Group where?
Virtual organizations and knowledge sharing

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Table of Contents

1. Introduction

2. Virtual organizations
   Popularity
   Significant features of a virtual organization

3. Knowledge
   Sharing knowledge in organizations
   Conversion processes

4. The Use of tools and technologies

5. Organizational culture

6. Considerations
   Trust
   Individual perceptions
   Language and culture
   Managerial responsibilities

7. IOSN: a case study

8. Conclusions

9. References

Figures and tables

I. Nonaka & Takeuchi’s “Four modes of knowledge conversion” incorporating Choo’s elaborations.

II. Davenport & Prusak’s “Common frictions and ways overcoming them.”
1. **Introduction**

Virtual organizations are the stuff of dreams. Work arrangements where workers are “encouraged to work at home or at a customer site” (Davenport & Prusak, 2000, p. 91) without the cloud of authority hanging over one’s shoulder, is a highly attractive prospect. The disadvantage to this, however, is that dispersion of co-workers allows little room and opportunity for knowledge exchange, especially that of informal knowledge. Without social interaction, there is less opportunity, and therefore, less frequency for the sharing of this knowledge, which already poses a challenge to traditional organizations in its creation, exchange and storage. The virtual worker also has little opportunity to participate in the shared workplace culture that provides context for understanding among workplace colleagues as well as those across cultural boundaries.

Why then are virtual organizations so prolific and how does the exchange of knowledge take place within them in order to drive them successfully towards their objectives? This paper looks at what virtual organizations constitute, and the challenges posed by the need for knowledge sharing within their communities, as well as the nature of knowledge, and tools and methodologies used in its exchange. A case study on an existing virtual organization is also cited to further illustrate the author’s points.

2. **Virtual organizations**

The ability to interact asynchronously across distance effectively by way of telecommunication and technological platforms has given rise to the *virtual organization*. Introduced formally as a term in 1986 by Mowshowitz, it may also be known as a *virtual company*, *virtual enterprise*, *virtual factory*, or *virtual office*. (Malhotra, 2001, p. 21)

Essentially, the ‘virtual organization’ is a network of partnerships, which could comprise either or both intra- and inter-organizational perspectives. Examples of organizations, business companies and government organizations that have established virtual organizations to complement their work include Aventis (pharmaceuticals), Dell (computers), British Telecom (telecommunications systems), Reuters (news services) and government agencies in the United States such as the US Department of Defense, Department of Agriculture, and the Social Security Administration (Pang, 2001). International organizations such as the United Nations have also established networked partnerships in order to collaborate across geographical and timeline boundaries.

**Popularity**

According to Jackson (1999), the popularity of virtual organizations has risen due to three main reasons:
1. The demand for more work flexibility. New and cost-effective technological capabilities make working remotely more viable and attractive for individuals.

2. The need of organizations for systems to improve knowledge management. Knowledge management systems will help organizations to improve innovation and learning, using technology that helps members “acquire, accumulate, exchange and exploit organizational knowledge.”

3. The rising popularity and spread of access to and transfer of knowledge and expertise across organizational and spatial boundaries, internal networks and geographically dispersed groups and individuals.

According to statistics found on the website of the International Association of Virtual Organizations, 1997 saw approximately eight million people working full-time from home, telecommuting or working remotely. About half were business owners. (IAVO\(^1\), 1999) While these figures may be somewhat dated at this time, we can see that there was already a trend towards working virtually from the late 1990s. One example of the effective use of virtual organizations in 2005 is reflected in the United States’ e-commerce retail industry. According to the US Census Bureau, retail e-commerce sales up to the 3\(^{rd}\) quarter of 2005 amounted to USD22.3 billion out of the USD 957.9 billion value of the total US retail sales of the same year. The e-commerce sales reflected an increase of 5.7 percent from the 2\(^{nd}\) quarter of the same year. (US Census Bureau, 1999/2000) More details are featured at the US Census Bureau website\(^2\).

**Significant features of a virtual organization**

Warner and Witzel (2004) list several traits that generally characterize a virtual organization:

*Lack of physical structure.* In general, virtual organizations have fewer tangible assets and are more geographically dispersed. Every organization, however, requires space of some kind. While traditional organizations have walls and tangible boundaries, virtual organizations substitute bricks and mortar with communication technologies, creating, in fact, a “virtual space.” The lack of physical structure allows virtual organizations to be reconfigured quickly, and allows room for externalizing other functions such as, e.g. certain areas of administration. The problems with this lack of structure and geographic dispersion, however, include motivation (which may stem from perceiving flexibility as instability), control and accountability, and the over-simplification of virtual systems to accommodate what is perceived to be the lowest level of employee capability. (ibid, p. 21)

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Reliance on information and communications technologies. Technology is the tool that enables facilitation of the organization’s work but is not the organization itself. While technology links together the network of the virtual organization, there are always issues of technological upgrades, obsolescence, incompatibility among operating systems, and so forth. It is also important to remember that technologies need to be balanced across the board, e.g. a business may have adequate communications technology to handle customers, but unless it also has corresponding resources for storage of information, tracking systems, delivery services, administrative systems, etc., working effectively as a whole will be fraught with difficulties. (ibid, p. 36)

Ability to work in a mobile dynamic manner. Work is carried out via telecommunications networks instead of within physical company office structures. This makes physical location less important as organizational members may assemble on the network from different parts of the world, and at different times of day. However, the location of a physical structure and the presence of colleagues may indirectly be factors for motivation for some, and lacking those, such employees become unproductive. Another point for consideration is effective coordination and the accountability of all employee activities that correspond to and complement each other, and if there is an efficient technological tool (and an equally efficient human coordinator) to keep track of work as it is being carried out.

Ability to take hybrid forms. Virtual organizations are more collaborative partnerships in work than traditional hierarchical office structures. They are referred to as “collaborative agencies, the integration of core competencies, resources and customer market opportunities.” (Goldman et. al 1995:202, ibid, p. 4) Some examples of virtual organizations are geographically dispersed virtual organizations, virtual value chains (e.g. linking suppliers, producers, distributors, retailers, etc.), e-commerce entities, learning and hypertext organizations, virtual communities, virtual webs and hologram organizations.

Lack of boundaries and inclusive nature. Together with its hybrid nature, virtual organizations overlap with other organizations and parties; for example, the virtual value chain that encompasses suppliers, distributors and customers, and links them together in order to improve goods and services through information exchange.

http://www.espen.com/papers/orgbrain.htm
Flexibility. Theoretically, virtual organizations, like a set of building blocks, can come together at short notice, work to achieve certain goals, and then disperse again. They can be restructured differently and redeployed to address changing strategy needs. In that way, virtual organizations are able to respond to specific audiences in a customized manner. Like the ability to work in a mobile dynamic manner, the flexibility of virtual organizations may encounter challenges in terms of motivation, coordination, accountability and individual responsibility.

It should be noted, however, that there is a grey area spanning virtual organizations from physically tangible ones. Virtual organizations are not generally ends in themselves, but “strategic options” (ibid, p. 5) that are viable only with proper analysis of organizational needs and the perception that “going virtual” will fulfill those needs.

Many ‘real’ companies have virtual arms such as online stores where buyers and sellers interact, libraries that have online catalogues and research features that are limited to registered members who work using those facilities, software developers who may work in physical offices but gather online to collaborate on projects. The boundaries of the virtual organization grow fuzzy depending on who or what its affiliates are.

From a managerial point of view, Hoefling (2001) states that working virtually has been exponentially driven, among others, by:

**Savings on cost of physical space**
With the rising cost of real estate, the collocation of less-expensive places and workers’ homes as workplaces allows for a vast increase in savings. Whether or not going virtual is suitable for an established organization or one “born digital” requires research into other factors such as the maintenance and upgrading of software; depreciation, obsolescence and replacement of hardware, and the cost of network and communications systems. Non-technological costs may include staff training in the use of network technologies, and employment or retention of reliable staff able to work independently as well as the loss of tacit and cultural knowledge normally exchanged through traditional workplace interaction.

**Productivity gains**
To answer the perpetual question as to whether employees are working on company time, companies reported productivity increases as typically 15 to 48 percent in a virtual work environment. The reason for this is that workers are empowered to work in
environments conducive to their work styles and activities and as such, are able to perform at higher levels than in a traditional office setting.

Recruitment and retention
The flexibility afforded by virtual organizations increases the quality of life, and balances work and personal time. Without the necessity of a long commute or physical relocation due to family commitments, valuable workers are generally more inclined to stay with an organization.

According to Mowshowitz (1997, p. 36) the structural position of a virtually organized task should “be wherever it can best be executed.” What has chiefly made this possible is computer technology, expanding networked communities that allow people to work collaboratively across geographical and time-related boundaries.

3. Knowledge
Unlike data and information, knowledge involves the added value of beliefs and commitment; leads to action; and is context-specific and relational (Nonaka and Takeuchi, 1995). Organizational knowledge itself is generally distinguished into two types: explicit and tacit; with explicit comprising “knowing that” and tacit, “knowing how” (Kikoski and Kikoski, 2004, p. 65). Explicit knowledge is defined as “knowledge that has been codified formally using a system of symbols and can therefore be easily communicated or diffused.” (Choo, 2002) Explicit knowledge may be object-based or rule-based. Tacit knowledge, on the other hand, is “the implicit knowledge used by organizational members to perform their work and make sense of their worlds. Tacit knowledge is hard to verbalize because it is expressed through action-based skills and cannot be reduced to rules and recipes.” (ibid)

A third distinction is posited by Choo as cultural knowledge that consists of “the shared assumptions and beliefs about an organization’s goals, capabilities, customers and competitors.” These beliefs dictate the value and significance of information within an organization. All three types of knowledge are interdependent, and the more integrated they are, “the more unique the organizational advantage.”

Sharing knowledge in organizations
The transfer of knowledge within organizations has constantly been compelled to confront barriers such as ignorance, the lack of absorptive capacity, the lack of trust, and often, the lack of motivation (O’Dell et al, 1998). These already exist in traditional organizations where physical and social interaction is an everyday part of working life. One may conclude that the very nature of the
virtual organization with its components of dispersion, asynchronous communication, lack of physical structure, and constantly re-grouping of team members poses a particularly interesting challenge towards bridging those boundaries and allowing the flow (or even the occasional spurt) of knowledge sharing.

In terms of knowledge types, words such as “difficult” and “hard” are constantly associated with the capture of knowledge, especially tacit knowledge. The inclusion of cultural knowledge within the realm of tacit knowledge in this context is logical. Explicit knowledge aside, both tacit and cultural knowledge are personal, context-specific and therefore, hard to formalize and communicate (Nonaka and Takeuchi, 1995). Prusak (1999) adds that the value of tacit (and therefore, cultural inclusive) has risen dramatically since the inception of electronic information storage due to its scarcity (i.e. not easily copied and therefore, not widely accessible), and its role in being organized and selected from the vast amount of information available, and subsequently tailored for use.

Indeed, there have been naysayers on the whole notion of this being possible. Blecker & Neumann (Malhotra, 2000, p. 70) state that: “since the exchange of tacit knowledge already encounters substantial barriers within a single organization, its interchange within a network is widely considered as being impossible.” The authors cite, among others, significant differences in corporate culture, competition among partners, missing rules of cooperation and inadequate coordination as factors that also restrict the inter-organizational use of knowledge.

The success of virtual organizations is highly dependent on cooperation in knowledge sharing and collaboration in its use. However, Blecker and Neumann state that only explicit knowledge can be transferred and used in virtual organizations.” Knowledge conversion from the tacit and cultural to the explicit, therefore, appears necessary.

**Conversion Processes**

As illustrated in Figure I, the fourfold conversion methodology in creating and acquiring knowledge developed by Nonaka and Takeuchi (1995) lists the four processes of knowledge conversion as socialization, externalization, combination and internalization.

Socialization is where tacit knowledge is exchanged and expanded; or as succinctly explained by Choo (2000): “Watching it, then doing it.”

Externalization converts tacit knowledge into explicit knowledge. “Doing it, then describing it.” (ibid).
Combination brings together different types of explicit knowledge and combines them into new knowledge. “Finding it, then combining it.” (ibid).

Internalization happens whereby explicit knowledge is internalized by its users and in effect, becomes tacit knowledge. “Hearing it, then believing it.” (ibid).

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<thead>
<tr>
<th>Tacit knowledge</th>
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<th>Explicit knowledge</th>
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<td>Tacit knowledge</td>
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<td>Internalization</td>
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<td>Combination</td>
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<td>“Hearing it, then believing it.”</td>
<td>“Finding it, then combining it.”</td>
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Figure 1: Nonaka & Takeuchi’s Four modes of knowledge conversion (incorporating Choo’s elaborations.)

This methodology takes into account both tacit and explicit knowledge, their creation, and acquisition. Awareness of these four processes and their application in appropriate combinations can inspire organizations, both virtual and traditional with better ideas on generating and sharing information.

4. The Use of tools and technologies

The understanding of what constitutes knowledge, and how it must be processed and converted for sharing among a community, brings to question the tools and technologies that are used to facilitate these processes.

Enamored as we may be with technologies as magic wands bringing to life the pathways of knowledge exchange in a virtual organization, they do not create knowledge itself. Neither do they generally enhance the process of using knowledge as they cannot dictate how the knowledge itself is used. (Davenport and Prusak, 2000) They are tools that store and distribute knowledge comprising human concepts created by human brains. They are the wands, not the wizards; the enablers, not the cause; the medium, not the message.

*Messaging systems such as Instant Messaging* (IM). In a study by Nardi and Whittaker (2000), IM tools allow the negotiation of availability to initiate conversations on a virtual plane and serve not only as a means of communication, but ease the media-switching
process when considered appropriate between parties. IM also allows more than two participants in a single conversation if required, thereby providing not only a platform for dialogue, but for group conferencing as well. In their findings, the authors comment that it is “interesting that a lightweight technology consisting of no more than typing text in a window succeeds in providing enough context to make a variety of social exchanges vivid, pleasurable, capable of conveying humor and emotional nuance.” (ibid, p. 82) The use of IM allowed the creation of an environment “similar to a shared physical office, where people engaged in work related tasks, interspersing sporadic interchanges throughout their individual work.” (ibid, p. 84)

While IM may be considered part of groupware, it is unique in its flexibility to accommodate both synchronous and asynchronous communication, to expand from a two-person conversation into a group conference, and provide both a formal and informal setting for the exchange of tacit, explicit and cultural knowledge.

**Groupware.** Defined as “software that enables teams of people to work together efficiently” (Chaffey, 1998, p.2), groupware supports computer supported cooperative work (CSCW) providing functions including:

- **Communication tools** such as email, faxing, voice mail and Web publishing;
- **Conferencing tools** such as data-, voice- and video-conferencing; online discussion boards, blogs[^4] and chat facilities (such as IRC[^5]);
- **Collaborative management tools** such as electronic calendars and schedules (such as PeopleCube[^6]), project management systems, social software (social networks, online dating services, etc.). One example of this is the Internet/WWW shared workspace (Appelt, 2001; Bentley et al.,1997) such as the Basic Support for Cooperative Work (BSCW) Shared Workspace System that provides a controlled virtual platform for collaborative work through discussion forums, search functions within the BSCW, document format conversion, version management, multiple language support and event services. Control and coordination of this workspace content is through authentication and a specific access rights model.

**Workflow management systems (WFMS).** Workflow can be defined as “the computerized facilitation or automation of a business process in whole or part.” (Chaffey, op.cit, p.73)

[^4]: http://sentra.ischool.utexas.edu/~i385q/blog/
[^5]: http://www.irchelp.org/irchelp/new2irc.html
[^6]: http://www.meetingmaker.com/home.cfm
Examples of WFMS are the tracking systems used by United Parcel Service (UPS\textsuperscript{7}), Amazon.com\textsuperscript{8}, and online shoe store, Zappos.com\textsuperscript{9}. Workflow systems assist virtual organizations through ongoing tasks such as automatically assigning tasks, monitoring and measuring performance, and populating records information. The effectiveness of this tool, however, appears to lie largely in its mechanical ability and less so in making judgment calls. For example, performance measurement may be perceived by a WFMS through the number of posts on a blog, but the system itself cannot decide on the quality of the post or the extent to which it may be of value to the blog community as a whole.

\textit{Intranets and extranets}. An intranet is “a network of networks contained within an enterprise and protected from outside intrusion through firewalls. Intranets permit the sharing of company information and computing resources among managers and employees” (Pang, 2001) while an extranet extends this network to include external parties and stakeholders deemed suitable by the organization. Some examples of intranet applications are organizational protocol, internal organizational news, documents and employee information, schedules, and databases. Extranets include applications such as collaborative platforms, information sharing and project management functionality.

Other tools and technologies include wireless technologies, personal and mobile devices, virtual reality (such as immersive experience, desktop systems, mirror worlds, and telepresence technologies), and web portals to access knowledge content. (ibid.)

5. Organizational Culture

Another major factor that influences knowledge sharing to a large extent within a virtual organization, but often seldom perceived is the role of organizational culture and its attitude towards knowledge in the organization.

If a virtual organization is an arm of a traditional organization, it very often reflects the culture of its parent, e.g. the product return policies stated on US department store chain Target website are also applicable in-store. If born directly into the virtual realm, it may reflect the traits of its creators and generally evolve over time, depending on its active participating members.

Virtual organizations require strong organizational support culture for knowledge creation and exchange in order to achieve its purposes. Choo’s premise (2002) that an organization’s cultural

\textsuperscript{7} http://www.ups.com/WebTracking/track?loc=en_US
\textsuperscript{8} http://www.amazon.com
\textsuperscript{9} http://www.zappos.com
knowledge includes “beliefs that are used to assign value and significance to new information” therefore indirectly dictate the trajectory of the organization’s path. O’Dell et al. (op.cit., p. 24) advocates “a strong professional ethic and pride supported by well-honed skills in teaming, including cross-functional teams” and warns that without such a culture, “it must expend efforts to create such a culture, or risk failure.” Coakes et al. (2002, p.197) also advocate the need for support within an organizational culture by using case studies that “emphasize the need for the culture for knowledge sharing to predominate in the organization, and that a suitable physical environment is provided such as in Halogen’s ‘inspiring’ locations.” While the provision of a physical “inspiring” location may not always be available within a virtual organization, a virtual “social area” that encourages informal relaxed conversation (e.g. chat rooms, IM), allowing members to approach one another without the mantle of work may also provide the setting.

6. Considerations

In an organizational setting, the “greater good” appears to be the ultimate goal. Nonaka and Takeuchi (op.cit., p. 43) use Drucker’s suggestion of “organizational self-transformation” to illustrate the need for knowledge sharing within the organization. Organizational knowledge is required to constantly shed its obsolete components and create anew through

- Continuing improvement of every activity
- Development of new applications from its own successes; and
- Continuous innovation as an organized process

Davenport and Prusak (op.cit., p. 97) suggest several “frictions” that are obstacles to the transfer of knowledge as well as some solutions.

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<thead>
<tr>
<th>Friction</th>
<th>Possible Solutions</th>
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<tbody>
<tr>
<td>Lack of trust</td>
<td>Build relationships and trust through face-to-face meetings</td>
</tr>
<tr>
<td>Different cultures, vocabularies, frames of reference</td>
<td>Create common ground through education, discussion, publications, teaming, job rotation</td>
</tr>
<tr>
<td>Lack of time and meeting places; narrow idea of productive work</td>
<td>Establish times and places for knowledge transfers: fairs, talk rooms, conference reports</td>
</tr>
<tr>
<td>Status and rewards go to knowledge owners</td>
<td>Evaluate performance and provide incentives based on sharing</td>
</tr>
<tr>
<td>Lack of absorptive capacity in recipients</td>
<td>Educate employees for flexibility; provide time for learning; hire for openness to ideas</td>
</tr>
<tr>
<td>Belief that knowledge is prerogative of particular groups, not-invented-here syndrome</td>
<td>Encourage nonhierarchical approach to knowledge; quality of ideas more important that status of source</td>
</tr>
<tr>
<td>Intolerance for mistakes or need for help</td>
<td>Accept and reward creative errors and collaboration; no loss of status from not knowing everything</td>
</tr>
</tbody>
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Figure II: Common Frictions and ways of overcoming them.
Trust
A pivotal component in the glue that holds groups together is trust among its members. The virtual organization may seem doomed to fail with its perceived lack of social interaction and shared experience, geographic dispersion, and amorphous tangible structure. Jarvenpaa and Leidner (1998) cite Cummings and Bromiley (1996, p. 303) in factors that help establish trust, wherein the group:

- Makes a good-faith effort to behave in accordance with any commitments both explicit or implicit;
- Is honest in whatever negotiations preceded such commitments;
- Does not take excessive advantage of another even when the opportunity is available.

Jarvenpaa and Leidner also state other factors that facilitate the development of trust include shared social norms and repeated interactions, and especially “the anticipation of future association.” Interaction appears to be key in building relationships and subsequently trust, depending on group members, and while it appears that computer-based communication does little to convey interpersonal sentiments such as warmth, comradeship and affection, the authors cite empirical studies that indicate “computer-mediated communication does not differ from face-to-face communication in terms of the capability of social information exchange, but rather in terms of a slower rate of transfer.” Indeed, it appears social dialogue, depth and intimacy were found to be greater in virtual groups than face-to-face groups, despite geographic dispersion and cultural diversity. (ibid.)

Individual perception
It is too often repeated: “knowledge is power”. Indeed, the perception has become so engrained today that there is the tendency to horde knowledge because of the perceived power or advantage it gives the bearer. These include some of the points indicated by Davenport and Prusak in Figure II i.e. narrow idea of productive work, status and rewards go to knowledge owners, lack of absorptive capacity in recipients, and intolerance for mistakes or need for help.

Neumann (Malhotra, op.cit, p. 71) also mentions some of the perspectives seen by the individual in the perceived loss of power through sharing knowledge. These include anger at losing one’s position of advantage, desire for personal power, single orientation on competition, living in the past, conservatism, emotional and motivational aspects, limited capacity of observation, processing and learning.
The culture of individualism, lack of the feeling of “belonging” and team spirit as well as the inability to see the “bigger picture” contributes to this perspective. Organizational measures to mitigate the situation may be taken, but these take time, and may not even result in desirable outcomes, especially if those to be “remedied” are resistant.

What may bring individuals together and to some extent, supersede the level of individual perceptions depends highly upon the goals of the virtual organization be they for profit or not. E-commerce such as e-Bay\(^ {10}\) and Orbitz\(^ {11}\) is highly virtual but eminently successful; academic collaboration such as the Leverhulme Trust\(^ {12}\) continues to breed ideas through online cooperative work; and online groups such as the International Open Source Network\(^ {13}\) and Idealist.org\(^ {14}\) that work towards causes for the public good.

Language and culture
Davenport and Prusak point out that an important factor in knowledge sharing is “the common language of the participants.” (2000, p. 98). Here, “common language” spans not only multi-ethnic and different organizational cultures, and international boundaries, but also technical jargon and an understanding of the language used in different areas and levels of a particular profession. They also mention that successful knowledge transfer sometimes works only if the parties involved have face-to-face contact, as in the Boston tunnel project (p. 99), and suggest that some solutions are events that create a common platform for members through education, discussion, publications, teamwork and job rotation.

Managerial Responsibilities
For knowledge creation and sharing to take place, it is imperative that management not only understand the concept of knowledge and its role within the organization, but also the difficulties caused by distance in physical location and temporality. Björkägren and Rapp (Jackson, 1999, p. 171) state that it is important to "create conditions for knowledge interactions within the organization, i.e. to create arenas for knowledge meetings…" Problems such as lack of time and meeting places can be mitigated with the use of “social meeting areas” such as Coakes’ (2002) “inspiring” locations previously mentioned.

Management also plays an important role in evangelizing the policy that knowledge is the prerogative of all members of the organization and not of “particular groups”. Perceived preferential treatment can do much to cause division among colleagues and exacerbate the

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\(^{10}\) http://www.ebay.com  
\(^{11}\) http://www.orbitz.com  
\(^{12}\) http://www.leverhulme.org.uk/grants_awards/grants/international_networks/  
\(^{13}\) http://www.ioasn.net  
\(^{14}\) http://www.ideal.org/bbs/cgi-bin/wwwthreads.pl?sid=39562621-181-ePMkw
prickly issues of trust and individual perceptions, while undoing the seams of understanding that may already serve to bond those of different language and culture.

7. **IOSN: A Case Study**
The International Open Source Network (IOSN) is an initiative of the Asia-Pacific Development Information Programme (APDIP) under the United Nations’ Development Programme (UNDP). IOSN was established in 2003 with objectives among which seek to foster a deeper understanding of the benefits, policy implications and resources available to governments, organizations and individuals through the use of Free/Open Source Software (FOSS) in the Asia-Pacific region. Administration is coordinated between secretariats in Malaysia and India. (Loh, 2005).

IOSN works primarily through its portal at http://www.iosn.net, using an online network comprising members interested in FOSS-related information, tools, resources and discussions. Members range from non-governmental organizations to educational institutions, government agencies and policy-makers to FOSS advocates and users dispersed across a geographical area from Mongolia to New Zealand, Afghanistan to Fiji.

Postnuke was the initial content management system selected but was supplanted by Plone which was found to be more suitable for IOSN’s purposes in terms of user and content management, and its versatility in handling different content types ranging from simple HTML pages, documents and news items to more complex ones such as forums, blogs, and wikis. Plone uses Dublin Core for standardized searching, allowing the IOSN community the use of all content sharing keywords and related metadata, and supporting Open Archives initiative standards if needed. IOSN itself uses W3C accessibility standards and guidelines, and uses GNU FDL and Creative Commons for licensing purposes.

IOSN’s strength as a virtual organization, however, lies not only in its selection of an appropriate technological tool to draw members of its community together. While administration and coordination is run by the secretariats, responsibility and accountability within the community is enhanced by participatory content management of the website. Members are initially contributors who add and submit but not publish content. The ability to publish lies initially with the secretariats, but is also delegated to those who are interested enough to be responsible for certain sections (such as by country, topic or project theme) of the website and apply to the secretariats to do so.
Existing community channels such as newsforge.com and osdir.com are also utilized for outreach purposes. By submitting information through these, IOSN items are also publicized by dissemination via different sites as well as community members, e.g. links to related topics or items on sites with heavy user traffic such as Wikipedia that carries the IOSN Localization primer.

IOSN also holds an annual FOSS Asia-Pacific seminar to foster social interaction and provide a face-to-face forum for its community members and other interested parties to discuss all things FOSS. The popularity of its first participants’ mailing list in 2004 became so overwhelming that it was extended to including general IOSN members and members of the IOSN Policy Development and Implications international policy discussion forum. Activities and events such as Software Freedom Day, workshops, meetings and conferences also help bring the IOSN community closer together. These are highly effective in both establishing and enhancing the trust and personal relationship factors required to make virtual organizations (indeed, any organization) work successfully. Moreover, individual perceptions governed by fear, status concerns and intolerance may also be mitigated by these instances of personal contact. Furthermore, IOSN’s regional portal has initiated the organization of local FOSS activities by community groups whose members participate on online IOSN-hosted forums, enhancing local social interaction and knowledge exchange.

One might argue that IOSN is not a solely virtual organization since its members meet once a year under the IOSN umbrella, and intermittently at global conferences and meetings on FOSS and related issues. It is, however, an excellent example of a virtual organization that has taken stock of its experience, made changes that it deemed suitable through observation, feedback, research and discussion, and is making progress towards achieving its ultimate objectives. It also has plans to reorganize itself to better accommodate the continuous addition of content and the flow of heavy traffic that rides the IOSN website, the extension of multi-language use, and even the possibility of a new presentation template to better highlight the latest news and events.

8. Conclusions

To quote Davenport and Prusak (op.cit, p. 141), “technology alone won’t make you a knowledge-creating company.” The idea of technology as the silent invisible arm that works all levers and makes everything possible is a myth, and even more so in the realm of the virtual organization.

The virtual organization is highly feasible in its flexibility and relative cost-saving characteristics, and has proven thus far as commercially viable and communicatively effective. However, it faces challenges in its knowledge sharing efforts mainly concerning issues of trust among organizational members who have little or no social interaction with each other; and high
dependence on a technological medium that may not convey tacit and cultural knowledge that is exchanged on an everyday basis due to physical proximity and interaction in a traditional organization. In general, challenges that face the sharing of knowledge in a virtual organization are similar to those faced by traditional organizations but more so in the areas where social and personal interaction is required to build trust, personal relationships and cultural understanding.

Technology itself opens up pathways that allow communication and knowledge sharing within a virtual organization but it does not create the knowledge that constitutes the content to be shared, nor does it judge or dictate how that knowledge is used.

It appears that while a virtual organization on its own may prove successful in achieving its goals and bringing its members together, a virtual organization that also brings the members of its community together in person from time to time encourages deeper and more valuable knowledge exchange. This personal interaction also helps alleviate the challenges concerning issues of trust, individual perception, language and cultural understanding and crosses organizational boundaries. Thus, the notion of a virtual organization that includes some elements of a traditional organization may prove to achieve a higher level of knowledge exchange than one that is purely virtual.
9. References

Books


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