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Roles and Knowledge Management in Online Technology Communities : An Ethnography Study

by

T.R. Madanmohan
&
Siddhesh Navelkar

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Please address all correspondence to:

Prof. T.R. Madanmohan
Associate Professor, (Technology & Operations)
Indian Institute of Management Bangalore
Bannerghatta Road
Bangalore – 560076, India
Email: madan@iimb.ernet.in
Phone : 080 – 699 3116
Fax : 080 - 6584050

Abstract

The Internet is a heterogeneous network of millions of computers that is continuously evolving. The interaction among people around the world on the Internet has led to the formation of communities. Technical communities are groups who share a common interest in a technology. The literature on technology communities lacks a conceptual understanding of the roles of various players in the online community. An understanding of the different roles the members of the community dawn at different phases, and the impact of the roles on knowledge management is crucial to manage and sustain such online technical communities.

This study based on an ethnographic analysis of two technical communities identifies seven distinct roles: core organizer, experts, problem poser, implementer, integrator, institutionaliser, and philosopher. The impact of each of the role on knowledge management activities is discussed.

Introduction

The Community has always been one of the central concepts in social sciences and development. As increasing numbers of people use the Internet for interactive, multimedia communication spanning time and distance, online communities are emerging as new structures aiding trust building, increasing consumer power by applying economies of scale and enabling the personalization. Rheingold (1993). defines virtual communities as social aggregations that emerge from the [Internet] when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace. Online technology communities are virtual communities that share a common interest in a particular technology and develop not only technological routines, but language and mannerisms (Tushman and Rosenkopf, 1992). For example, initiatives such as Linux, Pearl, Python, XML are all managed by largely dispersed technical specialists who contribute to build, maintain, debug and install these systems. Online technology communities are in a sense ethereal communities of practice (Brown and Duguid 1991; Lave and Wenger 1991), a group of people informally and contextually bound and working through a codified exchange of information. They manage and direct distributed knowledge sources to develop schemas and subroutines, install and integrate them to develop robust systems and software.

Every online community exhibits some participation styles and structures. Clearly, technology communities are repositories of knowledge. The important question is how individual and group interactions contribute to community knowledge creation. The diversity of structure and form leads to interesting questions about the nature of online community. The literature on technology communities lacks a conceptual understanding of the roles of various players in the online community. An understanding of the different roles the members of the community dawn at different phases, and the impact of the roles on knowledge management is crucial to manage and sustain such online technical communities. Technology communities and the roles is particularly interesting study for two reasons. Firstly, technology community member's roles explicitly contain diverse organization and knowledge related tasks. Secondly, technology communities have not yet been empirically analyzed from this perspective. Main purpose of this study is to explore roles in a technology community in order to develop a grounded understanding of how does each role contribute to production, codification and standardization of knowledge. Following Blacker et al., (1993) recommendation that research on knowledge work be focused on what people do, i.e., their work practices, rather than what they know forms the basis for this study. Based on an ethnographical approach attempts to uncover the various roles and their impact on knowledge management. Particular emphasis was placed upon clarifying the roles from the point of view of activities, and episodes of knowledge related events, rather than an emphasis upon statistics relating to particular characteristics. The study is therefore expected to contribute to the theories of individual members roles and also provide useful analysis of knowledge management practices.

The paper is organized as follows. Firstly, the structure and characteristics of technology community will be described in order to understand the roles from community and

knowledge management perspective. The following sections describe the methodology adopted and analysis and managerial implications.

Technology communities and knowledge management

Van de Ven and Garud (Van de Ven and Garud, 1989, 1994; Garud and Van de Ven, 1989; Van de Ven, 1993) were among the first to develop and apply a sociologically based technology community framework. Van de Ven and Garud state three distinctive features for their approach. First, they explicitly look at the actual processes by which extraordinary innovations come to be commercialized. The literature is portrayed as generally treating extraordinary innovations as randomly occurring externalities. Their analysis suggests a more understandable and systematic process. Second, Van de Ven and Garud construe extraordinary innovations as occurring through an accretion of numerous small events, rather than through major discrete events. Third, they fault previous work for assuming unidirectional causality, from either the technological or the institutional side. Thus, technologies and institutional frameworks 'co-produce' each other.

Tushman and Rosenkopf (1992), define 'technological community' as the set of organizations that are stakeholders for a particular technology or product class. This includes suppliers, manufacturers, user groups, government agencies, standards bodies and professional associations. Particularly important are 'Cooperative Technical Organizations' (CTOs) that are seen as guiding the community. According to Rosenkopf and Tushman, the technological community coevolves with the 'technology cycle' in a sociocultural evolutionary process of variation, selection and retention. The evolutionary dynamics of community organization refer to changes in the actors, linkages between them, and the power held by them. Barnatt (1996) argues that fragmented, uncoordinated organizational communities fare poorly compared to better-organized communities.

In developing an understanding of community level knowledge, we begin with the distinction between tacit and explicit knowledge. Tacit knowledge was defined by Polyani (1962) as knowledge that is nonverbalizable, intuitive, and unarticulated. Spender (1996) suggested that tacit knowledge be better construed as knowledge that is yet to be abstracted from practice. Therefore, tacit knowledge is context specific and personalized in nature. Explicit knowledge in other hand may be formal, systematic and include facts and symbols (Kogut and Zander, 1992). Following Zander (1991) tacitness can be divided into: teachability, articulatedness, and complexity. Teachability focuses the amount of supervision needed to teach someone to do an activity. Articulatedness is dependent on a standardized, controlled context for the performance; based on a set of simple parts that relate to one another. A manual is an organized schema of instructions. Complexity has to do with the amount of information required to characterize the knowledge in question. In the context of a technology community, knowledge creation and assimilation is a function of socialization and social activities of individuals within them about tacit knowledge. Degree of teachability, articulatedness and complexity define the knowledge management mechanisms that a technology community embraces. In these communities members (based on common interests and goals) interact directly,

use one another as a sounding board, and teach each other. Wenger (1998) terms such groups as Communities of Practice, wherein workers themselves through an organic and unplanned process discover the groups and the process of sustaining the sharing of knowledge. Individuals constantly acquire knowledge, share it with their organizational community, and thus increase the collective share of knowledge. The emphasis is on practical aspects of practice, everyday problems, development of new tools and things that work and don't (MdDermott, 1999). Lerner and Tirole (2000) based on labor economics, especially the literature on career concerns argue that the individuals have a strong incentive to join and participate in such knowledge creation activities to sustain and improve their skill sets

Social constructivist theory argues that learning is a social process of acculturation into an established community of practice (Vygotsky, 1978). Within this social process, learning takes place when it is sustained, experimented, collaborated and connected with other members. Knowing, doing and belonging thus form inseparable stages of knowledge generation and diffusion in communities. Specific knowledge management processes are at work in a community. At level one, the critical process is problem identification, interpretation and sense making. At another level it is integrating several solutions and institutionalizing (Inkpen 1996). Institutionalization encompasses legitimation, regulation and standardization (Van de Ven, 1993). Legitimation events include activities undertaken to publicize, support and legitimate product innovations. Regulations and standardization activities is a set of complex and evolutionary set of private and government initiatives.

In summary, knowledge as a public good is shared or rented and it is closely related to action (Stehr, 1994, Schultze, 2000). So far, however, the various contributions to the literature on technology communities, as a body, lacks a conceptual understanding on the roles of various players in the online community. An understanding of the different roles the members of the community dawn at different phases, and the impact of the roles on knowledge management is crucial to manage and sustain such online technical communities. The current level of theorizing on these questions is too fragmented and diverse to allow knowledge to accumulate readily. There is a need for empirical studies that contribute to a better understanding of the roles in online technical communities.

Methodology

Roles in a community can be studied by broadly two means. Discovering the roles being an unobtrusive participant one self or by interpreting the roles through others. We decided to use an ethnographic approach, following the precedent of some other important studies of cyberspace (Reid 1991, Turkle 1995; Baym 1996). Ethnography is the acts of both observing directly the behavior of a social group and producing a written description thereof. Ethnography is a traditional method of sociology and cultural anthropology. It involves the study of people performing activities and interacting in complex social settings in order to obtain a qualitative understanding of these interactions. In ethnography the "description of cultures becomes the primary goal... the search for universal laws is downplayed in favor of detailed accounts of the concrete

experience of life within a particular culture and the beliefs and social rules that are used as resources within it." (Hammersley & Atkinson, 1995). The method requires the researcher to closely observe, record and engage in the daily life of another culture, and then write about it in descriptive detail. However, conducting ethnographic studies, especially online, poses several problems.

According to Katz and Kahn (1978) role behavior refers to recurring actions of an individual, appropriately interlinked with the repetitive behavior of others as to yield a predictable outcome. To identify repetitive behavior in online communities, especially using ethnographic methods in cyberspace pose several problems that are different from the ones they are likely to encounter in research off-line. The major problems are: locating the parameters of the population of study, whether or not to depend on online interviews, and the frequent misinterpretations caused by the absence of physical cues and gestures in text based virtual environments. We know that the use of the Internet and online technical communities such as Linux is growing rapidly, and that the language of these virtual inhabitants is almost always English. We also know that the user of these sites requires not just literacy, but competency in computer languages, architectures and be involved in high-level programming. Since the principal discussions are technology centered personal characteristics such as age and gender as well as listing hobbies and other interests are not relevant. For this study, we captured publicly posted e-mail messages such as requests for information, bug reports, suggestions for bug removal, and general meetings. All publicly posted e-mail messages from both communities: XML-EDI and Bharath Linux User Group (BLUG) formed the population space for analysis. The approach follows the recommendations of Paccagnella (1997) and Miller and Slater (2000) for using ethnographic approach to analyze online groups. Appendix 1 describes the focus, organizations and interactions of the researchers with each of the community.

Another methodological question faced by researchers of online communities is whether to depend solely upon online interviews or observations in the gathering of data. Turkle (1995) states that, "virtual reality poses a new methodological challenge for the researcher: what to make of online interviews and indeed, whether and how to use them. She choose not to use online interviews in her research unless she has additionally met that person in real life. However, Turkle maintains that her choice not to use online interviews is based on the focus of her work, not for fear of fundamental flaw in the method. However, some researchers argue that there are certain advantages to interviewing people in their own environment. According to Hammersley and Atkinson (1995) "interviewing them on their own territory... is the best strategy. It allows them to relax much more than they would in less familiar surroundings." Online interviews provide the researcher of cyberspace the opportunity to observe people in their own surroundings. This can itself provide important data, such as giving the researcher an idea of the technical prowess of the respondent. It also allows the respondent to feel more at ease during the course of the interview Since we were using public e-mail message from every member as the data for the study we chose not to interview the sender.

Analyzing primarily textual discourse (e-mails) is perfectly suited to Mead's (1938) approach, in which the ultimate unit of analysis is not the person but the behavior or the

act. In such analysis, informants are presumed to be presenting a more carefully cultivated and controlled self-image. The uniquely mutable, dynamic, and multiple online landscape mediates social representation and renders problematic the issue of informant identity (Turkle 1995). Exhibit 1 presents an example of thread of e-mail listing which was used for analysis.

Each e-mail message was analyzed using pattern matching and explanation building, as suggested by Kozinets (2002). We used checklists, and event listings applied within and across each e-mail. In order to create a summary of the roles without imposing an interpretation of events, the following strategy was adopted. Each e-mail was used to identify the role of the e-mail sender (whether asking for information, suggesting some solution, leading to a standard) and what actions did a particular mail receive responses were identified. All threads (an event linked serial communications) of an e-mail were analyzed. Each e-mail was coded initially by an individual and again as a group to reduce individual biases. As is the norm with qualitative research techniques, no attempt was made to operationalise or measures a concept on an apriority basis.

Results

Knowledge management functions in a technology community depend on three fundamental flows: narration, social construction and collaboration (Teigland, 2000). Narration aids in members of the community helping each other in making sense of non-canonical information. With knowledge intensive tasks no one individual can master the technique (referring to a method or approach). By relying on community individuals save on search and experimentation. Through collaboration and narration, the members of a community socially construct their world, with its own symbolisms, language and social order. In technology community participation of members happens in sending messages, responding to messages, organizing discussions and offering activities of interest to members. Members create relevant content to be consumed regularly by others.

The technology communities exhibit certain characteristics and norms of behavior, described below:

- Enthusiasm for the purpose of community is found in plenty; members are ready to give their own time (or money) and contribute to the cause, arrange group meetings, spread the cause. The technology is not be seen as a way to make profits or advance one's career, rather it is a hobby and a passion. No staunch supporter and community member can tolerate any kind of remark against the technology, and is ready to counter it, and the reaction can be logical or emotional. For example, a reaction to a posting on a mailing list that claimed that Linux is useless is shown in **Exhibit 2**.
- Respect is given to community members who have more knowledge. An expert's word will bear significance: it is an accepted fact that hands-on experience and tinkering with a system makes you more wiser. Therefore in forums of interaction, there always exist certain members whose advice or word on matters is valued more.

For example, on Undernet IRC, there is a concept of Operators (referred to as Ops), who get this designation only when they prove their worth at Linux know-how. Similarly on XML/EDI mailing lists one finds more postings coming from specific members; other users try out their advice and slowly they build a reputation in the community.

- The RTFM (Read the Fine Manual) Philosophy: Members believe that new users should read FAQs, HOWTOs, Manuals[1] and learn by themselves, as this is how most of them have done it and this is the best way you can be a 'hands-on' expert. For this reason, any newbie who asks questions that are basic is pointed[2] to the relevant document. Only if the problem is complicated or such that there is no documentation, then an expert may step in and recommend what is to be done. An expert will always be reluctant to give solutions to trivial problems – one will find intermediate users more helping!
- Technical advice to new users is not given on a theoretical basis; it is more on practical knowledge and experiences. The rest of the community does not appreciate wrong advice to new users; the person is sure to get a warning or a punishment (as in getting kicked out of the channel room)!

Roles

A member of the technology community can go through various stages as she learns more: as a *newbie (*a person who is new to system and its workings), *intermediate* (a user with sufficient know-how to use a system and learn more), *advanced* (capable of solving others' problems and involved in propagation of the virtues of system), and *an expert* (whose word in matters related to system is final; has deep knowledge about the functioning, as well as its advocacy).

In her evolution from a newbie to an expert an individual member discretionally interacts with others. While every community, their purpose, individual members are different, there are certain common participation styles or patterns that are common. As technology communities grow and evolve, the roles of individuals within them formalize. Knowledge management functions in a technology community depend on three fundamental flows: narration, social construction and collaboration (Teigland, 2000). Narration aids in members of the community helping each other in making sense of non-canonical information. With knowledge intensive tasks no one individual can master the technique (referring to a method or approach). By relying on community individuals save on search and experimentation. Through collaboration and narration, the members of a community socially construct their world, with its own symbolisms, language and social order. In technology community participation of members happens in sending messages, responding to messages, organizing discussions and offering activities of interest to members. Members create relevant content to be consumed regularly by others. Analysis of the data produced seven distinct roles as shown in Table 1.

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[1] Linux based applications are supported by good documentation specially meant for do-it-yourself efforts.
[2] Here one may say to the newbie: "RTFM!"

Core organizers role involves acquiring funding, heightening visibility and ensuring participation of key individuals to make the technology community successful. In the early stages of the community this person will develop relationship with all the members as he/she motivates encourages and elicits involvement from and for the group. In case of XML/EDI, Bruce Peat and David Webber formed the group, invited Martin Bryan to contribute the white paper and lead the discussions. They posted the initial draft of "Guidelines for using XML for Electronic Data Interchange" on their website and Bruce Peat sent mails to XML developers inviting them to join the group.

Members take on this role because they care deeply about the practice and the community's success. They are not chosen or nominated, but emerge from the ranks of the members. The organizer may own the technology infrastructure facilitating the communication and by virtue of it they often emerge as a dominant actor of the community (Butler, et al., 2002). Core organizers also do the marketing of the concept. In the early days there were people who were advocating eliminating EDI and others who believed XML was not going to deliver. They had to organize seminars/talks and publish material to support that both XML and EDI can work together. As the early implementations started pouring in (Sterling Commerce with their XML mapper inside their GENTRAN product, and GE Information System), they brought out information on the implementation.

In case of Linux India Group, Nagarjuna and De'Souza from Mumbai, were quite active members, initiated discussions on installation and configuration of FreeOS, especially Tomcat and servelets. As they actively shared their experience and expertise with other members and as accolades for their efforts started coming from well known subject experts such as Atul Chitnis, they found themselves invited to organize special interest meeting. Over time such efforts led them to join the rank of core organizers.

Experts are the storehouses of the community's knowledge. They facilitate tacit knowledge sharing and arbitrate technical directions when the merits of solutions are in dispute. In case of XML/EDI Martin Bryan was the early expert. The early activities were related to development of framework. Beniot Marchal, David Webber, Bruce Peat and Betty Harvey published solutions and offered guidance as the community expanded. Experts online interactions can be either leading type, where he/she is offering an opinion or one based on factual knowledge of related disciplines .

Good Morning everyone,
I have a question regarding schemas.
** Is anyone using them in production with a XSLT style sheet on the back end processes?*
** Can I take the schema and create a subset of the schema, using only the elements I need?*
This will mean that some of the elements will not be included, and this may change some element, sub element structures.
** Will this make my sub set a different schema?*

** Will folks using the schema that is used as my base, be able to process my PO even though some of the element structures are different even though the names are the same??*
The reason I ask this is I'm working with a large schema that is very complex. I'm trying to use an XSLT tool to create a style sheet and I'm having problems with getting the output I want.
Again, any input is welcomed.
Lisa O'Donnell

I do in various forms and shape but, being based in Europe, I work with EDIFACT data. In fact I wrote about that technique in "Applied XML Solutions."
We're have other projects where we convert from in-house file (flat files or CSV) to XML documents, such as invoices.
--ben<
>>>>>>>>>>>>>
Ben,
Correct me if I am wrong - you are talking about using XSLT in combination with custom Java code - the purpose of the Java code being to pre-parse the EDI into XML so that the XSLT can then process the EDI?
The one obvious issue with this is the need to process codelists within the EDI itself - so its not necessarily a simple <tagging> exercise (in X12).
My experience is that XSLT is not designed to handle non-XML source data, and so struggles in this area.
Great book though!
DW.

Subject: Medicare and Medicaid paper claims
In the extension rule, it states that Medicare will no longer be accepting paper claims once HIPAA is implemented. Unless there are special circumstances, or no means, etc. Is this same type of rule going to be applied to the Blue Cross/Blue Shields, or Medicaids?
Thank you,
Keith Noel

This requirement is not part of the Administrative Simplification Compliance Act. Each BCBS or Medicaid agency will be making its own decisions in this regard. I can certainly envision the payers requiring their network providers to submit all claims according to the HIPAA standards as part of their provider contracting.
Rachel Forester

Problem posers are the people who bring technical problems for discussions or opinions of the community. They identify problem (however trivial or personal it may be), and solicit solutions. Two classes of problems are posted on the list, one related to EDI in general and others EDI in particular industry/sector. Examples are shown below.

Would someone be kind enough to attach a sample EDI X12
870 status report transaction?
I would greatly appreciate that. Please email them to:
michaeko@petco.com

I was wondering if anyone is using XML to exchange the Certificate of Analysis?
I'm mostly interested in the Human Food and/or Health industries practises.
Any help would be greatly appreciated.
Thanks
Dominique Dequirez

Implementer are those who attempt the community suggestions, conduct experiments adding validity to the suggestions made. Their role in knowledge management is very critical as they add empirical validity and verification. Following is an example

Integrator organizes existing technical information, codifies rules and builds a taxonomy or manual. She may also bring out a state-of-the-art survey of tools and methodologies. Three types of knowledge domains can be codified and stored: business analysis, design and development knowledge (Kogut and Zander, 1992). Business analysis, similar to information engineering, provides the detailed requirements of specific applications based on an understanding of the business processes. The business knowledge is represented through data and process models. Design Knowledge refers to the specification of an application and captures the specific implementation details of an application. Design knowledge is represented through variety of artifacts such as interface specifications, data flow sheets and action diagrams. Development knowledge ties the design to specific hardware or software application. Communities store development knowledge in the form of executable code, record formats and reusable codes for specific applications.

On Wednesday, March 06, 2002 5:53 AM, Dominique Dequirez wrote:
>
> I was wondering if anyone is using XML to exchange the Certificate of
> Analysis?
>
X12 defines the 848 Material Safety Datasheet, 863 Report of Test
Results and the 864 Text Message - all of which could be used.
Since there isn't a specific one available, I would recommend the
863 Report of Test Results.
You can get XML Schemas, DTDs, sample XML docs, specs and
implementation guides for any of these from http://www.vcml.net.

CIDX (www.cidx.org) also provides a Certificate of Analysis (based upon the same tools/techniques used at http://www.vcml.net).
Hope this helps!
JohnE

Institutionaliser pushes for recognition by regulatory and standard setting bodies. He/she takes responsibility for standardizing the technology framework/architecture, gets certification by other recognized bodies and pushes for regulation.

TO: XML/edi list
DISA's prototype specifications registry, based on the ebXML registry specifications, is now live. See http://www.disa.org/pr_doc.cfm?Name=730 for the full announcement and http://www.disa.org/drive/ for the DRIve site. Please note that the prototype objects, from Open Travel Alliance and Interactive Financial Exchange Forum, two of DISA's industry affiliates, are displayed for test and demonstration purposes only. Also, you can browse around the registry (read-only guest privileges) without any individual or organizational registration.
Comments and suggestions are welcome. Best regards.
Alan Kotok

In case of XML/EDI, involvement with standard bodies such as X12 in the USA, EDIFACT in Europe and other internet bodies was crucial for adoption of XML/EDI group's recommendation. Martin Bryan involvement with European Committee for Standardization (CEN/ISSS) led the standard setting body announcing a major new project during its 5th meeting in Brussels on 11th June 1998 to study and promote the XML for electronic data interchange (EDI). In early 1998, XML/EDI group joined as a special member The Graphic Communications Association Research Institute, Inc (GCARI), an affiliate of Graphic Communications Association (GCA) in Alexandria, Virginia USA. The XML/EDI group, joined with Data Interchange Standards Association (DISA) for management of its business and technical services on 2nd February 2000. Bruce Peat and David Webber were instrumental in institutionalizing these multiple linkages. The group had written guidelines for XML's use in EDI and proposed specifications for repositories of XML/EDI specifications used by industry groups. For example, Betty Harvey had developed the DTD for X12 340 Bill of lading for the shipping industry and also the insurance industry.

Philosopher someone who can pontificate about the standard. They may not be necessarily users of technology but have a vision about the usefulness of it. They are useful to getting the message out.

I believe we have all been waiting for XML implementation tools to cross the lower price threshold and offer genuine proven capabilities at a price that smaller businesses can entertain.

XML Global is proud to deliver a comprehensive toolset that sets a new benchmark for price / performance today. With this pack you can build effective business applications in three modes - Web forms to XML database, Application to XML database, and Transformation integration of XML, EDI and database content.
http://www.xmlglobal.com/downloads/Collateral_XMLIntegrationWorkbench.pdf
We look forward to serving your XML needs,
DW.

Thus individual members through different roles at various stages in the development of the community construct, codify, consolidate and legitimize knowledge. An important point to note here is unlike traditional organizations where roles, behaviors and rewards are formally tied, technology communities are open and the role behavior is rather discretionary. Role behavior in technology communities is therefore akin to Organ (1988) organizational citizenship behavior where individual behavior is discretionary, not directly or explicitly recognized by a formal reward system, but is intended to promote effective functioning of the community.

Conclusions and Implications

The study makes a substantive contribution to our understanding of how roles evolve in technology communities. Studying the knowledge related e-mail messages from two technology communities, we identified six roles. The common theme running through these roles was the members involvement and action leading to some aspect of knowledge management. The roles are expected to be neither exhaustive nor unique to the group in whose work they were identified. The fact that we analyzed two geographically and technologically two different communities suggest that other technology communities similarly employ multiple roles.

What implications do this research study have for practice. The research suggests that a technology communities knowledge management system needs to help individuals objectify their knowledge and the social construction process should enable it through the identified roles. The research indicates the value of codification and classification of knowledge, especially for the new comers. Manuals and FAQ's are extensively used by novices and only when the queries require tacit information will the experts step in. The research also indicates the limitation of anonymity in the knowledge management roles. Experts are recognized and inputs from them are verified through experimentation and validation. Explicit recognition of experts is therefore required to promote acceptance of new ideas.

Table 1. Identified Roles and Knowledge management activities

Role	Knowledge Management activities	Example
Core Organizer	Organize the community, initiate talks and groups formations	We still have spaces available for our exploring XML for E-business seminar, 26-27 June. The Call for papers is open for the OOPSLA '01 Workshop on Objects, XML, and Databases.
Expert	Tacit knowledge, knowledge sharing	A VAN sponsored web solution can support not only your EDI transactions, but also the transactions of other trading partners. The partner sends either X12, EDIFACT or XML based transactions. Having one URL and one interface really helps to improve the learning curve for small vendors.
Problem poser	Brings problems to the platform, poses queries,	We are building an EDI X.12 to XML integration using Biztalk server. Unfortunately BTS does not know how to dial into a van (geisco in our case) and get EDI documents from the customers mail bail nor submit documents to the customer mail box. Has anyone done this?. Do you have recommendations on software we can beg, borrow, buy or steal.
Implementer/ Bug reporter	Establishes empirical validity to the suggestions made, Informs limitations and bugs	We have implemented four X.12 EDI transactions (4100) using BTS. We did not employ orchestration as suggested, had to do some pre-processing, did not go the COM route. We also looked at Datajunction which could not fulfill or needs and also Seeburger (which was expensive).
Integrator	Collate several rules/suggestions, Build taxonomy, build manual	DTD question, see the threads. Your DOCTYPE element has to match root element. Valid code is <!DOCTYPE test SYSTEM "test.dtd" [< !ELEMENT test (#PCDATA/elm1/elm2)* >
Institutionalizer	Push for standardization, regulatory support	Yesterday, the U.S. Senate passed S. 1684 by unanimous consent, delaying implementation of HIPAA transactions and code set standards by 1 year. This is good news for ebXML to establish as the preferred medium to enable compliance.

Appendix 1

XML/EDI and BLUG: background on the Communities

For decades, electronic data interchange (EDI) has been used to communicate commercial documents among organizations. The main factors that have been limiting the acceptance of EDI are entrance cost and Standards. To accelerate the adoption of EDI, an Extensible Markup Language (XML)/EDI framework integrating XML with EDI was proposed in July 1997. This was in response to President Clinton's call for industries' support in dealing with Internet-based commerce issues, and the emergence in time and space of pivotal technologies that allowed this to be realized through the fusion of XML and EDI. The founding members were Martin Bryan, David Webber, Bruce Peat and Ben Marchal. It was an ad hoc group of professionals and volunteers in various industries dedicated to promoting and guiding the future of XML/EDI standards and products. The initial impetus to look at XML came from Scott Nieman via the EDI-L list. David Webber met Bruce Peat in his house in Silver Spring – Maryland, and as a result of that two hours meeting, Bruce Peat put up the first XML/EDI web page and announced it to EDI-L and other list serves. Martin Bryan, was being introduced to EDI by Man-Sze Li (Chair of the CEN workshop), Claude Charimonte (Chair of ISO TC154) and Denis Hill (working for ISO on the Basis Semantic Register). He suggested CEN to use XML for their Simple Electronic Business (SimpleEb) work. Based on a presentation to the Committee of CEN explaining the benefits of XML, he wrote a paper with an example book ordering application to demonstrate the potential. David Webber and Bruce Peat invited him to join the XML-EDI group. The early part of discussions anchored around the XML-EDI framework steered by Martin Bryan, David Webber, Bruce Peat, Bob Crowley and Rik Drummond. Benoit Marchal was the founding listmaster for the XML-EDI group.

In 1998, XML was formally released by the W3C consortium. To take advantages of the extensibility of the XML, the XML/EDI proposed a framework containing three major components: templates, agents and global repositories (Webber, 1998). The Group's technical focus is with the underlying base technology of incorporating XML with E-business to support the numerous vertical markets. Associated with this is a goal to establish standards for commercial electronic data interchange that are open and accessible to all, and that delivers a broad spectrum of capabilities suitable to meet the full breadth of business needs. The work also includes active involvement with existing standard bodies such as X12 in the USA, EDIFACT in Europe and Internet standard bodies.

The major focus of the XML/EDI group are

- To provide a grass roots advocacy open to anyone with an interest in improving Electronic Business for end users, and specifically through the use of XML and EDI together.

- To provide an Internet based set of resources for people involved in XML/EDI, including research and advancement of the technology, through to support for end users in their endeavors to benefit from XML/EDI.
- To promote and develop a set of Guidelines that derives the maximum benefits from the amalgam of XML and EDI, and to promote the adoption of those Guidelines within the traditional standards bodies for Electronic Business and with commercial software developers.
- To provide through focus groups the wide adoption and support of XML/EDI throughout the business world, and to liaise with appropriate industry bodies to facilitate their use of XML/EDI.
- To foster and promote projects and products that implement such Guidelines and to organize research and pilot projects to demonstrate practical business implementations.
- To foster the development of public domain tools and open systems software whenever possible. And thus to provide the means to use XML/EDI to anyone who wishes to, or has a need to use and participate in Electronic Business.
- To provide a conduit for the dissemination of information on XML/EDI to the press and media, and also to facilitate talks, lectures, seminars and workshops on XML/EDI by providing access to qualified speakers, presenters and materials.

Membership is open to individuals or organizations that support the mission and goals of the group. There is no charge for membership, and there are no restrictions on membership other than to support the XML/EDI Group's mission. Membership is focused around participation in the Internet based conferences and E-Mail mail server lists and/or local user groups, and also from simply occasional contributions to group projects, surveys, focus group efforts, and whatever meetings and conferences the group may organize or collaborate in. Madanmohan's association with XML/EDI began in August 1998, when e-commerce was the new kid on the block and he was offering a course in E-commerce and EDI. With about 60 students in the class, XML/EDI was used as the data source on EDI strategy and implementation. The degree of involvement with the community varied from being a problem poser to volunteering to be on research group. According to Adler and Adler (1987) classification of membership roles, the role amongst the users of XML/EDI resembled that of the active-member-researcher in that he interacted closely enough with group members to establish a perspective similar to that of an insider. However, he did not take on any work responsibilities.

Siddesh's association with Linux started in 1996; the Internet was new and fairly an unexplored territory in India at that time. Linux was the OS of choice for most engineering colleges. Siddesh's college had a Class C network and Internet connection through ERNET, but did not have enough funds or the technical expertise to run the network. So the students were called in to develop and manage the college computing network. Soon a Unix-based network with all the main servers running on Linux was established. The Linux movement in India was in its infancy at that time. Bharat Linux Users Group (BLUG) mailing list was hosted on the college's server. Some college

students also frequented Undernet's #linux[3], where linux lovers from the world over used to meet and discuss Linux related issues. This was also a platform to help new users with their problems. Both the mailing list and the chat room are examples of a group of people whose interaction is motivated by a common interest. The collaborative nature of the Linux project meant that virtual interaction would be a part of the Linux world. This happens in various ways, some of which are: Mailing lists, Usenet postings, Internet Relay Chat, Chat rooms and Bulletin Boards. Siddhesh happened to be involved in the system administration and managing the list serve for over 3 years. His role resembled active-member-researcher in that he took on active work responsibilities.

[3] Undernet is one of the world's largest IRC (Internet Relay Chat) sites.

Exhibit 1

Following presents a request for information about a standard and replies from several members.

We are trying to determine if there is a "standard" out there for sending Catalog information via XML. The cXML format is not what we are looking for. Any suggestions would be greatly appreciated
Sherry Falb-Joslin

Sherry,
I believe the Health Industry Business Communications Council's XML Technical Committee has been working on this for the medical products supply chain. Not sure what the status is, but you should be able to get information a HIBCC's web site: www.hibcc.org
Rachel Foerster

Have you tried the WSDL based xCBL 3.5 catalog structure
Babbit, Kelly B

Kelly,
This sounds VERY complicated. Assimulation of multiple
technology layers to get it working.
Is it? Has anyone got it working?
DW.

Ahh the old HIPAA quandary rears it's ugly head.
This is a very specialized area regarding transactions and the intended transport thereof.
While HIPAA is on hold and will certainly not shape your ability to send product data's
via un-encrypted EBXML, HL7. Any potential patient information could fall under sure scrutiny. In any event , I would recommend looking into EBXML based solutions.
Mike

Hi Sherry,
There is HL7 for healthcare in XML. the web site is www.hl7.org
Thanks
Jeffery Eck

Sherry.
Take a look at the approach at http://www.catxml.org
which is designed to be open and extensible and ebXML aware.
Also the OAG BODs : http://www.openapplications.org
work with verbs and nouns for catalogue exchanges.
DW.

Sherry,
I believe the Health Industry Business Communications Council's XML Technical Committee has been working on this for the medical products supply chain. Not sure what the status is, but you should be able to get information a HIBCC's web site: www.hibcc.org
Rachel Foerster

Exhibit 2

The following is an interesting reply of a posting on a Linux mailing list (Original posting is shaded in gray). Note the usage of the word 'Troll' in the subject line – it is a reference to the Microsoft supporter! (language development)

```
Date: [illegible] Nov 199[illegible] 12:26:14 -0[illegible]
From: [illegible]
To: linux-india@grandte[illegible]
Subject: Linux Vs Microsoft Troll

"Bala[illegible] K S" [illegible] wrote:

Footnote moved to the beginning for visibility: I know this is going to generate a
whole wave of rebuttals and angry reactions. Please hold your fire. Read this
posting. If you think I have missed out some points then mail them [illegible] I'll
summarize them and post them here.

I am an ardent fan of Bill Gates and Microsoft...

That's a matter of opinion and India is a free country - everyone is free to have
their own opinion. Linux-India has had many of these Linux Vs Microsoft
discussions. We are not averse to the topic as long as you have carefully
researched, factually accurate data.

Having said that let me point out the inaccuracies in your posting.

I want to make one thing clear...Without Microsoft, there would have been no Unix or
for that matter, No LINUX !

Fact: Unix was written in early 70s in Bell labs. Microsoft was born much later.

I do not find any good reason to ditch Windows OS today. I have not used
LINUX)...Why is there an aversion towards this OS?

Wh[illegible] ditch windows? Use what works best for you, for a given purpose.

Since Unix was not portable, Linux was created...I [illegible]

Fact: Unix was written on DEC PDP-11s, later ported to DEC Vax, [illegible] on Sparc[illegible],
Mips, HP [illegible], Power PC/RS6000s from IBM, apart from PCs. But the tree was forked
[illegible] of the [illegible] source [illegible] from AT&T [illegible]
[illegible] each other.
Linux started [illegible] was ported to all of the [illegible]
[illegible]

Why fight with Microsoft? It is just a company doing its bit to improve the working
conditions of users worlowide...Just becoz Linux is available free, does not mean
that Windows should be available free, is it?

Who said windows should be free?

I am not asking you to change over to Windows (should that be "change back to
Windows"?) but do not criticize the hard work that has gone into creating what is
now known as Windows...Without this concept of Windows, the software industry would
not have grown this big or huge...

[illegible] the Internet [illegible] right.

How many of U there swear that Linux is much better than Windows ?
(This is for users who have used both)...No flame wars please...

[illegible] on what you use your computer for. For what I do with my PC, I swear that
[illegible] better than windows.
```

Compare this with Microsoft...They are not fleecing you like our Indian counterparts...

So, your point is that Microsoft is better than some rogue software companies in India. How is it relevant to Linux ?

The software list available for Windows is great...Can anyone of U give a convincing list of software (or even support) available for Linux ?

http://sunsite.unc.edu/mdw/products.html

Do Oracle, Sybase, Informix, IBM DB2, Wordperfect, Applix Office Suite matter ? How about SAP/R3 ?

My main intention was to learn Linux (since I did not show much interest in Unix earlier in my career) or switch over to Linux through this list, but I feel pathetic to see users of this OS struggling to make their work easier

It's a chicken and egg problem. If more users use it, hardware vendors will make sure that everything works out of the box. Until things work out of the box, more users won't buy it.
Linux is a co-operative effort. You have no right to whine about something not working. If something doesn't work, **you** fix it. If you don't know how to fix it, you ask someone else who knows for help. If no one helps you, you pay money to get it fixed. That's the Linux model.
Microsoft worked hard and achieved their current market share. There is no point denying them credit for this. But if they use that muscle to keep others from selling their software - that is illegal in the country in which they operate. That's being investigated in a court of law and out of the scope of this list.

Maybe Linux is for serious programmers (the hardcore ones!) and not for users like me who use their comps for both knowledge and entertainment... Sorry, if this is the case, I should not be here in the list...

What's the point ? You hung out on the list for a while and found people asking for help, inferred that Linux sucks and now you're throwing a whole bunch of mud on Linux before running away ?

I joined the list only because I wanted to upgrade myself (not from Windows to Linux) technologically, but I do not find any reason to do this at this juncture...

How do you know Linux is not technologically superior? In order to find out, you should learn something about the technology.
And if you have any doubts about which is the best OS as of today to learn more about computers, I challenge you to present your arguments here.

Bottom line:

> 4. Linux is fundamentally a hacker OS, written by programmers for programmers.

2. Certain commercial companies are trying to change this and bring it to an end user. They're not feature by feature competitive with Windows yet - but offer certain other advantages - like security, customizability, stability and computer literacy apart from price.
3. Most copies of Windows in India are pirated.
4. If you don't like the Linux model, don't use it. Using it doesn't cost you anything. It also means that you don't have a right to whine about it - because you didn't pay for it.

-Arun

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