Governance and global communities

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No one is as smart as all of us

Japanese proverb

Abstract

Communities are a new form of organization in which volunteers, primarily, contribute to the creation of economic value. Building upon transaction cost economics, communities are investigated as a fourth form of governance structure. The concept of transaction benefits is introduced to the governance structure equation, and some key variables (individual characteristics and needs, information technology, and national culture and policy) influencing transaction benefits are identified. Within communities, four major forms (restrictive, diffusive, inventive, and adaptive) are identified based upon dimensions of responsiveness and transaction benefits. We conclude with a discussion of the relationship between communities and other governance structures.

Introduction

New administrative structures reflect changes in the economy, and the current design of organizations is influenced by the state of administrative art (1962). One of the more interesting recent organizational designs is the open source movement, in which communities of globally dispersed and talented information technologists cooperate to create software that is less expensive (often free) and competitive with software produced by conventional means. One open source product, Apache, has the major share of the market. SourceForge, the largest repository of open source, hosts nearly 70,000 projects and has nearly 700,000 registered users. However, we know little about how communities, such as the open source movement, operate. Their success does not fit accepted economic behavior theory, as they do not rely on markets or hierarchies to organize production (Benkler 2002). Economists have offered rational explanations for
this behavior (e.g., Lerner and Tirole 2001), but human behavior is a mix of rationally and socially determined actions (Simon 1957). From a social perspective, organizational behavior is affected by the structures within which people operate and by the intrinsic and extrinsic rewards they derive from participating within these structures. In this article, we present some conceptual models for investigating the structures of communities.

A **community** is an organizational form for economic value creation that is characterized by voluntary membership, high autonomy, and whose members receive little or no extrinsic rewards. Communities are open to all, and with the spread of the Internet, they are becoming more common among the array of international organizations. As long as a person has Internet access and a certain level of education, they can participate in a community. This new form of international organization has tremendous potential to influence economic development, education, and knowledge transfer. Community projects might be particularly appealing to some countries and national cultures. For example, the Brazilian federal government has opted for open source software because of its lower cost and opportunity to stimulate local software skills (Karp 2003).

Besides its growth as a mode of international organization, the community is a potentially superior method to hierarchies and markets for the identification and allocation of creativity (Benkler 2002; Roberts 2003). Creative individuals are free to add their ideas and skills to the communal production (Fielding 1999). Those communities that can recruit members from a wide range of cultures and countries might be particularly well positioned for creative growth because they can tap a diverse set of values, perspectives, and knowledge. Because they will have more sensors in the global environment they should also be more able to sense and react to change. In a post-industrial society, where knowledge and creativity are the foundation of economic well being, it is imperative that we learn more about communities and investigate the circumstances under which they thrive. There might be opportunities to transfer some of these findings to
traditional organizational forms or encourage them to change their governance structure.

This work starts by examining transaction cost economics, a well-accepted theory for explaining organizational form. After reviewing several communities, the work examines task characteristics, extends current transaction cost economics to include transaction benefits, and presents a taxonomy of communities.

**Transaction cost economics**

Transaction cost economics (TCE) asserts that the transaction is the basic unit of economic activity, where a transaction cost is a cost incurred in making an economic exchange.¹ Transaction costs are those over and beyond the price of the product or service procured. They broadly break down into motivation and coordination costs (Milgrom and Roberts 1992). Opportunism (Williamson 1985) and agency costs (Jensen and Meckling 1976) are components of motivation costs. Coordination costs include search (Stigler 1961), input coordination (Armen and Demsetz 1972), and measurement costs (Barzel 1982).

TCE maintains that firms and markets are alternative approaches to organizing economic activity (Arrow 1974) and that firms need to align governance structure and transaction characteristics (Williamson 1985; Silverman, Nickerson, and Freeman 1997). Transactions costs depend on the how the transaction is organized. Hierarchies bear the costs of managing and monitoring personnel and purchasing inputs. Market-based costs include source selection, contract management, and performance monitoring. TCE also recognizes the network as a third governance structure. The strong personal ties among the participants distinguish networks. We can capture these causal linkages graphically (see Figure 1).

TCE has been extended to include the open source movement by adding a fourth form to the existing governance structures of markets, hierarchies, and network (Demil and Lecocq 2003). Based on the dimensions of intensity of incentives and control, the four forms are exhaustive (see Figure 2). In line with Raymond (2001), Demil and Lecocq (2003) label this new governance structure bazaar, while others call it peer production (Benkler 2002). However, as we will show in the next section, the open source movement is not the first occurrence of this fourth form of governance. We believe the term community describes more accurately a form of governance that has existed longer than the open source movement. In addition, we show that the open source project is one form of community. The appellation community, we believe, captures the notion of an organized body of people voluntarily working collectively to achieve a common goal.

**Figure 2: Governance structures**

<table>
<thead>
<tr>
<th>Intensity of incentives</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Hierarchy</td>
<td>Network</td>
</tr>
<tr>
<td>Low</td>
<td>Community</td>
<td>Market</td>
</tr>
</tbody>
</table>

**Examples of communities**

While much attention has been given to the open source movement, international communal production is not necessarily a recent phenomenon. By examining some other community projects, we can gain some general insights into the nature of this governance structure.
The Oxford English Dictionary

A precursor of the open source movement is the Oxford English Dictionary (OED). In 1857, the Philological Society of London decided to create a new dictionary that would record the history of each word. The OED was an international project from almost its birth. The first call for contributors was posted in 1859 to American scholars.² However, not much happened for nearly two decades until 1879, when the editor issued “an appeal to the English-speaking and English-reading public to read books and make extracts for the Philological Society’s New English Dictionary.”³ The appeal called for volunteers to read certain publications, make word lists, and look specifically for certain words in which the dictionary’s team was interested. Volunteers were required to submit a slip of paper identifying where they found a particular word and a sentence illustrating its use. The first editor estimated he would receive 60-100,000 slips of paper. He received six million slips from tens of thousands of volunteers (Winchester 1998).

The OED request for volunteers was preceded by nearly four decades by a redesign of the private correspondence network. The penny post, introduced in 1840, dramatically reduced the cost of sending letters.⁴ It is doubtful that volunteers would have been willing to send so many slips if the personal cost had been prohibitive.

The OED project had some key characteristics.

- It was an information processing task;
- Reading many books became massively parallel because of the number of volunteers recruited;

² http://www.oed.com/archive/marsh/p1.html
⁴ One example quotes a reduction from 7d to 1d for a distance of 45 miles, http://imagesoftheworld.org/stamps/ph3.htm.
• A low cost communication network enabled many volunteers, who were willing to bear some of the costs, to participate;

• A centralized coterie of editors managed the process;

• The process by which definitions were identified and submitted could not be closely supervised so attention was paid to the quality of the submission;

• The vast majority participants received no financial reward or recognition. Their rewards were intrinsic.

**Project Gutenberg**

In 1971, Michael Hart decided that famous and important books no longer under copyright should be made publicly available in electronic format. More than 10,000 books have been converted. Books are scanned and proofread in what is arguably the largest group literary project since the OED (Moynihan 2002). While electronic scanning is relatively fast for converting an image to electronic text, it is error prone, and thus time-consuming proofreading is required to detect and report mistakes. In 2000, distributed proofreading was introduced. Volunteers who elect to proofread a page of a particular book are shown on a single Web page, the page’s image and the corresponding text conversion. The edited text is submitted and then checked by a second proofreader. When a book has been completely proofread, the pages are assembled and the book released. Volunteers were processing about 6,500 pages per day in November 2003 (Gutenberg 2002).

Some of the interesting features of Project Gutenberg are:

• Proofreading is a massively distributed parallel process;

• Proofreaders receive no financial reward.

• A small group manages the process.

• A low cost communication network, the Internet, enables work to be globally distributed and volunteers absorbed some of the costs of participating.
**Academic journals**

Scientific societies first appeared in the 16th and 17th centuries in Naples, Rome, London, and Paris. Charles II chartered the Royal Society in London in 1662. Scientific societies facilitated academic communications through their journals, such as the *Philosophical Transactions* of the Royal Society, beginning in 1665, and the *Memoires* of the Paris Academy, beginning in 1699.

The intellectual work of reputable academic journals is almost always handled by academics. The editor, editorial board, and reviewers are usually scholars or highly experienced practitioners. Most receive no payment for their work. As most readers are likely to be familiar with the academic journals, we do not dwell on the procedures, but rather summarize the key features.

- Work is distributed, initially via the postal system and now via the Internet, which means editors and reviewers can be located anywhere. As a result academic societies have become more inclusive (Watson 1994).

- The editors and reviewers gain some extrinsic rewards, though these may be delayed. Tenure and promotion committees tend to view editorial roles as indicators of prominence. Reviewers enhance their research skills and knowledge by writing reviews.

- For each journal, a few people (e.g., the editor and senior editors) manage the process.

- The institutions employing the editors and reviewers bear some of the costs.

- Editors rely on output controls (i.e., the quality of the review) rather than process controls.

- Those who participate in the production of academic journals are often also consumers.

**Open source software**

While programmers have shared software from the early beginnings of programming, the foundation of the open source movement was the decision of Richard Stallman in 1985 to create the Free Software Foundation and GNU General Public License (GPL). The movement contained considerable
momentum in 1991 when Linus Torvalds released on the Internet the core source code for Linux (Demin and Lecocq 2003). There are now thousands of projects and some open source efforts command considerable market share. The open source movement has the following features.

• Work is globally distributed via the Internet.
• Most participants receive few financial rewards, but there are opportunities for them to gain a reputation and increase their skills.
• Those who contribute code to a project might also use the resulting product.

Wikipedia

Wikipedia\(^5\) is a multilingual (more than 20 languages) free online encyclopedia established in January 2001. The English version now contains nearly 180,000 articles. Wikipedia is an open collaborative effort written and edited by its readers. Any entry can be edited by anyone. If we examine the entry for “transaction cost,” we see that the original entry was made on Nov 8 2002 and there have six amendments since then. Thus, no one person is associated with the authorship of an entry, and, furthermore, there is no editor-in-chief. Any reader can also participate in a discussion of a page’s content and request new topics. There are similar projects\(^6\) aimed at providing information via an open collaborative framework. Wikipedia has several interesting traits.

• Anyone with an Internet connection can participate.
• Participants gain few intrinsic (e.g., authorship can be shared by many) and no extrinsic rewards.
• Those who contribute to Wikipedia can also use it.
• Wikipedia is highly adaptive because control lies with the readers and contributors.

A common characteristic of the communities discussed is their focus on a particular task: publish a dictionary, convert books into electronic format, publish an academic journal, write a piece of software, and so forth. They have an overriding task with which many can identify.

**Transaction and tasks**

While economists built TCE around the notion of a transaction, we believe that there is sufficient overlap between the notion of a transaction and a task to apply the task literature to the investigation of governance structure. Both transaction and task have multiple definitions. According to OED (2nd edition), a transaction is “the carrying on or completion of an action or course of action,” and a task is “Any piece of work that has to be done.” We believe that these definitions capture the usage of the respective literatures and also illustrate the commonality of their meaning.

We now examine further the nature of the tasks undertaken by communities from two perspectives: the nature of the task and task interdependency.

**Task circumplex**

The group task circumplex (McGrath 1984) captures the main categories of group tasks (see Figure 3). Clearly, the community model, because of its highly distributed nature, is not well suited to tasks in the execute and negotiate quadrants. Decision-making tasks are also problematic in large communities where sharing opinions and eliciting preferences is difficult. Large distributed groups might have some success in generating ideas, but this does not seem to be very common in current communities.

Inspection of the circumplex and consideration of the prior cases, suggests that intellective tasks are most amenable to community performance. An *intellective task* is one that has generally agreed upon guidelines for its solution, and resolution is driven by facts and objective analysis (Kaplan and Miller 1987). An appropriately skilled person should be able to readily judge the quality of the
solution. The vast majority of tasks in the communities studied are intellective. In particular, communities appear suited to solving intellective tasks where a high degree of parallelism can be applied by dividing a task into small tasks.

**Figure 3:** McGrath's (1984) task circumplex

**Task interdependence**

The nature of the major work in each case can also be describe as pooled interdependence (Thompson 1967), because each task is essentially independent and the final product is a result of pooling the work of multiple individuals. A central authority coordinates activity by assigning work (e.g., academic journals) or letting participants self-select their tasks (e.g., open source). There are standards to ensure the required output is delivered (e.g., the OED’s slips,
reviewing guidelines, and definition of a program or modules purpose) and completed task are compatible (e.g., all software is in the same language or written for the same operating system).

The highly distributed nature of the participants makes them unsuited for undertaking *sequential interdependent* or *reciprocal interdependent* tasks. With sequential interdependence, each task depends on the successful completion of prior tasks (Thompson 1967). Coordination is often achieved by pacing production via an assembly line (for physical products) and workflow systems (for soft products), which are often found in hierarchies, but not in organizations in which participation is voluntary and often unscheduled or unschedulable. Reciprocal interdependence describes task that must interact synchronously and coordination is mainly through implicit or explicit negotiation (Thompson 1967). The parties typically need to have shared values and goals in order to reach quick agreement, and such tasks are not in the province of the cases we have described. Many such tasks require face-to-face interaction, such as in markets or group meetings.

A review of two major and well-known task categorization schemes indicates that most community members are performing intellective tasks under pooled interdependence. This is not to say that other task types are not being undertaken, but most participants are relatively autonomous solvers of problems with correct answers. Community leaders would, we expect, undertake planning and decision making tasks, for example, and their work might well be reciprocally interdependent. Nevertheless, it is the dominant task or transaction that dictates the nature of the governance structure.

**Transaction benefits**

The focus of TCE is on transactions costs, but transactions also have benefits. In a manner analogous to transaction costs, we define *transaction benefits* as the benefits incurred in making an economic exchange. Transaction benefits are above and beyond those benefits of direct financial return. Thus, a person
employed by a firm gets direct benefits of a salary, health insurance and so forth. The same person might gain transaction benefits of reputation, collegiality, intellectual challenge, skill development, and enhanced self-esteem. In the case of a community, the transaction benefits are all that most participants gain. Thus, we believe that the TCE model needs to be extended, particularly to account for communities, by including transaction benefits (see Figure 4).

![Figure 4: Transaction Governance Fit](image)

Consider the case of an entrepreneur entering the software business by hiring programmers, whom he puts to work writing code. The entrepreneur encounters all the traditional transaction costs (e.g., selecting employees, monitoring their performance) and major direct costs of paying the programmers. Thus, it is not surprising that the governance structure is a hierarchy with high control mechanisms to motivate employees and coordinate their work.
Another entrepreneur might take the approach of recruiting volunteers to work on writing the same software. In this case, the transaction costs are much lower, but not zero (Demil and Lecocq 2003), and the entrepreneur has few direct costs. However, in order to accomplish the project’s goals, the entrepreneur must find a way of creating transaction benefits in order to motivate the programmers because they receive no direct financial benefits. In this, we postulate that transaction benefits determine governance structure.

**P1:** When transaction costs are relatively low, transaction benefits will determine governance structure.

Transaction benefits are non-monetary and thus much influenced by the social dimension of humans. Thus, we would expect a person’s characteristics and needs to influence the benefits that person derives from a transaction. Thus we propose:

**P2:** Individual characteristics and needs will determine the transaction benefits an individual derives from participation in a community project.

We also conjecture that national culture will have an influence on transaction benefits. Studies in the variation of values across cultures suggest that they vary on the dimensions of individualism, power distance, uncertainty avoidance, the distribution of jobs and opportunities, long-term orientation (Hofstede 1991), chronism, and context (Hall 1976). Given the considerable research illustrating how national culture influences group behavior (Tan et al. 1998), it is reasonable to propose that national culture will impact transaction benefits. Furthermore, when some nations (e.g., Brazil) adopt a considerably pro open source policy, we can expect their decisions to have an impact on transaction benefits (e.g., a feeling of well-being from contributing to national goals). When community projects are inherently global and open to all, we need to understand how national culture and policy influences transaction benefits.

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7 Masculinity is Hofstede’s original term.
Before proceeding to examine the role of technology on governance structure, we need to distinguish between information system and information technology. In our mind, information technology transmits, processes, or stores information. Whereas, an information system is an integrated and cooperating set of software directed information technologies supporting organizational goals. The distinction is important because information technology has a different effect, in the case of governance structure, than information systems.

Information systems can change transaction costs. For example, Enterprise Resource Planning (ERP), accounting systems, and Interorganizational Systems (IOS) are designed to reduced coordination costs within and between organizations. New communication networking technologies (e.g., the Internet) usually provide significant reductions in coordination costs and thus increase the reach and richness of the interactions that an information system can provide (Evans and Wurster 2000). Information systems, in the form of electronic markets, can lower search costs (Bakos 1997), because it is faster and less expensive for the parties to compare prices. Because information systems can change transaction costs, they potentially influence the governance structure. Some researchers conjecture that the shift to the electronic transactions will foster a shift from hierarchies to markets (Malone, Yates, and Benjamin 1987), while others suggest a “move the middle” (Clemons, Reddi, and Row 1999). In this work, for completeness, we recognize the impact of information systems on governance structure, but we do not intend to elaborate further on a body of literature that already addresses this issue.

Information technologies are a commodity because there are no restrictions on who can buy computers, software, and network access. Information technology knowledge, in contrast, tends to be a scarce resource. Skills are often in short supply for the newer technologies that can offer significant efficiency and effectiveness gains. Thus, there is a strong incentive to learn high demand information technologies and demonstrate competency in them. Participants will
be attracted by projects that enable them to gain high demand skills and document achievement of these. An open source project based on new technology (e.g., XML and Java) is likely to be far more attractive than one founded on yesterday’s technology (e.g., COBOL). Thus, we propose

*P4: The information technology used by a community will affect transaction benefits.*

**Forms of global communities**

Communities come in a variety of forms, as the preceding cases illustrate. We can gain some further insight into these variations by analyzing the key characteristics of each type. As a starting point, we review a model explaining diversity in global firms. This model, suggested by Bartlett and Ghoshal (1987), proposes four strategies emerging from the combination of two criteria regarding (1) the need to be responsive (i.e., to accommodate different local preferences), and (2) the need to reduce costs (i.e., to benefit from economies of scale and standardization). Depending on the importance of each criterion a firm wants to emphasize to achieve greater effectiveness, it should choose one of these four strategies:

- **A global strategy** is relevant when an organization faces great pressures to reduce costs, but low pressures to be responsive. Typically, global organizations locate their headquarters in one country (thus centralized), while operations are performed in one or more other countries. *Efficiency* is the key criterion of effectiveness sought by the global organization.

- **A multinational strategy** makes sense when an organization needs to deal with important pressures to be responsive, but has low pressures to reduce its costs. Under such a strategy, regional operations are relatively autonomous (thus decentralized). Here, the key competitive issue is *responsiveness* to local markets.

- **An international strategy** is called for when an organization does not
face particularly high pressures for being responsive or reducing its costs. Organizations adopting an international strategy try to create value by transferring skills and products to foreign markets where indigenous employees lack those skills and the market is missing the products. Accordingly, effectiveness lies in an enterprise’s ability to transfer knowledge to overseas units, and thus learning constitutes its key issue.

- The fourth strategy, **transnational**, pertains to organizations that seek to address pressures to be more responsive and to reduce costs. This strategy is the most challenging of the four, as these two types of pressures represent competing demands and thus, are difficult to tackle at the same time (i.e., being responsive to a particular market generally involves greater costs). Organizing transnationally necessitates that each organizational activity be performed in the location where it can be best accomplished. In this case, the key to success is to simultaneously meet the challenges of global efficiency, local responsiveness and learning.

A two-dimensional matrix can represent the four types of strategies (see Figure 5). The vertical dimension represents the pressures to reduce costs whereas the horizontal dimension refers to the pressures to be responsiveness.

<table>
<thead>
<tr>
<th>Costs</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Global</td>
<td>Transnational</td>
</tr>
<tr>
<td>Low</td>
<td>International</td>
<td>Multinational</td>
</tr>
</tbody>
</table>

**Figure 5: Potential strategies for hierarchies**

The corporate strategies identified by Bartlett and Ghoshal (1987) relate to one governance structure, the hierarchy. If we conduct a similar analysis for the
community governance structure, we can also identify four strategies (see Figure 6). In this case, the horizontal dimensions is responsiveness, as per the Bartlett and Ghoshal (1987) model. Communities must also be responsive to their consumers’ needs, or their *raison d’être* is likely to be questionable and participation is likely to decline.

The second dimension is transaction benefits. A hierarchy seeks to gain efficiency, including reducing transaction costs, across its variety of operating units. A hierarchy needs to generate a financial surplus to continue. A community, in contrast, is reliant for its continuity on the transaction benefits that members derive. If members’ transaction benefits are too low, then members will drop out and new recruits will not be forthcoming. Thus, a community is interested in ensuring that transaction benefits motivate members to contribute and attract new talent. As the prior cases indicate, these benefits can range from low to high. Accordingly, based on the importance of each criterion a community wants to emphasize, it will settle on one of four types.

<table>
<thead>
<tr>
<th>Transaction benefits</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High</td>
<td>Diffusive</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Restrictive</td>
</tr>
</tbody>
</table>

*Figure 6: Typology of communities*

- **Restrictive** communities focus on producing and maintaining one product, which thus indicates low responsiveness, and the majority of participants receive few transaction benefits. The *OED* is a good example of a restrictive community project. The *OED* is interested in the creation of a dictionary in the English language only, and its contributors receive no recognition other than the personal satisfaction resulting in taking part in such a collective product.

- **Diffusive** communities focus on the diffusion of knowledge to one specific audience while endorsing transaction benefits through this distribution. The production of academic journals is an exemplar of such
a community. Journals are diffusive in two ways. First, the journal is a medium for disseminating information to the community, and second it is a way of developing skills within the community (e.g., reviewers learn through writing reviews and authors learn from the reviews). The contributors to journals (e.g., authors, editors, and reviewers) gain high transaction benefits because their work is often recognized, helps them to learn their discipline, advances their career, or builds their reputation. The responsiveness is low, as journals are targeted to a specific readership sharing the same language.

- An **adaptive** community is one where the work of a restrictive community is replicated in another setting. The operations of an adaptive community are relatively autonomous and transaction benefits are low, but responsiveness is high. For example, a French Wikipedia has the same look and feel as the English version, but other than sharing the base software it is quite independent. An entry developed for one the French Wikipedia will not necessarily be used for an entry in the Turkish edition. Thus an adaptive community is responsiveness to local markets because the core community technology is shared across relatively autonomous groups.

- **Inventive** describes those communities where transaction benefits and local responsiveness are high. The community is efficient, because there is a broad based market for ideas and the egalitarian nature of the community means innovative products will stand or fall on their merit (Roberts 2003). In an open source project, programmers can adapt the code to local conditions, and thus the community is responsive to varying environments. Furthermore, participants can learn from each other, because they can see the architecture of the system and the code for any modules. Because learning often occurs by modeling the behavior of others (Bandura 1977), open source movements are an effective way of transferring software skills globally. Of course, the more the community learns, the more resources it has to enhance creatively its product. An inventive community, because of its members’ self-
selection, high social equality, and global diversity, is designed for learning and change.

**Discussion and conclusion**

Communities were few and far between until the advent of the Internet. In recent years their presence and impact have become more noticeable. While individual communities do not yet approach the size of markets or firms (see Table 1), they can be quite sizable. It might also be the case, as we suspect, that there is a relationship between governance structure and size.

**Table 1: Governance structure size**

<table>
<thead>
<tr>
<th>Governance structure</th>
<th>Entity</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>New York Stock Exchange</td>
<td>83,400,000 U.S. investors&lt;sup&gt;8&lt;/sup&gt;</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Wal-Mart</td>
<td>1,044,000 U.S. employees&lt;sup&gt;9&lt;/sup&gt;</td>
</tr>
<tr>
<td>Community</td>
<td>Linux</td>
<td>&gt;50,000 Linux developers and ~18 million users&lt;sup&gt;10&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Whereas earlier communities were simpler in their governance, opting for restrictive (e.g., OED) or diffusive strategies (e.g., journals), new communities can take advantage of powerful communication technologies (such as the Internet) to increase their level of responsiveness. As a result, the adaptive (e.g., Wikipedia) and inventive (e.g., open source software) are more recent community paradigms. Because they are high on responsiveness and transaction benefits, relative to the other three models, we believe inventive communities are likely to be the dominant form. The application of evolution theory to organizations (e.g., Hannan and Freeman 1977), supports the contention that the form that is most able to extract energy from its environment (i.e., the relatively high transaction benefits) and more responsive will dominate its ecological niche.

<sup>9</sup> [http://www.walmartstores.com](http://www.walmartstores.com)
The open source model has much wider application than the development and distribution of software (Benkler 2002). Likewise, we argue that the four types of communities are likely to become alternative forms of global organizing for an array of domains. Already, communities have been tried in many different areas. In biology, researchers use an open community to sequence bacteria and yeast (Goetz 2003). In engineering, a distributed team (ThinkCycle\textsuperscript{11}) is reported to have designed an easy to use intravenous saline drip that costs about $1.25 to manufacture, instead of the alternative cost of about $2,000 (Goetz 2003). In law, two Harvard University Law School professors started the Open Law Project, relying on volunteer lawyers and law students posting opinions and research to the project’s Web site to help develop arguments and briefs challenging the United States Copyright Extension Act (Torvalds and Diamond 2001). In investment, a new type of open source investing was developed to educate investors pooling their stock market information (Schmerken 2000). In our classrooms, we plan to use Wikipedia technology to involve students in the initiation of an open community for the creation of an XML textbook. Finally, NASA seeks volunteers to help it identify Martian craters (Goetz 2003).

Given the emergence of the community as a new form of organizing, it is time for scholars and practitioners to gain greater insights into communities. In particular, we believe that it is important to investigate issues that can have a profound impact on the effectiveness and efficiency of communities. Thus, we have instigated a program of research to examine governance mechanisms, leadership style, and management tools within communities, with a principal focus on adaptive and inventive communities.

**Hybrid communities**

The distinction between hierarchy and market is sometimes ambiguous: so-called market transactions may take on many firm characteristics, while firm arrangements may have market overtones (Hennart 1993). Because most

\_eft\textsuperscript{11} http://www.thinkcycle.com/
transactions cannot be categorized as either “pure market” or “pure hierarchy” (Stinchcombe 1990; Powell 1987; Adler 2001), it is reasonable to assume that a “pure community” will be unusual. Already, traditional, hierarchies have shown interest in communities, and companies are acting as patrons, coordinators, and mediators of open-source communities; IBM, Apple, Red Hat, VA Linux Systems, Oracle, Corel, SGI, Intel, and Ericsson have taken various initiatives that support the growth of open source communities (Feller and Fitzgerald 2000; Moody 2001). Firms and communities can contribute to each other in a variety of ways (Markus, Manville, and Agres 2000). Thus, the community model will be found intermixed with other governance structures to create hybrid business models (Feller and Fitzgerald 2000).

The existence of hybrids and relationships between communities and other governance structures means that we now have a new range of interactions to understand. However, other than Sharma et al. (2002), who explored how organizations foster an environment similar to open source to manage their software development efforts, very little research has been conducted to understand hybrid modes of governances. Adler (2001) proposes to recognize and study such hybrid institutional forms, and to look at the impact of mediating variable, such as trust, when knowledge-intensive activities are to be coordinated. In this paper, we advocate that individual characteristics, information technology, and national culture and policy will play key roles in community performance because of their impact on transaction benefits.

Any governance structure can potentially interact with the three other governance structures (Figure 7) as well as interacting with governance structures within its class (e.g., a hierarchy with a hierarchy). As a result, there are ten different types of interactions between the various governance forms (e.g., community and network) and with the introduction of communities, there are four new transactions (a community with another community and a community with a hierarchy, network, or market) that have received scant attention in the literature. Furthermore, there is also a need to understand how interaction is
contingent on the form of community. For example, a study of the *OED* should reveal some insights about the interaction between a hierarchy and a restrictive community.

![Diagram showing interactions between governance structures](image)

**Figure 7: Potential interactions between governance structures**

**Transaction benefits**

In this paper, we introduce the concept of transaction benefits as they help to make sense of the governance structure decision when communities exist. Future work is required to flesh out the elements of transaction benefits, and we are reminded that the work on the components of transaction costs is spread over decades, from Stigler’s (1961) work on search costs to Barzel’s (1982) on measurement costs. As a first step, our future plans are to conduct field research on several adaptive and inventive communities to gain a firmer understanding of the dimensions of transactions benefits. One fundamental criticism leveled against transaction costs theory is that, whereas it can explain market failure, it cannot explain why firms succeed (Demsetz 1988). Thus, there is a need to study both failures and successes in community projects.

Initial analysis suggests that communities are well-suited for handling pooled interdependent intellective tasks, but these are not the only types of tasks that a governance structure, no matter its taxonomic class, must handle. Communities
face, at some point, most of the tasks in McGrath’s (1984) circumplex and have to deal with tasks of the varying types of interdependency identified by Thompson (1967). We know little about how these other types of tasks are managed. In particular, we know little about how global factors, such as national culture and values, influence performance of tasks critical to long-term survivability (e.g., decision-making and cognitive conflict) of a distributed endeavor.

The Internet has been a major force in the recent surge in globalization (Friedman 2000) and it has spawned considerable changes in the form of traditional governance structures. New organizations, such as Amazon (hierarchy) and eBay (market) have changed the business landscape considerably. In addition, the community, a new governance structure, is increasingly influencing consumer and competitive behavior. There is a growing generation of consumers (e.g., the new Brazilian government) who think open source products offer many advantages over those created by hierarchies. As a result, major players in the information technology arena, such as Microsoft and IBM, are developing strategies to adjust their competitive stance, in different ways, to handle the presence of communities. Scholars must also make some adjustments. They need to incorporate communities into theories of global business. They need to develop theories that explain a community’s governance mechanism, leadership style, management practices, and other issues that have a significant impact on the success of a community.

As we noted in the Japanese proverb at the beginning of this article, “no one is a smart as all of us.” It is about time some of us become smart enough to develop theories of communities. This work is, we believe, a step in that direction.

References


