragile, online organizations.

Keywords: language game; discourse analysis; online forums; electronic communities; virtual organizations

THE LANGUAGE GAMES OF ONLINE FORUMS

Online discussion forums are increasingly regarded as important venues for promoting learning across the boundaries of time, space, and formal organization. Sometimes referred to as virtual communities or electronic discussion groups, online forums (OLFs) provide opportunity for people to exchange information via participation in group discourse around a common topic or theme. The forums are characterized by a discussion structure in which individuals post and respond to questions or commentary that is organized by subject, or thread. In-depth conversation and high diversity of participation are possible since contributors can be located anywhere in the world, pursue discussions for months, or even years, and need only to share an interest in a topical area and access to the Internet (Sproull and Farah, 1995; Jones, 1997; Blanchard and Horan, 1998; Butler, 2001).

OLFs provide a relatively new social setting in which professionals from many, varied organizations can come together to share information. A question of interest to organizational scholars is whether and how OLFs take on organizational properties (Ahuja and Carley, 1999). We know that people can create sustainable, shared language communities online (Wilkins, 1991), but relatively little is known about the structural elements or emergent rules of engagement within these collectives, or the different forms that online groups take over long time periods. Language is the main locus of OLFs, and so it follows that organizational understanding of these venues lies within their discourse (see Pennebaker, Mehl, and Niederhoffer, 2003). By identifying similarities and differences in the discourse of OLFs, we may uncover commonalities and variation in their organizational form.

In this paper we explore the organizational properties of OLFs using Wittgenstein's language game paradigm (1953, 1969). Wittgenstein argues that the constant alignment of speakers engaged in discussion results in patterns of language use. Routines of speech form as speakers define and re-define the rules of their engagement. These language routines, or games, are important for researchers to understand because patterned interactions are indicative of organizational structure (Orlikowski and Yates, 1994; Feldman, 2000; Feldman and Pentland, 2003) and form the basis for how information is shared and interpreted within a group (cf. Argote, 1999). Knowledge may be "owned" at the individual level, but it is integrated

at the group level via dialogue among parties (Brown and Duguid, 1991; Lave and Wenger, 1991; Nonaka, 1994; Edmondson, 1999; Okhuysen and Eisenhardt, 2002). OLFs provide venues for dialogue—and hence, learning—across professional, firm, and geographic boundaries. The objective of our study is to show how structure emerges in the tentative, fragile space of OLFs, creating varied opportunities for information sharing.

We direct our analysis to online forums with high potential for cross-organizational information sharing among managers or other professionals. These forums are not established to produce a product or service but merely to share information. We undertake an intense, qualitative examination of three OLFs devoted to the same theme: knowledge management (KM). As a relatively new area of practice on the management scene, KM would seem to be a ripe topic for information sharing. We select forums with the same topical theme in order to hold constant basic variations in subject matter and the kinds of participants who join the forums. At the same time, because we are interested in documenting variations in structure and functioning, we select a varied set of forums among the large set devoted to KM that can be found on the Internet. Our analysis reveals three distinct language games: *information kiosk*, *guild*, and *community*. These vary in their enacted goals, complexity, and the range of roles and moves that players can take within the games. They imply different types of environments for information sharing. Although the premise of our analysis is not new—that routines of language are indicative of organizational structure (Feldman, 2000; Feldman and Pentland, 2003)—our empirical advance is to show exactly how such structure emerges in the tentative, fragile space of OLFs.

Our paper proceeds as follows. First, we provide an overview of the language game paradigm and the major dimensions that frame our analysis. Second, we describe the research setting and how we collected and analyzed the data, including brief descriptive profiles of each OLF. Third, we present a summary case study of each OLF using four major dimensions as our guide. Fourth, we integrate these results to yield insight into the organizational similarities and differences among the three OLFs. We conclude with implications of our findings for developing OLFs as organizational venues for information sharing. We note our study's limitations and possible directions for further research.

LANGUAGE GAMES AND DIMENSIONS OF ANALYSIS

Language games are routines of discourse that constitute everyday life and give form, function, and meaning to human interaction. The games are “systems” (Wittgenstein, 1969: 81) that include not only words but also actors and actions: “I shall also call the whole, consisting of language and the actions with which it is interwoven, the ‘language game’” (Wittgenstein, 1953, I, sec 7). Wittgenstein argues that language is not universal or standard in its usages or meaning; rather, language is created and enacted by speakers as they generate discussion around ideas or objects of common interest. The language game paradigm contrasts with conduit models of communication (e.g., Shannon and Weaver, 1949), which emphasize channel capacity, medium, and the linkage between sender and receiver (Boland and Tenkasi, 1995). Instead, language games emphasize “forms of life” (Wittgenstein, 1969) that regulate thought and action. They are “spheres of activity...specialized forms of discourse” engaged in by a community (Astley and Zammuto, 1992: 444). As a simple example, Wittgenstein (1969: 81) describes the game of building. A builder shouts the words, “cube”, “column”, “slab”, or “beam,” and, in response, a helper passes the builder a stone selected in reply to the shout. Language games launch the possibilities and set the limit for information sharing and creation among participants in the game (Aldrich, 1999). They shape the structure and functioning of the social setting (Topp, 2000; Koppl and Langlois, 2001). Communication is fraught with noise and ambiguity, and notion of “game” suggests the inherent flexibility of language. Games evolve along with the social life of which they are a part. There are language games of colors, emotions, law, professions, work groups, countries, and business organizations (Aldridge, 1992; Astely and Zammuto, 1992; Barge, 1994; Smith, 1997; Myrsiades, 1998).

In new social venues, such as OLFs, language games may emerge that are different from the past. Contributors may import practices from existing games, but novel circumstances—e.g., multi-organizational participation, large numbers of contributors, recorded conversation, and the public nature of the discourse—will likely spawn new forms of language games. The notion of game highlights that there can be a multiplicity of games across settings, each with its unique rules: “And this multiplicity is

not something fixed, given once for all; but new types of language, new language-games, as we may say, come into existence, and others become obsolete and get forgotten” (Wittgenstein, 1953, 1, sec. 23).

Wittgenstein used the term *family resemblance* to refer to commonalities among games. Family resemblance corresponds to the global structure of a game, as shared in multiple forums, and contrasts with the local structure that is unique to one, or a subset, of forums. To the extent that we can understand the language games of OLFs their varied possibilities for information sharing will become evident.

Differences or similarities in language games lie in the kinds of *players* who participate; the *moves*, or actions that players take in the course of the game; and, most important, the *rules* that govern player actions and provide structure to the discourse. Overall, language games will vary in their *goals* (i.e., purpose) and *complexity* depending on the variety of these types of facets. For example, simpler games will exhibit fewer moves and rules, have more limited kinds of players, and be suitable where goals are not difficult to achieve. Complex games, by contrast, will include greater variety of players, moves, and/or rules, and may accommodate more difficult goals. These aspects of language games typically are not explicit. They may be discussed, or even codified, but the actual language game is the enacted process of dialogue. Goals, moves, and rules are established and maintained as players imitate and react to one another. We expect to find some resemblance among the language games of OLFs that discuss managerial topics, such as KM. At the same time, we expect differences to emerge across OLFs, since each is an independent system (of actors and actions) with its own dynamics. The logic is akin to Wittgenstein’s (1953) observation of both family resemblance and differences among the language games of color-- black, white, red, yellow, and so on.

In order to document the structure of language games, the researcher needs a conceptual model and methodology. Deconstruction of text, case analysis, ethnography, and systems analysis have all been used to document language games (e.g., Aldrich, 1992; Grover, 1993; Barge, 1994, Blair, 1995; Myrsiades, 1998; Van Every & Taylor, 1998; Topp, 2000). Here we take a case study approach, examining the discourse of each of three OLFs. Because our focus is on understanding how the online forums take on organizational structures for information sharing, we use dimensions derived from the literature of

communication, organizations, and learning to guide our analysis. Following Aldridge (1992), Ahuja and Carley (1999), and Galegher, Sproull and Kiesler (1998) we note demarcations of *roles* and expression of *legitimacy and authority* to identify role behaviors and major moves of players within each OLF. We examine expression of *identity* within the discourse to assess coherence among the players and the distinctiveness of the OLF game from other language games of which it may be a part, such as the local geographic culture or the larger professional KM community. Expressions of identity reflect rules for coordination and learning in organizations and online groups (Finholt and Sproull, 1990; Kogut and Zander, 1996). Finally, we follow Grover (1993) and others (Myrsiades, 1998; Topp, 2000) as we describe the *linguistic style* of the discourse. Linguistic style refers to the governance of speech inside the OLFs, defining what is acceptable or expected of players as they participate in the game.

Figure 1 summarizes our analytic approach. In the next section we define the dimensions and the questions that guide our case analyses. The dimensions provide a filter for identifying discourse that links to the structural elements of each game. They allow us to describe and interpret each OLF, yielding insight into the players, moves, and rules. We then characterize the overall properties of the games in terms of their goals, complexity, and implications for information sharing.

Figure 1 here

Roles

Games involve players who take on roles which, in turn, help to define interpersonal interactions and behaviors. Roles are the orchestrators of conversation and integral to the process of creating the basis for meaningful information (Kogut and Zander, 1996). Within OLFs roles occur as contributors enact specific types of communicative practices, respond to their use, or act to change them. For example, founders may influence the types of subjects contributors pursue. Forum moderators may influence the types of questions asked or how comments are presented, and facilitators may encourage discussions or

ask people to volunteer for some activities. A core group of contributors may take on most of the activity in the forum, but important roles also may be played by outsiders who, though not directly contributing to discussion nonetheless influence its direction; for example, contributors may refer to prominent experts (or gurus) in the topic being discussed. Roles may be disclosed directly, as a player claims his or her role (e.g., "I am the moderator") or designates it to another (e.g., "Sam is facilitating our discussion."). Equally important, roles are disclosed indirectly, in the way people behave and others react. Through their persistent use, roles encourage regularity in behavior (Pentland and Reuter, 1994) and thus become part of the rule set that constitutes the language game.

In our analysis we examine what types of roles emerge in the OLF and how they behave. Example roles types and questions that guide our analysis include the following:

- *Founder* – the person who starts the forum by posting the initial message. Who is the founder? Does the Founder state the forum's purpose or goal? What is his or her claimed role, if any? What actions does the founder take as the forum's life unfolds? (e.g., How active is the founder? How do other contributors to the forum react to the founder?)
- *Moderator* – the administrator of the forum who regulates the technology or its use by contributors. Does anyone claim to moderate the discussion or informally appear to do so? What actions does the moderator take, and how do others react to these moves?
- *Facilitator* – a person who directs discussion content. Does anyone encourage or discourage discussion topics or methods of posting messages, give constructive feedback or summarize the key learnings from a discussion? Is there only one facilitator, or several? How do contributors react to the facilitator(s)?
- *Guru* – Does the discussion include or refer to KM experts or other luminaries or prominent writers/spokespersons (Jackson, 2001)? How do they influence thought or action in the forum?
- *Core Group*- a set of contributors who return repeatedly over time; their communication ties are stronger (more frequent) than other contributors who operate on the periphery of the forum discussion (Smith, 1999). Is there a core group? How large is this group? How do they behave, and how do others react to their contributions?

Legitimacy and Authority

Legitimacy and authority refer to how contributors to the OLF present themselves to other players so as to be accepted and establish influence. Galegher et al. (1998: 499) discuss legitimacy and authority in online support groups at length. They observe that "to obtain direct support and information from others in the group one must demonstrate *legitimacy* - that his or her concerns are genuine and justified." Legitimate membership, or right to contribute, is signaled by reference to relevant experience; reference to shared

history, such as reading earlier contributions to the OLF; by statements that signal worthiness of participation in the topical discussion (e.g., “I have been practicing KM in my company for years.”); and by disclosing personal information that states who and/or why one is present in the OLF. First time contributors sometimes do this by referring to behaviors “I have been reading/lurking here for a few months,” or by stating a legitimate topic and noting its worthiness for discussion by the group. *Authority* occurs when contributors to the OLF “want readers to believe not only that they have a right to speak, but also that their answers should be believed” (Galegher et al., 1998: 500). Contributors may establish authority by referring to their successes, impressive accomplishments, or connections to prestigious people or institutions. Messages that trigger further discussion, as opposed to being ignored, can indicate legitimacy and authoritative influence.

In sum, legitimacy and authority in an OLF may be evidenced as follows:

- *Introductions* – How do new participants introduce themselves? What disclosure(s) do they provide about themselves or their background?
- *Reference to KM experience*: Do participants refer to relevant KM work or research experience, or membership in KM societies or other KM forums? (legitimacy) Do they refer to prestigious people or institutions? Do they refer to their successes or accomplishments? (authority)
- *Reference to OLF history*—Do participants refer to prior messages, to lurking, or state how long they have been involved in the forum? Do they may make reference to a specific line of discussion in the group?

Identity

OLF identity acts to reinforce social rules of “who we are” and “how we are expected to act” (Finholt and Sproull, 1990). Identity occurs as speakers define themselves in relation to the group. Identity can be found in surface language features that convey intimacy with others, such as reference to “we,” “us,” or “our group” (Weiner and Mehrabian, 1968; Ashforth and Mael, 1989) or reference to a common, larger community (“our KM professional community”). Identity also may be connected to locale, such as one’s workplace, homeland, or geographic region (see Kogut and Zander, 1996). We would expect common locale to aid identity in an otherwise distributed group such that professionals from the same geographic region would more readily identify with one another than with people distributed around the world. Foreman and Whetten (2002) refer to this as “identity congruence” and note its potential positive effect

on individuals' feelings of legitimacy and commitment to the organization. The reverse may also hold, in that commonality of culture and experience are more likely to promote social solidarity (Markovsky and Chaffe, 1995), identity synergy (Pratt and Foreman, 2000), and thus commonality within a group's language game. If contributors express common identity, especially identity associated with geographic locale, online interactions may spur face-to-face encounters (Kavanaugh, 1999; Millen and Patterson, 2002). In a similar vein, OLF contributors who share encounters outside of the forum boundaries, such as face-to-face meetings or attending the same conferences, may be more likely to overcome the drawbacks of distance and have greater opportunity to form a common identity (Cummings, Sproull, and Kiesler, 2002; Shapiro et al., 2002). In our analysis we refer to this phenomenon as *embodiment* of the language game— the link between the OLF and sharing of physical space.

In our case analyses we use the following indicators to document the extent to which identity exists within an OLF, and how it is developed and maintained:

- *Collective language* – Are participants using “we” or “us” to refer to OLF participants, rather than “you” or “I”? Do they use the OLF name, or refer to the group (“Hi, all!” “Dear friends,” “our group”)? To what kind of identity does the collective language refer:
 - *OLF identity* – reference to the immediate OLF or its contributors
 - *KM community* – reference to the larger professional collective who share the same interest
 - *Geographic identity* – reference to a common region, country, or other geographic locale that is shared by the forum contributors.
- *Embodiment* –Do participants refer to face-to-face meetings, conferences, the workplace, or other physical places where OLF contributors might interact offline?

Routines of identity-related speech reflect the coherence of the OLF and/or the larger communities of which it is a part. Shared identity is known to bring many advantages to a group process—lower attrition, reduced conflict, improved sense making, citizenship, commitment and control practices (cf. Foreman and Whetten, 2002; Pratt, 1998). Identity helps to create and preserve a “system of meaning” that binds people together (Albert, Ashforth, and Dutton; 2000). Kogut & Zander (1996) and Moreland and Levine (2002) note that identification with a group can act as an intrinsic motivator for individuals to contribute and not free ride. Hence, we would expect OLFs with higher group identity to be ones with greater contribution rates and higher retention despite lack of tangible incentives or rewards. This is consistent

with Wiesenfeld, Raghuram, and Garud (1999), who found high volumes of communication in a virtual work context to be indicative of strong organizational identification.

Linguistic Style

The distinct linguistic traditions of a group-- stylized vocabulary and communication routines--emerge across all or a meaningful subset of a group's messages. The linguistic style associated with an OLF may be characteristic of the messages themselves or of discussion-reply interactions (i.e., pairs of messages). There is not a fixed set of indicators or methods for identifying a group's style; rather, multiple approaches are possible. Wittgenstein (1953) cautioned against exclusive reliance on word counts or atomistic analysis of sentence structure. Instead, he emphasized the importance of describing the holistic nature of discourse and ongoing routines, or patterns, of speech. Because stylistic conventions can change over time as contexts change and as players enter and leave the game, longitudinal analysis is important.

To document linguistic style we examine a range of attributes that jointly indicate how contributors to the forum request, deliver, receive, and react to information, as well as the extent to which they manage interpersonal relationships during the process of information exchange. Most of these indicators require interpretive analysis and thus a full reading of the text produced by the OLF.

- *Greetings and signatures*: How do contributors address the other participants (e.g., "Hi, Meg" or "Dear Sir")? Do participants sign their messages or use signature files? What kind of signatures are they using? (e.g., none, "Joe" or "J. F.")
- *Message structure*: How long are the messages? What is the tone of speech? Are messages matter-of-fact, or do they include forms of politeness or expression of positive regard toward others? Do messages include reference to prior messages, forwarding, or excerpting of earlier message content?
- *Paralinguistic features*: How formal or informal are the messages? To what extent do contributors use punctuation, emoticons, capital letters, parentheses, etc.?
- *Feedback*—Do contributors express agreement or disagreement, or seek others' agreement or disagreement with a viewpoint or prior message? Do they express appreciation or acknowledgement (e.g., "Thank you," "cheers," "looking forward to...")?

Routines of greeting and farewell bracket the opening and closing of encounters. Greetings can signal the upcoming tone of the interaction, indicate co-presence and informality of interaction that can give rise to trust (Sarbaugh-Thompson and Feldman, 1998). Signatures, if present, punctuate the turn of speech and

may suggest the terms (e.g. direct or indirect, formal or informal) on which the speaker anticipates a reply.

Message structure and tone are indicated by a number of dimensions, including the degree of formality versus informality in speech; the choice of descriptive terms and references used by speakers; routines of replying (timing, content, tone, etc.), and message length (Goodwin and Heritage, 1990; Holmes, 1989; Galegher et al., 1998). In studies of communication in electronic groups, for example, researchers have noted that the style of messages tends to be informal and direct. To show thought linkages speakers may use elaboration and detailing of sentences, copying of prior messages, explicit reference to other parts of the text; or forwarding of messages from outside group as a way of importing new ideas (Ferrara, Brunner, and Whittemore, 1990).

In synchronous voice communication, paralinguistic speech devices—such as run on sentences, ellipses, parenthetical remarks, exclamatories, and first and second personal pronouns—are used to approximate a conversational style and a sense of informality. In online settings people have created new conventions unique to the electronic context, such as common abbreviations and emoticons (e.g., the smiley), contractions and informal spellings, and substitutions of symbols for letters; (see Ferrara et al., 1990; Marshall and Novak, 1995; Collet and Bellmore, 1996). Paralinguistic features suggest relationships between the speaker's attitudes and the ideas being presented, thus enhancing the meaning of phrases (Wilkins, 1991)

Seeking and providing feedback aid comprehension and can help to further the dialogue or deepen conversation. Feedback also aids relationship management, reinforcing social linkages in the group. As with other indicators, our interest is in whether, and how, feedback is part of the ongoing routine of speech in the forum. The linguistic style of the OLF, like expression of identity, is an important dimension of the rule set that shapes the group's organization and, hence, their information sharing process.

We now describe our research method and findings.

METHOD

Our analysis consisted of three phases. First, we selected three forums from the broad set of those available on the Internet and described each forum in terms of basic descriptive statistics and plots of contribution activity over time. Second, we developed case studies for each forum, attending to the four dimensions just described, generating detailed field notes. We summarized each case as a synopsis for each of three consecutive months in the forum's life, starting with the forum's founding (first posted message). Third, we developed detailed tables documenting the occurrence of discourse related to each of the four dimensions. The tables highlighted similarities and differences across the three forums. Using data from all these phases, we developed a generalized description of the language game of each forum, as well as their commonalities.

We emphasize that our goal was not to describe the language game of knowledge management (KM) per se but rather the game of sharing information about a managerial topic in the OLF setting. Our emphasis is processual, akin to Wittgenstein's (1969) analysis of the language game of builders (and not of the buildings) or Grover's (1993) analysis of the language game of project management (and not of software or other products of project management).

Data Collection, Sampling, and Analysis

A database of OLFs devoted to KM served as the source for our selection of OLFs for in-depth study. We selected KM as the topical domain because, as a relatively new area of practice, KM forums attract participation from multiple organizations and so are conducive to analysis of how virtual groups of professionals organize for information sharing online. The database was created by searching websites known to host a large number of OLFs, such as YahooGroups, eGroups, Deja.com, AOL, and msn.com, as well as searching more broadly to identify forums hosted by individuals, businesses and other organizations. We used search engines such as Google, Profusion, and Northern Light to scan for keywords related to the KM theme, such as "knowledge management," "km," and "k-m," and we reviewed websites devoted to these topics to find online forums. Forums were selected for inclusion in the

database if they met two criteria: the stated purpose of the forum was directly related to KM, and messages were archived online. In all, 40 forums were identified, and we downloaded the contents for the five-year period 1996-2001.

To select a small sample for language game analysis, we used hierarchical cluster analysis to group the forums based on three variables: the average number of contributors who returned each period to post messages (contributor retention), the extent to which contributors participated in other OLFs (overlap), and the number of contributors who repeatedly contributed to the discussion at above average levels throughout the life of the forum (high volume contributors). These variables are objective measures that have been suggested by researchers as important to profiling OLFs (e.g., Smith, 1999; Butler, 2001). Forum size, operationalized as the number of contributors each period, was controlled in the analysis by computing the variables as ratios, where the raw value of each variable was divided by the number of contributors in the forum. Table 1 shows descriptive statistics for these data. We followed the hierarchical cluster analysis method as described by Aldenderfer and Blashfield's (1984), Hair et al. (1998), and recommendations for applying cluster analysis in organizational research provided by Ketchen and Shook (1996). We standardized values for the variables to create common units of measurement; tested for outliers (resulting in no elimination of cases); selected the squared Euclidean distance as the similarity measure; and used Ward's algorithm in a hierarchical procedure to identify clusters. Three major clusters were identified, and we checked for the robustness of this solution through a random entry of cases into a second clustering procedure; the cluster orderings were different in the random solution but the results (cases composing each cluster) were otherwise identical. We selected three forums for language game analysis based on closest proximity to the mean values (centroid points) of each cluster.

Table 1 here

We limited our analysis to the first nine months of content in each OLF, starting with its founding. This approach provided sufficient data to document the development of the language game in a critical

period of the forum's life and yet was also manageable for an in-depth case study. In all, the dataset of the three forums included 811 messages.

We used inductive qualitative techniques to do the analysis (Glaser and Strauss, 1967; Miles and Huberman, 1984; Yin, 1989). Analysis consisted of multiple readings of the complete text of the 811 messages that composed the three forums. In order to facilitate a developmental analysis and the organization of the results, we divided the text of each case into three time blocks corresponding to the early (T1: founding through month 3), middle (T2: months 4-6), and later (T3: months 7-9) periods of each OLF's development. Two of the authors developed notes for each case which were then compared, clarified and further expounded to yield the final case study for each forum. We then summarized each case in a condensed synopsis. We looked for specific evidence of each of the indicators for the four major dimensions described in the prior section. In the second pass of the case, we marked the messages by sequential number and grouped those from similar dimensions together to identify patterns. To integrate the results of this longitudinal analysis, we used a cross sectional approach to develop the detailed tables for each OLF. Before presenting our case studies, we first provide some comparative descriptive information for each OLF. To protect the anonymity of the contributors, the forums are referred to here by the number they were assigned in our database rather than by their name or web address, and contributor names are substituted with fictitious names.

Profiles of the Three Forums

The forums were founded between July 1998 and August 2000. None required a fee to participate, and all were accessible via the web. One was a part of a larger portal site, whereas the others were strictly discussion groups with no other resources offered. Despite similar founding conditions, the forums varied considerably in their eventual number of contributors, message contribution per person, and other basic communication patterns. Tables 2 and 3 summarize key attributes of each forum. Table 4 displays their founding messages. Figures 2a – 2c display cumulative distributions of contributor behavior over time.

Tables 2 – 4 and Figures 2a-2c here

The forums are displayed from smallest to largest, in terms of total messages and total number of contributors. Note that a *message* is the basic unit of communication, and each message has one contributor associated with it. *Contributors* are the people who post the messages. Because retention in OLFs is low, the average number of messages per contributor tends to be low. For the three OLFs we studied, the ratio of messages to contributor is lowest in OLF 5 and highest in OLF 15; the values for these ratios are typical for OLFs (e.g., see Galegher et al. 1998; Smith 1999). *Discussions* are messages that start a new subject, or topical thread. *Replies* are messages posted in response to an existing thread. Note that OLF 25 generates more discussions than the other two forums; however, OLF 15 generates the largest number of replies.

All of the forums start out with just a few contributors during the first month, but growth in contributors is notably greater in OLFs 25 and 15 than in OLF 5. This is not to say that OLF 5 dies, however, since new discussions are started and there is a steady rate of about four messages per month starting in month four. Although the growth curves for message contribution are similar for OLFs 25 and 15, growth in discussions per contributor is greater in OLF 25 and growth in replies per contributor is greater in OLF 15. The discourse in OLF 25 appears to emphasize breadth (posting of new topical threads), whereas the discourse of OLF 15 emphasizes depth (replies to a single thread). Meanwhile, the discourse in OLF 5, though steady, remains very lean.

As a final step to provide a basic profile of each forum, we enlisted a research assistant to classify contributors according to their stated professional interest based on reading the first 20 messages in each forum, where introductory information tends to be more prominent (see Table 5). Contributors to OLF 5 were predominantly researchers and administrators, whereas contributors to OLF 25 were mostly managers and technical professionals and contributors to OLF 15 were primarily managers. In all forums, many contributors said nothing about their professional position; disclosure was highest in OLF 25, where 80% of contributors stated their professional position. We also noted whether the contributors appeared to be from a dominant geographic locale. OLF 5 has a founder from France and is mixed language, with

some messages in English and others in French. Contributors to OLFs 15 and 25 are dominantly located in India and Australia respectively, with all messages in English.

Table 5 here

Overall, the forums start out on relatively equal footing, yet they attract a slightly different mix of people and their discussions take on different growth patterns. These descriptive profiles beg the question of how the language games of the forums differ.

RESULTS

Case Synopses

We present here a summary of each case for each of the three-month time periods in each OLF's development. We provide summary tables of our findings for the four analytic dimensions corresponding to each case in an APPENDIX. (A complete version of each case with detailed tables is available from the authors.)

OLF 5. T1: During the first three months, only the founding message (1)¹ is posted, and it is broad in scope. The only specific referent is to "IT" (information technology) as providing "powerful tools." The message tone is informal and friendly.

T2: There are 14 messages, and all are brief (1-2 lines), direct, and polite in tone. They include relatively broad queries, such as, "I would like to exchange some information with you about lotus notes (sic) and domino (sic) 4.6" (4) and "Is sound management only finance and accounting?" (10) For the most part, the replies tend to be as succinct as the queries, pointing out web sites, stating brief opinions, or offering to send a report or other information. There are two messages providing information that are not replies; in one message, the contributor informs the other participants that he wrote a report on KM software enablers, and this message has six direct or indirect follow ups. Most messages have the contributor's complete name (family name and given name) prominently linked to the message subject

¹ Numbers in parentheses refer to messages, sequentially ordered for each OLF.

header (e.g., “Christian Pousson”). However, most have no greeting or signature and include no legitimacy statements (such as references to prior experiences or the OLF message history). Only four messages include any legitimacy or signature, and these are all from student researchers who are requesting information about KM for their studies. The students introduce themselves and sign with their first name. Many messages conclude with a brief “thanks,” but otherwise there is no evidence of using linguistic style to develop informal or personal relationships among contributors.

The founder posts one message in T2, as a reply to a discussion. Notably, this is a bilingual message, both in English and French, and the only in the forum. The founder does not sign nor use any authority discourse. There also is a message with a personal address to the founder, requesting an appointment. This is the only reference to some sort of off-line relationship in the forum.

T3: Again, all the messages are brief. As in T2, about half of the contributors use greetings and feedback for minimal relationship management (“hello,” “thank you”). There are four signatures but no signature files. Legitimacy discourse is rare. As in T2, there is no facilitator, no moderator, and no core group. The founder is inactive. None of the contributors refers to a community. There is no evidence of group identity. As in T2, conversation is sparse and continually involves new contributors. Often newcomers join existing discussions rather than creating new discussion threads, suggesting that they are taking the time to read (at least some) of the discourse before joining in. Messages posted in T2 receive replies in T3. Looking forward in this OLF, we note that it is common for newcomers to reply to discussions initiated months, or even years, earlier.

OLF 25. T1: GV, the founder constantly celebrates growth (e.g. (6) “we are finally in double digits...”). He also plays a role in stirring up discussions, raising questions, challenging the group to respond, and, at times, summarizing a discussion thread. For the most part GV acts as both moderator and facilitator; however, at one point (68) GV shifts his style and forwards articles and references without commentary, and without greetings. Then at message (85) he reverts to back to the facilitator role, commenting: “nice to see this egroup churning rich thoughts.” At (103), he announces that he is not moderating the forum anymore. Yet, this announcement does not change the frequency, tone, or content of his subsequent

messages. Although GV is the most active contributor, there are three other highly active contributors and some less active contributors whose messages generate extensive discussion. Participants discuss a wide variety of KM concepts, definitions, technology, and so on. “Hi All, Could you share your practical experience on COPs as how its being implemented in your Company etc?” (117). Most of the messages are fairly long (20-30 lines). Information seekers give detail on their interests and the context of their questions. Those providing information give extensive explanation.

The building of the community is a key topic in T1, with GV’s messages often hailing the latest number of participants. There are many references to well-known professors, some joining the forum, accompanied by enthusiastic welcoming messages, such as, “it gives me a great pride and pleasure to welcome Dr. M.S.” In addition, there are many references to the forum as a group. Newcomers introduce themselves – often indicating that they have been lurking for a while. It is clear from the names, signatures and some explicit geographical references that this OLF is based in India. It seems that some people know one other, at least by reputation; however, there are no references to off-line meetings and, hence, no embodiment.

The tone is informal and friendly. Contributors make heavy use of parentheses to embellish their text. This creates an oral style. They also use punctuation (exclamation and question marks) to express emotions. There are quite a few e-mail messages that are forwarded to the group. This pattern could be interpreted as an attempt to build community: “let’s share all what we have; let’s avoid side discussions,” (though it is not explicitly stated). Contributors also tend to make reference to other messages (“this is in response to S’s message...”), legitimizing the speaker’s contribution and giving a sense of connection among the discussions.

T2: GV is still the most frequent contributor, and acts as moderator and facilitator. In fact, a discussion arises on the role and necessity of having a moderator following an aggressive exchange of messages. GV indicates that he is not a moderator anymore but nonetheless acts the part by stating rules and advice: (167) “when this egroup was started it was moderated so that such occasions do not occur. When they did not I made the group unmoderated.” Until the end, he more or less keeps moderating the

forum. In this segment PP, a consultant, starts posting messages: “I am interested in developing a network of Indian thinkers” (202); “I would like to dedicate some additional time to this forum” (211). PP posts frequently and in a few instances acts as a moderator. For example, (240) he welcomes a newcomer, and states that he would like to start building a KM group in India tied into an agenda that he has defined. PP has a distinctive discourse style; he invokes authority, referring constantly to his work and his collaboration with great KM names. He does not try to facilitate the discussions or have feedback but instead makes pronouncements.

Along with GV and PP, several contributors post three or four messages in T2. As in T1, participants tend to use some legitimacy (introduction of self) and authority discourse (citing their experiences). In T2, there are many references to a common identity as well as some discussions about behaviors that are acceptable or not in the forum. There is a lively discussion on the nature of a healthy discussion, on the role of the moderator, and appropriate behaviors for the forum. A newcomer posts a message indicating that he felt lost and disappointed by the exchanges he read on the forum (152): “My experience over the last 3 months has left me more confused and ignorant than before...” One participant replies to this message with a nasty message, which leads to a discussion on appropriate messages and the definition of the forum. Participants then agree on the importance of being open-minded and polite and the key role of the moderator. One contributor makes a point regarding the difference between the type of discussions to be made online and those that need face-to-face contact. He ends his message with these words: “the best use of this forum is to share practical experiences...a group like this serves as solace, sounding board (virtual friend, philosopher and guide)”(159). As in T1, people use “we” and “us” to refer to the group. At a few points when the discussion slows, several participants comment on the low activity (174; 197; 243). The style remains informal and friendly with many references to the forum and the Indian KM community, with the latter now identified as “a network of Indian thinkers” (202). Participants still make heavy use of parentheses, message forwarding, and targeted references to other messages. Positive feedback increases (“good idea,” “that was a valid point,” etc.).

References to gurus continue. Information providing is more frequent than information seeking; many messages include excerpts from printed or electronic materials related to KM, cut and paste of articles, URL addresses, etc. There are also general discussions about definitions and concepts, and discussions about practical issues in specific contexts. GG spurs this kind of discussion, and quells conflict, for example:

GG (155): "... if you and other members of this e-group have been thinking that it will be easy to take a few defined concepts and find out what KM is... then I regret to say that this need will not be fulfilled at this forum... I believe that sense making is the actual knowledge creation process for the community..."

T3: GV remains the most active contributor, acting as both moderator and facilitator even when, at times, explicitly denying the role. He writes: "Dear all, I am not going to be accessing the net or mails over the next three weeks, hence I am making the group unmoderated. Please keep in mind the objectives of the group and if somebody violates them, please do not hesitate to remind the person of the same. Keep the spirit and ethos of the group and take it higher" (344). PP continues to post long, complex and theoretical messages in the form of pronouncements, without seeking feedback. He is the second most active contributor after GV. He seems to use the forum as a stage to express himself. He posts several aggressive messages arguing with another well-known consultant. Some other participants then start to facilitate, stirring up involvement of other participants. There is a core group of five contributors (including PP but excluding GV). Participants still use legitimacy and authority discourse. Newcomers follow the patterns of T1 and T2, typically introducing themselves, stating their experience, and saying why they are interested in KM.

As earlier, contributors regularly refer to the group and its shared history, although use of "we" and "us" declines in this segment. At one point a contributor calls on participants to learn more about human resource policies in specific companies, and he generates many replies. Frequent references to "the Indian KM community" continue but, as before, no mention of offline interactions. Participants persist in the prior style of using parentheses, forward patterns, and giving positive feedback. The tone remains

informal, although some tensions arise among participants as reflected in several aggressive messages and pointed arguments.

OLF 15. T1: Sam, the founder, both moderates and facilitates the forum and is the second most active contributor. In (156), he gives an update of the numbers of members and forwards an extended version of the founding message, explaining the aims of the forum, its structure and its “rules.” There is a core group of active contributors, and the facilitator role is shared among several members who guide discussion. TA, a consultant, is the most active contributor. He posts “the KM snips of the day” which are mainly extracts of articles and books, most with no comment. At a certain point in T1, most of the conversation is between TA and individual contributors who comment on his snips. TA is at the center of the conversation and dominating the forum. The messages contain buzzwords and consultant-speak.

People refer to some thought leaders, e.g., “Karl-Eric Sveiby and other KM notables” (78), “James March as a pioneer guru ... and another guru of mine...”(139), “well-known guys” (145), but such references are not extensive. There are several references to an organization: Sam refers to the coordinating committee (143) and to Anita “our secretary [who] manages the list” (156). Participants seldom use legitimacy and authority discourse. Most sign their messages, but the pattern varies (either first name, first and last name, or signature file). At one point, there is a whole discussion on the importance of presentation of self and of the need to fill in the personal information section of the forum. (The moderator posted a message (8) at the beginning inviting people to do so, but it seems that many forum participants did not comply.)

A strong sense of community pervades this forum right from the beginning, through general greetings (“hi all”), references to the group, use of “we,” and through an informal and friendly style of speech. Some newcomers introduce themselves, but there is not a consistent pattern of introduction. There are some references to the larger KM community, to the Australian context, and to the public sector, but not many. Most references are to the OLF itself. However, there are many references to physical locations, to face-to-face meetings – especially to their monthly meeting that will become central in T2 and T3; and many contributors invite other members to contact them offline. Some messages read like a

synchronous chat. For example, people reply immediately “today, TA’s snip of the day” or use time-specific greetings, such as, “good morning.” Immediacy is reinforced through an informal and friendly tone of speech: “hi all, I can’t resist that one” (82); “Jew, even now!?” (111). People sometimes post only a few lines, without setting up the context and or stating who they are. The assumption is that everybody knows them. Contributors make heavy use of parentheses to make extra comments, and this reinforces an oral style. Smiles and capital letters are used to express emotions, whether gratitude or tensions. Messages refer to other messages, generating a feeling of a shared history and lively discussion. Most of all, participants give extensive positive feedback, which reinforces the sense of community and an accumulated experience of shared sense making: “this is an excellent idea,” “I agree,” “great idea,” “I am fascinated by TA’s explanation,” “hello, looks like a great group and a great idea.”

T2: Sam is still very active as a moderator and a facilitator: “great to see the discussion about the proposed name change to OLF15-KM² forum. I think we are close to clarifying the alternate viewpoints. I will draw the threads together in a future message.” (216). As a moderator, he is in charge of calendar issues, the name of the forum, and netiquette. He also creates polls, welcomes newcomers, and manages the group message repository. He is perceived as a key actor in the forum as this message attests: “Hi Sam, congratulations on the continuing success of the OLF15-KM group ☺”. Anita who was already active in the management of the meetings in T1 is even more active. She sends reminders and complementary information (e.g., venue or change in time) for the meetings. The facilitating role is shared between Sam and several other contributors, especially PD and BJ, who also play a role in the management of the forum. Positive feedback message are numerous. At one point Sam asks for volunteers to present at the monthly meetings receives many positive replies, which shows the commitment of the participants. The organizational structure of the forum emerges more clearly than in T1. Messages start to be posted by an “administrative” address, roles are clearly evident, and there is reference to the “executive members” (308).

²The forum number is substituted here for the actual forum name as used by the contributors.

TA, who was the most active contributor in T1 (36 messages,) posts only five 5 messages in T2. Although Sam dominates in number of messages, there is a large core group and a sharing of responsibilities. There are some references to gurus. KY asks for “names of leading experts on KM (academic or practitioners). Or companies that are leading examples of knowledge organizations in Washington and Boston” (221). As in T1, there is an atmosphere of community with many general greetings (“Hi all,” “Hello everyone,” “Dear members of the group”), reference to the group (“members of the olf15-km list might be interested,” “I would like to introduce myself to the group,” “please can group members...”). There is reference to only one newcomer, but as the group is very embodied, most of the participants might meet, or have met, in the monthly meetings.

T2 is a key period in terms of community building. There is an extended discussion concerning the name and the focus of the group. “Should we change the name of our group to the Public Sector KM Forum to emphasize our public sector interests and de-emphasize the geographic boundary (of Australia)?” (199). After many discussions and a poll, Sam concludes: “The result is inconclusive... I think I have convinced myself that a name change is unnecessary. We just need to build the online community so we all benefit from great discussions online” (251). As in T1, there are two messages that invite participants to give a short introduction as a way of building the community. There also is an important thread on netiquette. As in T1, there are several references to the Australian context, but still one contributor writes: “the online community is obviously unconstrained by geographical boundaries and I’m certain there are other KM practitioners who are interested in public sector KM issues and who reside outside the AT³. I think we should invite these people to join the group” (251). The current group is strongly embodied. As in T1, there are repeated references to face-to-face meetings (the monthly meeting and others). Many messages end with “I’m looking forward to catching up with you again / to seeing you...” Many messages refer to discussions that took place in a meeting or suggest using monthly meetings as a place to follow up discussions and explore some ideas that arose online. Many messages reflect some intimacy among some of the members of the forum. They make reference to off-line

³ Australian Territory

interactions or events; they indicate that they meet offline or know what some others are doing, or they make personal comments about their whereabouts or activities: “BTW, it’s great to be back. I’ve been over in Boston looking at Lotus’ new solutions that tackle the issue of expertise” (193).

The general tone remains informal and friendly, with the feeling of a chat discussion. Some contributors tend to refer to previous messages as an introduction to their message. As in T1, there is ample positive feedback (“totally agree”, “I read your interesting comment”, “and great to see the discussion,” “thank you Amos, these links are most valuable.”

T3: Sam continues to act as moderator and facilitator. (He signs one of his messages, “Sam C /Convenor / AT Forum”), but as in T1 and T2, he shares this role with a core group of active contributors. TA, who was the most active contributor in T1, posts only four messages in T3, and not a single KM snip of the day. Anita is very active in T3. MS enters and takes on an organizational role; he signs his first message in T3, “Mike S, and Organizing Committee” and is active in the organization of what is now called, “the inaugural workshop.” Messages from the administrative address of the forum are more frequent. These messages and the mention of different committees convey a strong and growing sense of an organizational structure. Unlike in T1 and T2, there are no references to gurus or well-known thinkers, apart from a list of names provided by Sam for discussants for the inaugural workshop. As in T2, there is little authority type of discourse. Comments such as these are rare: “I hope these comments and my experiences ... may assist you...” (338), “when I started as a regional manager with ABC 5 years ago...” (566). As in T1 and T2, shared identity is expressed through general greetings, the use of “we,” reference to the group, and the friendly and informal tone of speech. In T3, there are no more reflective discussions (as in T2) on the name of the forum or the netiquette. In that sense T2 was the community-building phase and in T3, the sense of a community seems to have been achieved.

Messages referring to face-to-face meetings (announcements, reminders, asking for speakers, providing logistic information) are pervasive. Many messages refer to what has been discussed in previous meetings or plans to discuss some of the issues mentioned online in future meetings. Thus, the face-to-face community seems to have become an extension of the online community. The inaugural

workshop is a major discussion top and seems to play a very important role in the structuring of the community. In fact, when Sam announces it (423), he describes it as an important event for building up the community, and Mike S follows: “by now you would all be aware that our inaugural workshop is only one month away and preparations are proceeding well. This action will help increase the exposure of the forum and perhaps result in greater membership of the group, as well as attendance at the workshop. I look forward to welcoming you on the 4th of October” (587). The importance of this event is repeatedly stressed and shows the embodied nature of the forum. As in T1 and T2, the style is still informal and friendly with use of parentheses, informal phrases (“I hope you all had a relaxing WE” ; “Hmmm? Was there any value in this exercise?”, “all sounding pretty good so far...”). There only two forwarded messages, some direct reference to prior messages (though most message linking is now implied), and continuation of the prior pattern of high positive feedback. There are also several messages where people cut and paste the previous message to reply to a specific point. This contributes to the conversational tone. Along with preparatory and follow-up messages for face-to-face events, discussions of KM concepts, challenges, and experiences continue. There are some rich discussions of KM practices, such as a thread on Milan family therapy and how it applies to KM, and discussions on rewards and incentives for KM.

Language Game Resemblance and Distinctions

Table 6 provides highlights of the language games of each forum, revealing family resemblance and distinctions. The forums quite obviously share a common interest in discussion of the KM theme, and we note that each sticks to this theme throughout the course of its development. New topics for discussion are continually introduced, but contributors almost never stray from their core concern with management and technology issues related to KM. Further, the forums resemble each other in their informal and direct style of conversation, as well as a rhythm of message posting and reply behavior that is established in the first few months of the forum’s life and tends to persist. Each forum has some degree of geographic identity; but they are open to anyone, and each experiences a steady stream of newcomers over time. To the extent that these forums all include information sharing among people over time, they are locales for

learning that promote electronically-linked exchange among players who otherwise would not regularly interact with one another. But beyond these general commonalities, the OLFs vary considerably in their goals, complexity, major players, player moves, and rules of participation. OLF 25 and OLF 15 share some common features, and OLF 5 is quite different from the other two. Each forum has its unique language game. One game is not necessarily better, or superior, to the others; they are just different, fostering different kinds of environments for information sharing.

Table 6 here

OLF 5 offers the simplest language game. There is only one type of player, and the moves and rules are minimal. Anyone can join, although few do. Conversation is very lean, with short, cogent messages. No one refers to rules or appropriate behaviors. Contributors give little or no details on the context of their query or comment and do not try to stir up discussions. Players tend to make one move and then leave. There is no feeling of a “group” of players but instead one-at-a-time moves. Still, the forum has a sense of organized discussion that slowly builds over time. There is some depth to the discussion in that contributors place their comments into established topical threads, or start new ones. It is a sparse yet ongoing conversation of transitory visitors, punctuated by periods of silence. Although the language game is unsophisticated, the forum is successful in that the game survives. (We note that this forum remains active for 5 years before going silent.) Social networks do not form. Instead, the game serves as a sort of *information kiosk*, or bulletin board. Visitors presumably gather the bit of information they seek, or provide information for another person, and then move on. Although interactions are limited, the forum appears to be an efficient game for dealing with focused technical and managerial information.

OLF 25 is a “clubbier” game, operating rather like a trade association or *guild*. People can join this game to discover “what is happening” and connect with those “in the know.” Participating in this game is more complex than in OLF 5. There are many more players, and a range of moves are possible. Before contributing, one is expected to read prior postings and link one’s comments to them, as well as to

exercise small rituals of politeness, introduction, and so forth. Participants have developed their idiosyncratic communicative practices, such as a forwarding pattern, the use of parentheses, heavy use of positive feedback, and references to previous messages. The forum's geographic identity in India bounds its scope and provides a common ground for those who participate. In addition, the founder acts as moderator and provides a sense of stability over time. There are opportunities to discuss a wide range of KM-related topics and issues, to relay ideas or questions, and to pursue career or general work advice. Some of the participants appear to know each other by reputation, even if they have not met; and the key players in the game (the founder and dominant contributors) play a heavy hand in the conversation. Gurus are highly regarded and receive special recognition when they join this OLF. Still, there is a welcoming atmosphere to all, an enacted goal to grow the size of the guild, and plenty of information about groups, forums, books, events, and so on, that may be useful to visitors. Scattered about the many, varied topics (threads) are several deep, nuanced conversations that debate the meaning of KM concepts and how to best implement them. Although it may not be clear to all the participants, the philosophy of the forum is to become a locale for exchange and "sense making," as GV's notes (155). In this sense, the game moves well beyond providing information per se; it is a source of networking among a loose collection of professionals whose discussions explore KM definitions, principles, and implications.

OLF 15 has the richest language game, offering a sense of *community* which gains strength and complexity as the forum develops. There are many players, a formal set of netiquette rules, and a sophisticated organizational structure in which players are invited to participate. There is a strong and active core group in this forum. At the same time, opportunities for newcomers to participate are plentiful. Participants can contribute to online polls, join discussions of KM concepts and principles, share project experiences, and/or attend offline events that are announced in the forum. Building of social ties is important in this forum. Participants are expected to speak in friendly and frank terms, to disclose information about their opinions or work projects, and, in general, to talk to others as if they know them. Long messages with personal experiences or reflections are welcome, but so are quick conversations that happen "live" over the course of hours or a day. The atmosphere of the forum is like a chat room in which

players can readily drop in and leave at their convenience, informally interacting with whoever is around at the time. A notable hallmark of this OLF is that it is strongly embodied with references to personal whereabouts (travel, meetings), offline events to which all are invited (seminars, meetings, the inaugural workshop). As the forum develops, the online community seems to become intertwined with the face-to-face community. Many messages are either follow ups to what has been discussed in the face-to-face meetings, reminders of meetings, or suggested questions for discussion in the meetings. Taken together, the play of this game creates a sense of intimacy, trust, and enjoyment for those who participate.

Although our analysis did not directly examine learning, the social dynamics of the three language games suggests that different forms of information sharing are being fostered via the emergent rules of these three games. In OLF 5 there is information processing taking place in the sense that there is an ongoing process of information seeking and distribution (Huber, 1990). However, the information sharing is not equivalent to co-construction of joint understanding, which is more evident in OLFs 25 and 15. The latter two forums place emphasis on social relationships, not just information exchange. Locational identity serves to reinforce common ground among the participants and, in the case of OLF 15, to foster their offline interaction. Depth of discussion is considerably greater in OLFs 25 and 15, compared to OLF 5, and it is particularly pronounced in OLF 15. Participants in OLF 15 receive, give, and circulate information and also engage in mutual construction of meaning. There is not only information seeking and reply but evidence of “listening” as contributors refer to each other’s remarks and build rich threads of conversation over time. There is more evidence of reciprocal interest and involvement in each other’s comments and, in the case of OLF 15, in each other’s professional activities in general.

DISCUSSION

Our research suggests that OLFs can, indeed, take on organizational properties and that these properties vary in important ways across forums. We observed a skeletal organization in the case of OLF 5, with only one notable role (the founder), little expression of legitimacy and authority, and no developed sense of identity. This forum relied on a patterned linguistic style, established early in its life, of short, dry

messages with simple greetings and closings, to provide the necessary rules to keep the forum active and sustain its long-term existence. More sophisticated forms of organization were evident in the other two forums we studied. In OLF 15, multiple roles emerged—most of them enacted by the founder—and the forum included an active core group of returning contributors. Routines of legitimacy and authority expression, coupled with a well developed linguistic style, provided additional structure and enriched OLF 15's information sharing environment. Further, OLF 15 established a sense of identity early on that was directly tied to the national culture out of which it formed and linked as well with the larger "KM professional community" of which the forum was a part.

The third forum we studied, OLF 25, had the most sophisticated set of organizational properties. This forum enacted an extensive set of roles, including committees, and developed a large core group of participants. In comparison to OLF 15, this forum relied less on legitimacy and authority to provide its structure and instead developed a strong, coherent organizational identity. Although tied to national and professional KM interests, organizational identity in OLF 25 was sufficiently separate from those so as to provide a stronger boundary between the forum itself and the larger social groups of which the forum was a part. Embodiment, more than common national culture, provided an important basis for identity formation in this OLF. Like the other two forums, the patterned linguistic style of OLF 25 was established early on and was informal and friendly in tone. But the routines of speech in OLF 25 were notably different, including a mix of both long presentation of ideas and short interactive sequences along the lines of a simultaneous chat.

In all of the forums, the establishment of the language game took hold quickly, in a matter of months. By T2, the routines seemed established, and, for the most part, differences between T2 and T3 were minimal. Both OLF 25 and OLF 15 were able to sustain conflict in later time periods without disintegrating, perhaps due to their greater organizational sophistication, and hence resilience, relative to OLF 5. It is possible that the language games in these forums shifted into new directions later in their lives, but our analysis of their first nine months of life indicates general internal consistency in the player roles, moves, and rules of each forum.

The primary contribution of our study is to illustrate how the language game paradigm can be operationalized to provide an analytical tool for investigating the organizational properties of online forums. All OLFs start by offering an electronic place that people can “go to” or “drop in” (Harasim, 1993). But it is not the social space that shapes a forum’s environment and constitutes its organizational form. Rather, it is the unfolding discourse among contributors. To date, most scholars have attended to the differences between newer online settings and their more traditional face-to-face counterparts. Our research reveals the variety of forms that online settings can create as a function of their language game--differences that cannot be explained by medium alone. Even among forums composed of managers and professionals discussing a similar topic, distinctive language games emerge. Through their language and actions, contributors take on roles, exhibit legitimacy and authority in their moves, and develop rules regarding these roles and moves; they use expressions of group identity to provide coherence and support for coordination, and an emergent linguistic style governs the process of their speech. By using the language game approach we have outlined here, researchers have a starting point for systematic analysis of OLF development, and for comparative analyses across electronic venues.

Our study is limited in a number of important ways. We examined only three OLFs and four dimensions of the language games. Our research was confined to a single topical domain, KM. We studied only the first nine months of each forum’s life; and we examined the languages game at the forum level rather at sub-levels, such as within subgroups or within discussion segments. It would be worth analyzing more forums and different topics in order to enrich and refine the descriptions of the three language games we discovered--the online line desk forum, the guild, and the community. Such analyses would provide insight into the generalizability of our findings, sharpen understanding of organizational distinctions among OLFs, and contribute to understanding of family resemblances. Language games may form among dyads or smaller groups within an OLF, or within specific discussion segments, and so future research might attend to these more micro levels of analysis.

We did not anticipate the regional connections we found in two of the three forums. Cultural differences, related to linguistic customs of India and Australia, were not incorporated into our analytic

model. Further research should include cultural factors of relevance to organizations and their discourse in order to enrich and refine the language game descriptions presented here. As a final thought for future research, we note that researchers have studied how online communities can enhance social interactions within physical communities (Churchill et al, 2004; Sproull and Patterson, 2004), but there is little understanding of the reverse relationship—that is, how physical communities impact online communities. We observed an important process of embodiment within the language game of OLF 15 as the players planned an inaugural workshop and held group meetings. Further study of the blending of digital and physical spaces, and how the embodying of each within the others' space affects their mutual development, would seem intriguing.

CONCLUSION

Whereas prior researchers have documented the language games of face-to-face organizations, relying largely on static texts (especially published works) and, in rare cases, samples of face-to-face encounters, our analysis extends the language game approach to the electronic environment, where discourse is dynamic, fully documented, and occurs over long time periods. Further, we have shown how language game analysis can be systematic and structured, even if largely qualitative. We have provided an analytic approach that can be used as a starting point for further inquiry into the different types of forums that emerge on the electronic landscape and the process by which they form as organizations.

As research in this area continues, it is important for researchers to recognize that, although OLFs may share family resemblance, each game is autonomous and has its own level of complexity and goals that does not presume its quality. “Community” is often mentioned as an ideal for online venues, but there is, in fact, no ideal OLF. Multiple forms are possible. A language game need not be complex game in order to function and thrive. So long as meaningful linguistic routines and related properties are enacted by a set of contributors through regular interactions and activities, the game survives, even as players come and go.

Language games contribute to formation of shared mental models and act as houses for group knowledge (Lyotard, 1984, 1985; Boland and Tenkasi, 1995; Koppl and Langlois, 2001). Further study of the dynamics of OLFs in terms of their resemblance and distinctions may prove helpful to the quest of understanding inter-organizational learning and how information sharing can be nurtured in online settings. By documenting the structure of dialogue within OLFs we can take a step toward understanding how these fragile and tentative organization forms give rise to ongoing learning environments.

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Figure 1. A model for analysis of language games in OLFs.

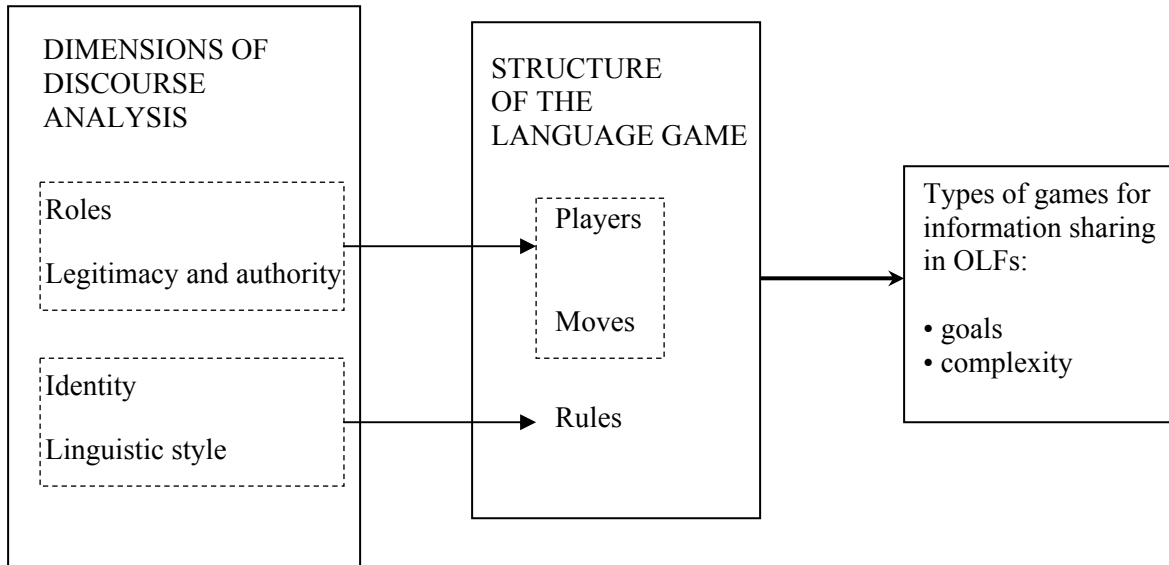


Figure 2a. Cumulative number of contributors for the first nine months of the three online forums.

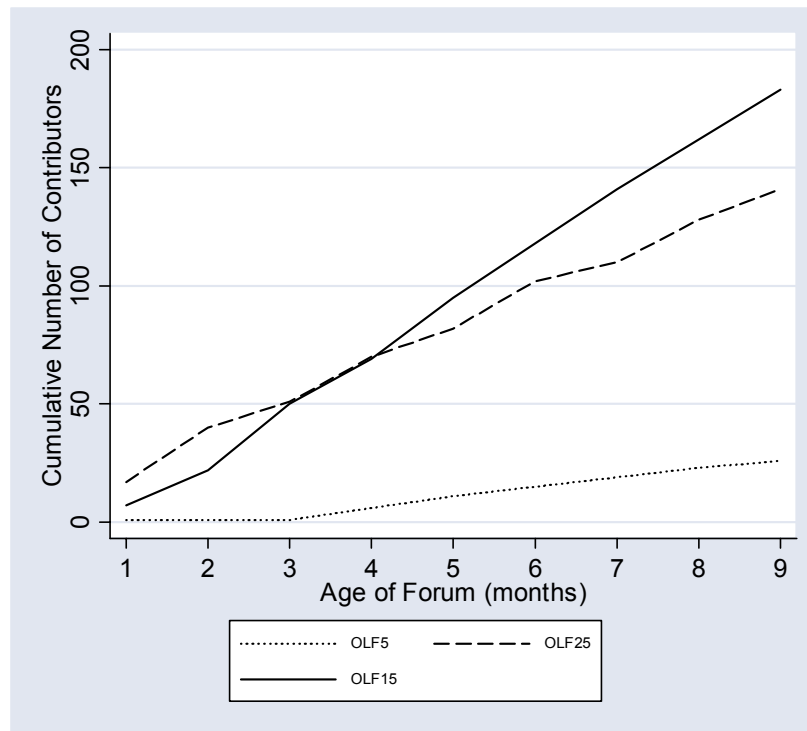


Figure 2b. Cumulative number of discussions per contributor for the first nine months of the three online forums.

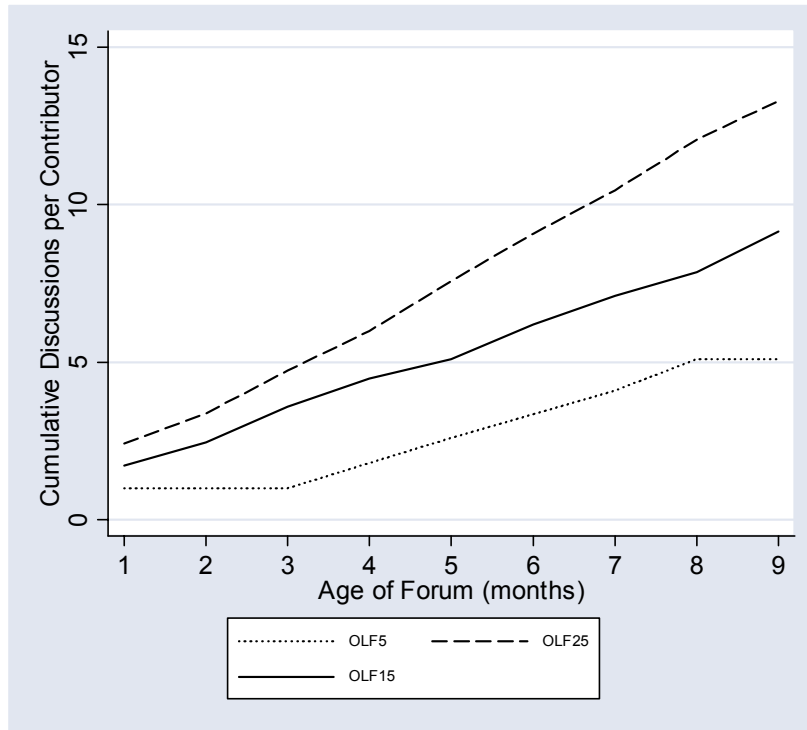


Figure 2c. Cumulative number of replies per contributor for the first nine months of the three online forums.

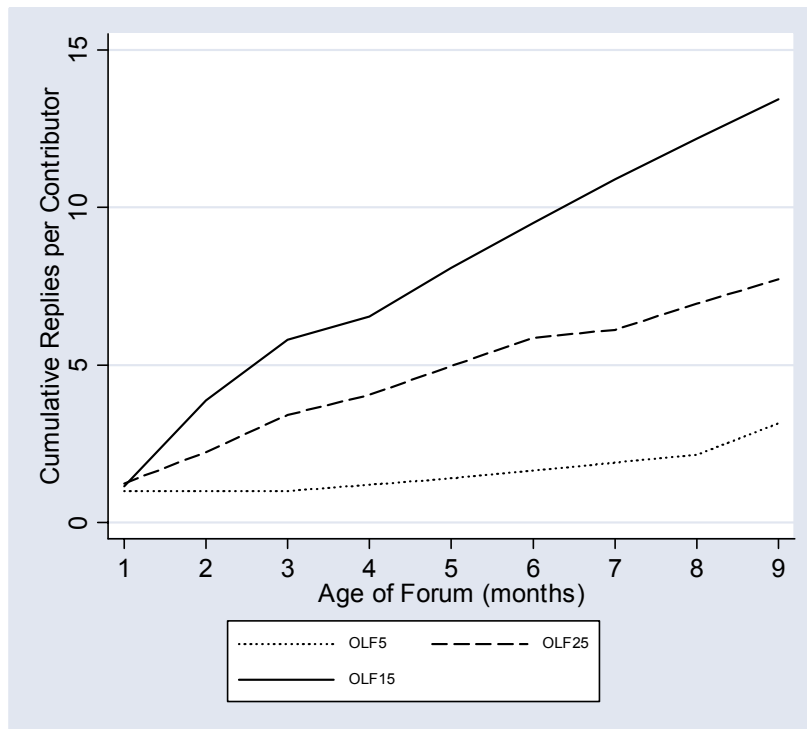


Table 1. Means, standard deviations, and correlations (significance level) between variables used to cluster analyze 40 OLFs devoted to KM.

Variable ¹	Mean	S.D.	1	2	3
1. Contributor retention	2.48	3.4	1.0		
2. Overlap	1.66	2.3	-.13 (.42)	1.0	
3. High volume contributors	7.22	10.9	.26 (.11)	-.23 (.16)	1.0

¹ To control for OLF size, all variables are ratios where variable = variable/contributors.

Table 2. Major attributes of three online forums.

OLF	Founded	Still active?	Part of portal site?	Access mode	Fee-required?	Contributor retention ¹	Overlap with other OLFs ¹	High volume contributors ¹
5	Jul 1998	No ²	Yes	Wweb	No	0	0.11	1
25	Aug 2000	Yes	No	Web/message	No	37	2.78	7
15	Dec 1999	Yes	No	Web/message	No	65	0.67	20

¹ based on average values for the 9-month period of the study

²As of this writing, OLF 5 is available on the Internet to view and post messages; however, the most recent posting was made on February 15, 2003.

Table 3. Total contributors, messages, and message types for the first nine months of the three online forums.

OLF	Contributors	Messages	Discussions	Replies
5	21	27	18	9
25	141	332	207	125
15	183	452	177	275

Table 4. The founding message of each online forum.

OLF	Body of Founding Message
5	<p>Hello, everyone, This forum is intended for discussing issues on knowledge management. Whether corporate or departmental, KM is useful everywhere and IT gives you new powerful tools. We will be very happy to hear from you. Please feel free to ask any questions you wish. Monique</p>
25	<p>Hi Samba and Anil, In around 1.5 hours after launching OLF 25G we are already three of us. You can view the OLF 25 home page at http://www.egroups.com/group/OLF 25G. If you have got a egroup login with the current id then you would not have any problem. Otherwise you have to register with egroups.com (remember, your identity is determined with your mail id)...and its a simple process. I have started adding whatever URL regarding KM that I have managed to get my hands on and you can view them at http://www.egroups.com/links/OLF 25G. Looking forward to valuable interaction! Regards, Gopal (GV) ***** Senior Executive- Knowledge Management Group, SLC Saty Computer Services Ltd., Delhi Virtual Home : http://members.delphi.com/gopal23</p>
15	<p>Hi, This Chapter of KMCI (Knowledge Management Consortium International) is a learning community dedicated to building knowledge about public sector knowledge management. We aim to provide an environment where members can create and share knowledge about public sector knowledge management issues. This environment consists of creating opportunities for members to have conversations and capturing our experiences for other members to use. This is done in a number of ways including monthly meetings, focus group discussions, message discussions and a repository of relevant information. Over the next twelve months the Chapter will pursue three themes. These are - Understanding how to implement knowledge solutions in a public sector environment. - Gaining a better understanding of the people aspects of knowledge management - Raising the profile of knowledge management among senior public sector managers through education Our ultimate aim is to be the pre-eminent source of public sector knowledge management knowledge. Cheers, Sam Carpenter</p>

Table 5. Background information on contributors based on coding of the first 20 messages in each forum.

OLF	Primary regional affiliation	Profession as revealed by contributor				
		Manager/administrator	Technical professional/systems specialist	Researcher	Consultant	Does not say
5	France	16%	5%	16%	0%	63%
25	India	45%	25%	5%	5%	20%
15	Australia	45%	0%	0%	0%	55%

Table 6. Summary of language games for the three forums.

	OLF 5	OLF 25	OLF 15
OVERALL GAME PROPERTIES (types)			
Game metaphor	Information kiosk	Guild	Community
Game complexity	Simple	Rather complex	Very complex
Enacted goal	Question & answer board	Growth in contributors; establish an open network for information sharing	Build a supportive professional group of colleagues
GAME STRUCTURE			
Major players	None (all participants play the same role)	Founder is central to the game, but anyone can post a facilitating message. Gurus are present to provide sage advice.	Founder, secretary, coordinating committee, organizing committee, executive members.
Location of players	Anywhere. French-speaking participants are welcome.	India	Predominantly Australia, but anyone can participate.
Core group of players	None (no one dominates)	Small, easy to penetrate by contributing to the OLF	Large, penetrate by becoming active in the organization as well as the OLF
Moves	Questions, comments, replies on KM technology and administration	-Discuss KM definitions and concepts. -Introduce new people into the group and encourage the group to be active in other KM groups/ activities. -Pass outside information onto the group (articles, book reviews, bibliographies, links, etc.	-Discuss KM definitions and concepts. -Share specific project experiences; seek and supply advice on concrete problems. -Seek or supply advice on meeting or organizational logistics. -Respond to polling questions with your views.
Rules			
--of roles	Anyone can play	Founder moderates and facilitates. If he becomes inactive for a time and others dominate, the group will call on him to moderate and facilitate. Review the discussion before participating and refer to it when you join in. Long messages with pasted material from other	-Founder moderates with assistance from a secretary. -Founder is primary facilitator, but anyone can try to facilitate. -An organization that supports the OLF provides structure.
--of moves	Keep it short, clear, and to the point.		Very long messages with your thoughts are welcome, but avoid a lot of pasted material.

--of legitimacy and authority	No need to introduce oneself or sign messages	forums are welcome. Introduce oneself, refer to work experience, projects and/or KM experience. Sign messages with full signature information.	No need to introduce oneself or refer to work experiences. Sign with as much (full signature file) or little (given name) information as you prefer.
--of identity (collective language)	Do not formally address individuals or the group.	Address the group as a whole. Express positive feelings toward the group.	Use friendly greetings. Address an individual or the group as a whole. OK to omit address if the group is in “chat” mode.
--of identity (embodiment)	Do not refer to specific places, events, or meetings of participants.	OK to announce seminars and general meetings, but do not use the OLF for meeting planning.	OLF generates interest in meetings and is a place to follow-on with discussions after meetings. Be welcoming of newcomers and urge them to become involved, both online and offline.
--of style (message structure)	No formal rules	Be aware of behavior that is acceptable or not in the forum. Convey a tone that is open-minded, respectful, polite.	Read the netiquette “rules” as posted by the Founder. OK to disagree and challenge others, but be friendly and polite.
--of style (greetings, features, feedback)	Keep the discourse informal. Do not request or expect immediate feedback.	Keep the discourse informal and inclusive. We want to grow and be welcoming to all. Positive feedback is essential.	Keep the discourse informal, even personal. Say what you really think, disclose information about your work, and have fun with others. Be welcoming of newcomers.

APPENDIX

OLF 5: Summary of results for the four major dimensions of its language game.

Game Dimensions	Indicators	Example Messages
Roles		
Founder	Posts only the founding message, plus one reply in T2	“Hello, everyone, This forum...” (1);
Moderator	No visible moderator	
Facilitator	No one facilitator. Only two “facilitating” messages	“We will be very happy to hear from you. Please feel free to any questions you wish.”(1); “Looking forward to reading you” (20)
Core group	None	
Guru	None	
Legitimacy and authority		
Legitimacy	Introductions of self are rare and made only by student researchers	“I am a 4 th year student at B, University, and I am in the process of writing my dissertation...”(12).
Authority	Very rare	“(I am) administrator for 3 Domino servers” (11);
Identity		
OLF identity	Only one reference, in the founding message	“Hello, everyone...we will be very happy to hear from you” (1)
KM identity	none	
Geographic identity	Web site indicates the founder is located in France and offers information in French and English. Messages are French or in English, one both in French and English	(no discourse suggests geographic identity)
Embodiment	none	
Linguistic style		
Greetings and signatures	A few simple greetings; two personal addresses provided; very few signatures and no signature files	“Hi Harry” (6) “Regards” (12) “Hello (...) Best regards, Julia Danny” (18)
Message structure	Short, dry messages; One or two lines / sentences	“To exchange information with you on Lotus Notes and Domino 4.6” (4)
Paralinguistic features	None	
Feedback	Minimal. Simple closings at the end of some messages.	“Good luck. More later” (15) “I would like... Best Regards”(18); “I’ll appreciate some help” (27)

APPENDIX (continued)

OLF 25: Summary of results for the four major dimensions of its language game.

Game Dimensions	Indicators	Example messages
Roles		
Founder (GV)	<p>Very active contributor.</p> <p>Moderates and facilitates the forum.</p> <p>Posts article summaries, copies of links, and email and other messages on KM topics from outside the forum. Sometimes summarizes the conversation.</p>	<p>“I sense that...discussions that happened took most people by surprise. So I would like to take a few steps back so that some understandings are clarified...for the whole group...” (28). “Hi Keshav, Would you be knowing what type of KM initiative are prevalent at (companies A and B)? Alternatively, could someone from these organisations throw some light on it?” (278). “arguments from a review of Applehans et al, Managing Knowledge...(review follows)” (132)</p>
Moderator	<p>Posts messages to inform the members of technical /administrative matters. Primarily played by the founder but shared by another contributor(PP). Founder enacts this role though he also declares the forum “unmoderated” at several points.</p>	<p>“Dear all, have uploaded the file that R sent me...” (286)</p> <p>“So I thought it would be an appropriate time to familiarize people to egroups” (20)</p>
Facilitator	<p>Praises the growth of the community; tries to stir up the discussion.</p> <p>GV is the main facilitator, but some other members also from time-to-time stir up the discussion.</p>	<p>“Thanks J and M for your responses. I am rephrasing your responses along with my doubt...” (143)</p> <p>“Hi everyone... I think it makes a lot of sense. Your views please!” (252)</p> <p>“I think that the comparison of various models might be instructive to all - particularly if there is little salesmanship and great detail as to the real features of the Model.” (283)</p> <p>“Any inputs from anyone?” (354)</p>
Core group	<p>A regular set of about seven contributors. GV is core throughout but others in this group change over time</p>	<p>“...a core of regulars keep the pot boiling” (190)</p>
Gurus	<p>Authors, professors, well-known writers and thinkers are referred to by others as knowledgeable. Some join the forum.</p>	<p>“It gives me a great pride and pleasure to welcome Dr. M.S” (3). “... I am sure the group will benefit a great deal to see the presence of Dr. R...” (170)</p>
Legitimacy and authority		
Legitimacy	<p>Introduction - presentation of self</p>	<p>“Hello, this is just to introduce myself. I have joined OLF 25 sometime back. I am with the Institute</p>

		of Management in the HR/OB area...(141). I just joined this group...I work in Bangalore. My company is... Experience wise, I am familiar with Autonomy and their KM product .I look forward to being a part and contributing to this group. (349)
Authority	References to previous KM experience are frequent, especially for newcomers but also in the midst of discussions	“However, as a practitioner myself, I have gained some insights over the last few months that I share here...” (353)
Identity		
OLF identity	Repeated references to the group, “we,” and “us.” Greetings usually address the group as a whole.	“We should believe in ourselves” (46) “Trust me, if I do something worthwhile it will be useful to all of us” (155) “welcome sir to the group...” (170) “Dear OLF 25 members” (189) “Nice to see this group churning rich thoughts” (85)
KM identity	Many announcements and invitations to join other groups related to KM.	“The GKEC is the first major international forum dedicated to global knowledge economics and its study of such considerations as knowledge as a commodity” (247) “KM Wiki - largest collaborative KM repository on the web - join us” (293)
Geographic identity	Extensive reference to the Indian context, and some references to particular regions and locations.	“to see if they are suitable in the Indian context” (153). “XYZ India is privileged to invite you for a session on ‘Benchmarking’... The session will be held in the Conference Hall of NIIT...New Delhi” (235). I am SK, from FMS, Delhi ...Has anyone got info on Indian companies looking at KM? (310)
Embodiment	Very rare.	“Sakar and I have decided to organise a face to face offline meeting of the Hyderabad chapter sometime in January... Also would request people in places like Delhi, Mumbai, Bangalore and Chennai to also take the initiative and organise your own chapter meets...” (187)
Linguistic style		
Greeting and signatures	Nearly always. General greetings to the group, personal addressing, statements of closing regards.	“Hi Shanti,” “Dear Vibha,” “Hi Group!” “Hi Pals:” “warm regards,” “best,” “my respects”
Message structure	Many long messages presenting ideas, experiences, or opinions.	“Phew! I guess I’ll leave it at that” (21). “There might be repetitions

	Polite and informal tone.	from the earlier mail on KM tools. Please excuse” (184). “...i would like to disagree with Bala for usage of tools based on java, XML for information and knowledge generation...” (96)
	Generally positive, but disagreement can be expressed.	“A post by Darrin (I haven't asked you yet Darrin, but I'm assuming you won't mind!)... Gives us more and more of food for thought everytime!” (129). “News from D...”(313)
	Frequent forwarding to the group of email or other material that was sent to one individual.	“I came across this quite interesting case study on British Petroleum's Knowledge Shairing Virtual Network. worth a reading” (118)
	Frequent references to earlier messages, or copying of earlier messages inside the message.	“This is in continuation to G's response to Vibha's query...” (16)
Paralinguistic features	Extensive use of parentheses to recreate a conversational style. Use of emoticons, mixed case, and word abbreviation.	“It was my pleasure to welcome Dr. M. Sh. (OK, Sir, will drop the Dr. after this!)” (3). So go forth and Multiply ... knowledge i.e. ;-) (476)
Feedback	Giving feedback to acknowledge prior contributions; soliciting input on ideas just presented to the group.	“by for nw, cheers” (243) “Pushan, that was a valid point” (153). “Some really good insight from Nina” (340). “Please review the concepts I present. I would appreciate knowing how these thoughts are and are not judged as *relevant* to the current discussion” (346)

APPENDIX (continued)

OLF 15: Summary of results for the four major dimensions of its language game

Game Dimensions	Indicators	Example messages
Roles		
Founder (Sam)	Most active contributor in the forum. Both moderates and facilitates, and joins the discussion of the forum	“Another idea from our experienced virtual community members is to establish a code of conduct or netiquette for our group. If anyone was examples or ideas we should include in our code of conduct I would love to hear from you. The purpose is to encourage participation by creating a safe place for people to air ideas.” (218)
Moderator	Founder is the primary moderator, though he has a secretary who helps to manage the list. Contributors look to the founder to provide structure and announce the “rules” of the forum.	”If you want any help with the eGroup site...” (8). “Anita, our secretary, manages this list” (37). “my understanding that S was convenor of the OLF 25 and as such the appropriate person to post such notices...”(182). “..I have fixed this now so please post away “(342).
Facilitator	Founder is primary but this role is shared among other participants, who vary over time. Facilitator welcomes new members, creates polls, and stimulates discussion.	“A book you might want to look at is...I would love to hear about any references you come across” (60). “have people seen other great spaces that they would like to share with the group?...” (198). “your thoughts are welcome” (302) .
Core group	About 20 regular participants at any one time, though they are not formally identified in any way. Continual effort to involve newcomers.	“We now have over 160 people on the OLF15 Forum list. There must be heaps of interesting projects people are working on that they could describe online; we would love to hear about them” (329)
Gurus	Frequent references to writers and thought leaders who are outside the OLF discussion.	“James March as a pioneer guru... another guru of mine, Jeffrey Pfeffer...”(139); “Larry Prusak .. is the Director of the Institute of Knowledge Management (a joint initiative between IBM and Lotus) and author of numerous books and articles in the KM field” (223).
Other	Secretary	“If any other members would like to come along and introduce themselves and their projects, please let Amanda L know” (289).
	Coordinating committee	“Dear members the coordinating committee thought the group could benefit...” (143).
	Organizing committee	“The organising committee consists of the following people...The organising committee coordinates activities on behalf of the group and facilitates the development of the required environment for our learning community. (156)
	Executive members	“we are replacing two positions on the Executive...We would like to hear from those

public sector members who are interested in leading the development of the OLF15” (293).

Legitimacy and authority		
Legitimacy	Introductions with presentation of self are rare.	“I would like to discuss my background and current work which includes...” (232)
Authority	Reference to previous experience for authority purposes is infrequent and usually refers to past projects (rather than general experience).	“This is exactly what a number of us are trying to do in our organization...” (7). “This is of interest to me since my organisation is moving to...” (54). “I wish my organisation would consider...” (283).
Identity		
OLF identity	Persistent references to the group and use of “we.” Greetings are addressed to the group. Discussion of rules and appropriate (inappropriate) behaviors Discussion about the OLF name.	“our eGroup space...” (8) “If we are a group of people interested...” (23) “Dear OLF 15 people” (37). “Hello looks like a great group” (99). “With reference to our conversation yesterday...” (286). “apologies to the list for annoying all of you” (178). “Do list members really need to be receiving these sorts of emails?...” (358). “change the name of our group” (199)
KM community	Rare – occasional reference to other professional groups	“Prior to joining the Act Chapter of KM... I chanced to discover another KM-oriented group on eGroups.com...”(70)
Geographic identity	Mainly references to Australia	“the Australian context” (79). “As Brisbane-based member” (57). “because I am also interested in the Australian workplace” (109).
Embodiment	Repeated references to face-to-face meetings that are open to anyone to attend.	“we look forward to seeing you all at IPAA functions in the new year” (14). “looking forward to catching up with you at the ... meeting” (186, 189, 193, 840). “Last night members’ suggested that this would be great” (216)
Linguistic style		
Greeting and signatures	Often a greeting; nearly always a signature. Signature usually includes complete name, position, location, etc.	“Hello all”, “Hi there,” “Dear Sam”, etc. “Regards,” “Cheers,” etc. “I look forward to our conversations” (306)
Message structure	Tone is informal, friendly, professional. Forwarding is extremely rare. References: Sometimes include copy of prior message in a reply, or refer to an earlier message, but usually not. Instead, show excerpts of prior message.	“As you can see I have returned from the long drive to Perth and back.” (58) “Interesting article from Free Pint- with some good links” (195) Building on Ian's points... ...SNIP...>>> >>I think that in time and if we keep on chipping away at it, we will see...” (248). “Here is Part 2 of my comments on your response” (47). “Sam, snip --- etc.--- great idea...” (203).

	Structure sometimes like a synchronous chat.	I'd definitely come and do a presentation if appropriate (344). Yes (345). Yes (347). yes, any chance of the week before? (348). "I'll try to contact you today" (169).
Paralinguistic features	Use of capitals, emoticons, abbreviation. Sense of intimacy	"FINALLY!!!! Someone who agrees with me! ;-)" (112). "This is not Roger Malcom -- Is it???" (401) "my 2c" (228) "And as for you being a "pom"how's the cricket going? ;)" (995)
Feedback	Acknowledge usefulness. Heavy use of positive feedback and general feedback-seeking. Willingness to challenge or disagree with others.	"This is an excellent idea!" (25) "Does that make sense?" (76) "Thoughts, reactions please" (104). "...I'm not sure the market concept adds much value to discussion of knowledge issue, by the way. What do others think?" (110) "good point" (125). "Why does everyone seem to refer to "public sector members" constantly in the posts?. ..As I do not regard myself as a 'Public sector member' I feel I am being excluded ...I would like to simply clear up any misunderstanding on my part" (298). "Thanks for your input Richard. How does staff regard the performance-based promotion scheme and do you think it has contributed positively in creating a knowledge friendly environment?" (337)
