Ethical Issues in Collaborative Innovation Networks

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Abstract

Collaborative Innovation Networks (COIN) have gained prominence in recent years as a new kind of knowledge-centric organizational form. This paper analyzes the inner workings of COIN, and the ethical and social underpinnings of their success. The lessons learned apply not only to the Internet, the Web, Linux, and other Open Source software projects, but have also been utilized successfully at many companies.

1. COllaborative Innovation Networks (COIN) – a New Organizational Form

The early twenty-first century brings the emergence of more flexible organizational forms such as communities of interest, communities of practice, and Collaborative Innovation Networks (COIN). COIN are self-organizing groups of highly motivated individuals working together towards a common goal not because of orders from their superiors, but because the members of a COIN share the same goal and are convinced of their common cause. This paper explains how virtual communities of practice enabled by the Web become COIN, teams of highly inspired people that assemble around a new idea, usually outside of organizational boundaries and across conventional hierarchies. The lessons learned apply not only to the Internet, the Web, Linux [Moon & Sproull, 2000] and other Open Source software projects [Raymond, 1999] but have also been applied successfully by companies such as Intel [Chesbrough, 2003], IBM [Hamel, 2001], Union Bank of Switzerland and organizations such as the United Nations [Gloor & Uhlmann, 1999] [Gloor, 2000], leading to innovative new products, or making existing processes more flexible, efficient and agile.

People in COIN work together as a virtual team, to realize a shared goal and make their shared vision come true. COIN have been active well before the advent of the Internet. But by providing instantaneous global accessibility, the Internet has given them an immense boost in productivity. The Internet itself, the World Wide Web, and Linux are examples of innovations driven by COIN. The group of people that started the Web delivers a primary example of a successful COIN, which, originating at a physics research lab, spread like wildfire around the world in just a few months, carried by a diverse group of students, physics researchers, and computer scientists. People joined the Web COIN not for immediate monetary reward, but because they were deeply convinced of the value of the innovation, and wanted to make it happen. Their motivation to sign up was to be part of something new and revolutionary.

This paper first analyzes the inner workings of COIN. It then explores the requirements for an ethical code. Afterwards it analyzes how the existence of an ethical code is crucial to building distributed trust. The paper concludes by proposing the principles for an ethical code for COIN.

2. Inner Workings of COIN

COIN Definition

A Collaborative Innovation Network (COIN) *is a group of self-motivated people with a collective vision, enabled by the web to collaborate in achieving a common goal by sharing ideas, information and work.*

It takes a series of innovators who are ahead of their time to prepare the groundwork for the COIN. Their ideas are then picked up by COIN leaders excelling in collaborative skills to carry the innovation over the tipping point by assembling a team of dedicated experts. COIN combine 6 types of networks: work, social, knowledge, strategy, learning and innovation networks. The main "glue" that holds the network together is the shared vision and a bond of mutual trust.

Initially the activities of a COIN are invisible to the hosting organization. Subsequently the hosting organization is slow to recognize the value of the innovation of the COIN. COIN results are only brought to the attention of top management through external recognition. Once the results of a COIN are fully recognized, the COIN has reached the end of its useful live. It usually transforms itself into other organizational structures.

COIN support an organizational form with five important characteristics: dispersed membership, interdependent membership, no simple chain of command, a work product commons, and dependence on trust. Each of these characteristics creates requirements for an ethical code.

Dispersed Membership: Communication technologies enable COIN with members located over a wide geographical area, often throughout the world. This dispersion increases the difficulty of maintaining productive relationships. The COIN membership must share a larger vision that focuses the members on working together rather than who wins and who loses. Each member must feel a sense of ownership in the COIN undertaking and a conviction that the COIN operates legitimately. Norms must be developed among the members because its members are likely to bring diverse norms when first joining the COIN.

Interdependent Membership: Another fundamental characteristic of a COIN is the interdependence of its membership. Each participant's welfare can be affected by the actions of others. No member can achieve its objectives without the cooperation of others. Furthermore, each member cannot foresee how much benefit they will contribute to other members and how much benefit other members will contribute to them.

No Simple Chain of Command: COIN technology also enables communications from any member to any other member, undermining a simple chain of command. Violations of the COIN norms and the negative consequences of those violations have to be obvious to each member so that cheating does not go undetected or appear harmless. Each member must feel able to express concerns about the COIN or its conduct. Conflicts have to be resolved without a dominating authoritarian force.

Work Contributed to a Commons: Essential to a COIN is creation of a work product commons. Members share work product freely. Members donate work product to this commons. Members build work product based on what is in this commons. The more work product accumulates in the COIN commons, the more costly it will be for a member to

abandon their membership, and thus the greater each member's motivation to comply with the COIN norms and resolve conflicts amicably.

Dependence on Trust: [Fukyama, 1996] defines trust as "the expectation that arises within a community of regular, honest, and cooperative behavior, based on commonly shared norms, on the part of other members of that community." The other term that Fukyama uses in the same context is "spontaneous sociability," which is the ability to form new associations and to cooperate within the terms of reference they establish. If people who work together trust one another because they are all operating according to a common set of ethical norms, their spontaneous sociability will be much higher. COIN can operate efficiently only if there is mutual trust. Trust can only be maintained if there is a mutually agreed on code of ethics.

3. Virtualization of Trust

Meeting face-to-face is still the fastest way to build trust. For large and globally distributed teams this is very expensive, as this means to physically transport people to a conference room. Once a working trust-based relationship between two people has been established by meeting face-to-face, collaborating over long distance becomes much more efficient. Frequently, instead of bringing together all the members of a globally distributed team, it can be sufficient to bring together the leaders of each location. A second area where face-to-face meetings are most efficient is to resolve problems that have come up while working together.

Trust can be built even if a global team cannot get together physically. If all parties involved deliver obviously high quality work, trust is built without meetings. But this process takes far more time than an initial face-to-face meeting, as team members have to let their work literally speak for themselves. Also, if the team members come from different cultures it can be hard to define a common language. For example, in the software industry programmers from India, China, or the Philippines work together with project leaders in the US or Western Europe [Pyysiäinen, Paasivaara & Lassenius, 2003]. Different attitudes towards issues such as praise and rewards, work schedule and quality, and loyalty within family, can raise serious roadblocks towards building distributed trust. Other obstacles to building trust arise if both sides are not given enough information about the project, the tasks to be done, how the work and responsibilities are divided between sites and what kind of quality is expected. Under those circumstances, lack of communication will lead to mistrust. In order to prevail over initial obstacles and to overcome prejudices, chat can be useful, as it allows asking questions and getting immediate feedback.

In homogeneous groups such as software developers, the recognition of familiar characteristics in each other's work will lead them to form a collaborative bond based on skills and similarity of goals [Meyerson, Weick & Kramer, 1996]. This works well for example for the IETF (Internet Engineering Task Force) working groups and the group of programmers developing Linux. But even here, meeting face to face is a much faster way to establish trust.

Initially, new members of a COIN will have a predetermined trust level based on familiarity, reputation, and quality of available information, external recognition, and immediate rewards available to them. Once new members have joined a COIN, they will develop and grow their level of trust based on integrity and competence of the other COIN members they interact with, the quality of information access and communication flow, the intensity of the community building process, and the external perception und support of the COIN.

4. COIN Rely on Hubs of Trust in Small World Scale-free Networks

When one of the co-authors (Gloor) was building a virtual management consulting practice, he discovered how people delegate trust. He assembled a virtual pan-European team of national practitioners called the e.Xperts, working out of consulting offices in major European cities. The e.Xperts were an entirely virtual organization, every e.Xpert remained also a member of the national consulting practice. In each country and practice area an e-champion was selected who acted as the point of contact and leader of the local group of e.Xperts.

The e.Xperts operated a virtual network of distributed trust. In cases where they did not yet know somebody, they would rely on the judgment of people they trusted. And this reliance on other people's friends not just worked locally, but extended into a pan-European network of hubs of trust. Within the e.Xpert network, e-champions became the hubs of trust. The e-champions were the leaders of the various subcommunities such as the national e.Xpert group in each country. Similarly, there was an e-champion for each industry and practice area such as e-Business consulting for financial institutions, or the practice group of Java developers. The twenty-four e-champions of the different countries, industries and practice areas knew and trusted each other well. They had become acquainted through regular pan-European e-champion meetings. Frequently, as senior members of the consulting organization, they had previously worked together in consulting assignments. The e-champions formed a pan-European network of trust, which they were able to extend to other members of their organizations. This meant, for example, that an e-champion in Lisbon might act as a reference for one of the e.Xperts in his team, delivering a fair assessment of his skills to a project leader in Norway who would inquire through the national e-champion in Oslo about the capabilities of the e.Xpert in Lisbon. The e-champion network of trust was similarly effective in recruiting new e.Xperts, staffing projects with e.Xperts, and identifying the right people that might have personal relations to a potential client or business partner. The project leader in Norway was placing trust into the e.Xpert in Lisbon through two intermediate hubs of trust. He was using his personal network of trust, extending it to the e-champion in Oslo, whom he knew, on to the e-champion on Lisbon, whom the e-champion in Oslo trusted, to the e.Xpert consultant in Lisbon.

This e-champion network of trust allowed for extremely efficient operation at very low cost. Without the e-champions, the project leader in Norway would have had to place his request with the European central staffing manager in London, who would then have used his skill database and contacts with line managers to identify suitable candidates. The project leader would then have done multiple interviews to find the best candidate, leading to substantial communication and travel overhead.

The network of trusted hubs operates far more efficiently. Thanks to a small world [Watts, 1999] and scale-free [Barabasi, 2002] structure, it offers an extremely scalable and robust way of efficient virtual collaboration. Figure 1 illustrates the "small world" property of the network. If John wants to reach Mary in circular organization A, he has to pass by two intermediaries, i.e. his path length to Mary is 3, and his degree of separation from Mary is 3. With a small world structure such as in organization B that allows for direct connections between any two members of the organization, the degree of separation is one.

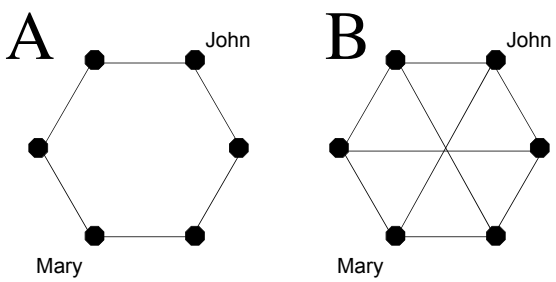

Figure 1 Small World structure (B)

Figure 2 illustrates how the small world structure can be amended to also become scale-free. Network C displays a scale-free network with John and Mary acting as hubs. Bill, Fred, and Sue can only access the network through John and Mary. This network is robust and works fine as long as only peripheral people such as Bill, Fred, and Sue are added or removed. The network breaks, though, if one of the hubs such as John or Mary leaves.

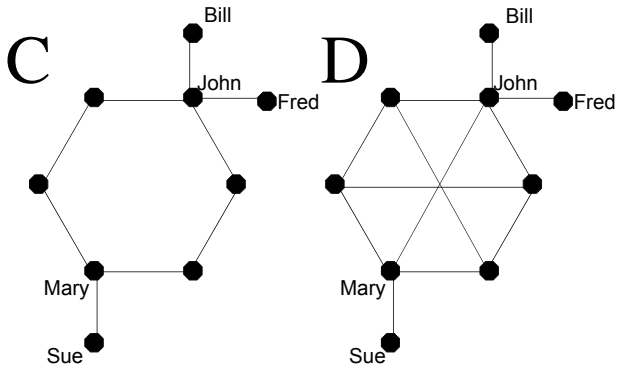

Figure 2. Small world scale-free network with hubs of trust (D)

The scale-free network C in figure 2 becomes even more robust and efficient if it is made a small world in D by adding direct connections between non-connected hubs. The connectivity between hubs John and Mary is now guaranteed, even if one of the other hubs in the circular path between John and Mary leaves. This means that a network of trust is ideally structured as a scale-free small world network, with the hubs of trust acting as cornerstones of the network.

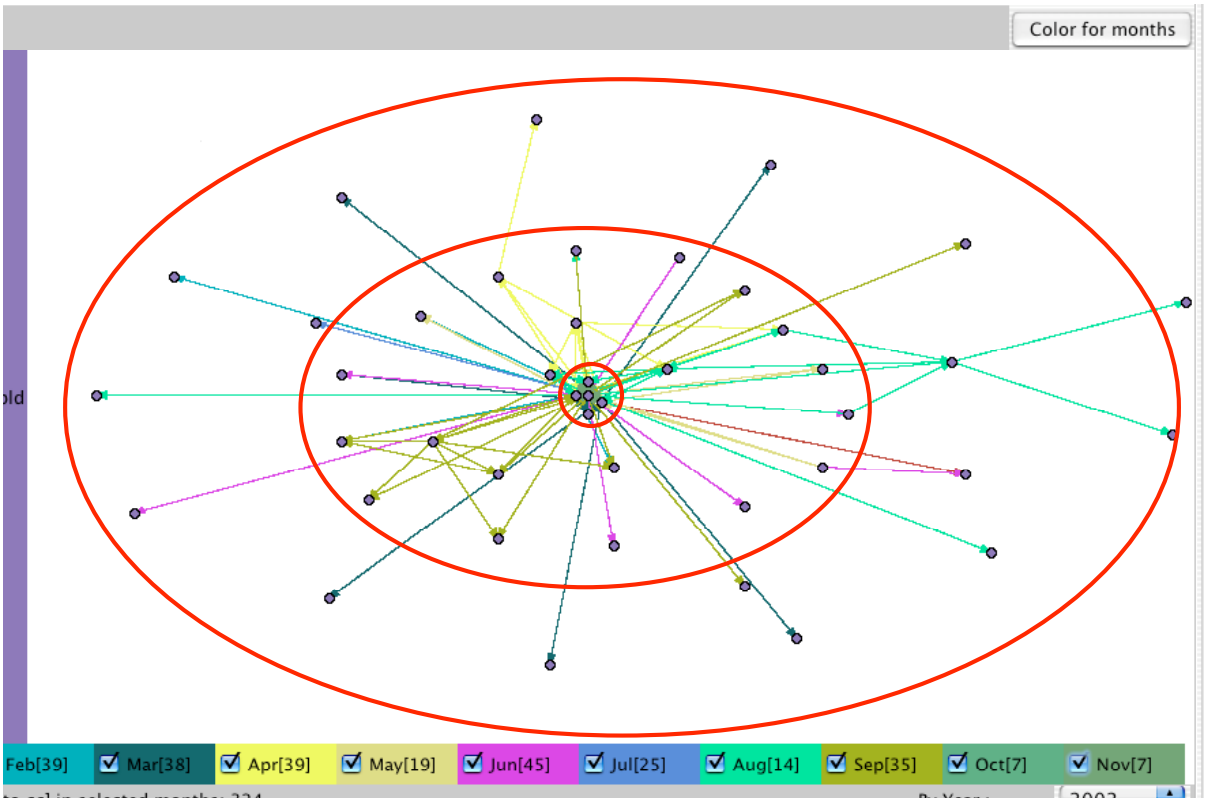

Figure 3. Near-perfect small world scale-free communication flow in e.Xpert community: The e-champion core team is entirely connected (innermost circle), extended core team (middle circle), e.Xperts outermost circle.

The e.Xpert network is an excellent example of such a hub and spoke scale-free small world. Figure 3 displays a screen shot of the communication flow in the e.Xpert community. The people represented by the red dots in the core are the e-champions, acting as hubs of trust. The coordinator of the community is in the center of the network, and is communicating with everybody. The e-champions are actively communicating among themselves. The other e.Xperts mostly talk to e-champions and the coordinator, but have very little communication among themselves. This is a typical scale-free structure, with a highly connected center, and a large number of peripheral people who are mostly connected to the center. As long as the e-champions remain active, large numbers of e.Xperts can be added or removed without any risk to the overall network. On the other hand, if just a few of the e-champions leave, the e.Xpert network would dissolve. The central coordinator has a critical role, if he leaves, many e.Xperts would not be reachable anymore. The e.Xpert network is also a small world: because of the high connectivity of the e-champions, most e.Xperts have a degree of separation of three, which means that the path from one peripheral e.Xpert to another e.Xpert is just three steps: from the e.Xpert to her e-champion, then to another e-champion, and then to the destination e.Xpert.

5. Principles for an Ethical Code for a COIN

"The Internet has become a grossly commercialized Wild West in so many ways. But the community spirit on which it was founded is alive and well. The Net depends on the same spirit that motivates volunteers in the physical world: a commitment to solve problems and make life better for those who might otherwise not have the resources or expertise.

…. there are thousands of others who quietly do their best for the larger community. They run e-mail lists and maintain software archives, fight viruses and bugs, and so much more. They maintain an old-fashioned credo of altruism in an era when the idea of a commons is under attack." [Gillmor, 2003]

An ethical code sets down the rules and principles that should be followed by all associates of a group. Because COIN members are deeply and intrinsically motivated citizens of their community, they stick to their code of ethics similarly to citizens of a country sticking to their laws and following the rules of their society. For COIN, we can derive an ethical axiom from the "Theory of Justice" of John Rawls [Rawls, 1971]: All social primary goods - liberty and opportunity, income and wealth, and the bases of self-respect - are to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favored. In a COIN, the primary good to be distributed is knowledge, and the most knowledge is given to the least knowledgeable members of the COIN. This is to the long-term benefit of the COIN, because the more knowledge the individual COIN members gain, the more productively they can work together towards the common goals of the COIN.

The Tao of the IETF (Internet Engineering Task Force) gives a practical example of an ethical code for a virtual community of innovation. It defines the rules and the way how the IETF operates and how its members work together.

"The purpose of this … is to explain to the newcomers how the IETF works. This will give them a warm, fuzzy feeling and enable them to make the meeting more productive for everyone. This … will also provide the mundane bits of information which everyone who attends an IETF meeting should know." [IETF, 1994]

IETF working groups operate as COIN, with the mailing lists of the working groups acting as the main means of communication. Active IETF members usually meet face-to-face just three times per year at the IETF meetings. The Tao of IETF defines the ethical code of how IETF members treat each other online and when meeting face-to-face. It defines the obvious such as how to register for meetings, and how to participate in the standards development process. But it also contains implicit rules of group behavior such as the dress code and the etiquette at IETF social events.

An ethical code such as the Tao of the IETF sets down the informal rules and principles, which should be followed by all members of the community. The ethical code of a COIN is the main "glue" which holds it together. Rewards in a COIN are given mostly in the form of peer recognition, punishment by withholding recognition or exclusion for really bad offenders. The behavioral code of conduct in online communities can be traced back to the Golden rule: "only do to others what you would like others do to you." It consists of the following four rules:

(1) Respect your elders: while COIN have an egalitarian culture, the leaders or gurus of a COIN define the future direction it will be taking. Elders are respected not because of their hierarchical position, but because of their vision. Frequently they are also among the most experienced subject matter experts of a community.

(2) Be courteous with your fellow members: Members of a COIN are expected to treat each other with mutual respect. For example, "flaming" other COIN members in public by sending negative comments to a mailing list is a serious breach of etiquette. Rather, it is expected that negative comments be made in private in a constructive way.

(3) Only say something if you have something to say: It is expected that junior members of a community acquire their knowledge not by asking "naïve" questions in public, but by studying the FAQ (frequently asked questions) lists and by privately consulting recognized knowledge experts. New members are also expected to become knowledgeable as quickly as possible in their community.

(4) Be ready to help your fellow community members: Senior members, knowledge experts, and gurus are usually quite accessible. Recognized knowledge experts are expected to freely share what they know, educating more junior members so that they become knowledgeable themselves.

A recent dialogue in the SOCNET [SOC, 2004] mailing list illustrates how the four rules govern the way in which members of the SOCNET COIN treat each other. End of November 2003 somebody asked a "naïve" questions breaking rule (3) and wasting the bandwidth of the group. He got the following reply:

"It is amazing how smart people on this list do not know how to use Google!"

But, because this reply was considered too rude and breaking rule (2) by being too close to "flaming", the person giving the advice to use Google was reprimanded himself for breaking rules (2) and also (4) of not wanting to help fellow community members:

"Nothing personal here. Actually, from the past emails, I knew that you are one of the most active and willing-to-help person in this list. But you know, for a newbie, a right pointer to the right article as start-learning-point can help them a lot and save them a lot of time."

In the discussion that arose out of this exchange of messages, the original questioner asking the "naïve" question was finally advised to apply rule (1) of showing respect to his elders when asking questions:

"It's been my experience on USENET and other forums where you are making a written (email) request to a group of experts, that it's a good idea to show the work that you have already done to try and solve your problem or answer your question."

The guiding principles of the ethical code for COIN allow an intelligent questioning of the rules. Members of COIN demonstrate a "feel" for their community, treating each other with dignity and esteem. Similarly, leaders of COIN interfere relatively little into the daily activities of their community, just letting it operate based on the shared code of ethics. For example, while it is very clear that Linus Torvalds is in charge of directing the future development of Linux, he is doing this in a very subtle way without using his hierarchical position and is not getting involved into the "fussy" details of day-to-day operations [Moon & Sproull, 2000]. A common "code of ethics" which members carry in their genes coordinates the working behavior of COIN affiliates. By living according to those mostly unwritten behavioral rules, COIN members are implicitly more sociable than many societies which live by a written rigorous law. As COIN members participate out of their free will and usually are not paid to work, they expect and exhibit fairness, compassion, and altruism. COIN members go out and help others because they expect others to do the same for them.

An ethical code for COIN subsumes altruistic behavior, compassion for fellow COIN members, and moderation and humility of their leaders. An ethical code for a COIN can be summarized in four terms: **reciprocity, transparency, consistency**, and **rationality**.

Reciprocity, the principle of taking and giving is at the core of successful innovation communities. COIN members are willing to help, they share what they know with others, but they expect similar behavior from the other members of their COIN as well. Reciprocity is a direct consequence of the application of the Golden rule: "only do to others what you would like others do to you." For example, open source software developers contribute their code because they expect their co-developers to do the same, so that everybody might enjoy the benefits of sharing the software code.

Transparency means that rules are made explicit, and the role and responsibilities of every COIN member are obvious to the whole community. In a COIN, the strengths and weaknesses of every member are exposed, but contributions are made transparent also. For example, the skills and the role of every programmer are obvious to all members working on a common open source software project. All team members expect to get fair credit for their contributions, as getting recognized by peers is one of the main motivations for COIN participants.

Consistency means that each and every COIN member behaves according to a shared ethical code, and delivers on promises made to the community. Under the same boundary conditions, similar actions will produce the same results. Consistency is the basic requisite for fair treatment of all COIN members. For example, open source developers are expected to stick to the programming rules and guidelines that are in effect for their project. Members of the Debian Linux distribution have defined the Debian Social Contract [Debian, 2003] to ensure consistent behavior of their leadership and of all COIN members.

Rationality means that actions within the community are grounded in reason and not in randomness. Innovation communities are driven by learning, logic and a shared vision of working towards "furthering the state of the art." For example, in an open source software project, it is expected that roles will be filled strictly on the basis of merit, and not because of previous relationship, hierarchical positions, or other non-project relevant criteria.

COIN members behave along those guidelines without being aware of it. The four properties of reciprocity, transparency, consistency, and rationality are part of their "genetic code" similar to the swarming behavior of ants [Bonabeau, 1999], enabling COIN members to work towards a larger goal as a self-organizing team where each team member does not have to know the details all the time.

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