The Potentialities of Fiction for Understanding a New Work Organization, Knotworking

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Abstract. *The purpose of this paper is to investigate the nature of knotworking and what we can understand about knotworking through reading a detective story,* The Sinister Pig. *In "Knotworking and agency in fluid organizational fields," Yrjö Engeström refers to Tony Hillerman's novel,* The Sinister Pig*, to show an emerging organizational form in real life: knotworking. Claiming that fiction often vividly reflects a variety of social changes, Engeström examines* The Sinister Pig *as a story that presents a new way of collaboration among individuals, which can be applied to his concept of knotworking. In this paper, I describe Engeström's perspective in his article and then analyze* The Sinister Pig *further to conclude that the essence of knotworking lies in striving for "freedom from the bondage of habit" (Bateson, 1972, p. 304).*

Keywords: *Knotworking, momentary center, distributed agents, aggregating mechanism, context, Learning II subjects*

Introduction

A novel reflects to a greater or lesser extent our society. In other words, when a writer writes his or her novel, it mediates social reality (Reising, 1986, p. 34). In his monumental study of America, Alexis de Tocqueville (2003, p. 549) points out that "the connections between the social and political conditions of a nation and the genius of its writers are always very numerous; whoever knows one is never completely unaware of the other," implying that novels and social reality are inseparably related to each other. Consequently, we can sometimes fully realize a variety of social changes through fiction.

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In his article, "Knotworking and agency in fluid organizational fields," Yrjö Engeström (2008) analyzes Tony Hillerman's mystery novel, *The Sinister Pig* (2003), to show an emerging organizational form in real life: knotworking. Claiming that "fiction is often more sensitive to the changing landscape of societal life than are our everyday descriptive accounts or scientific analyses" (Engeström, 2008, p. 216), Engeström takes up *The Sinister Pig* to present a new way of collaboration between people belonging to diverse organizations, as we experience in real life. If this way of collaboration actually produces a knotworking formation, then what is knotworking? What can we understand about knotworking through a piece of fiction? These are the questions we examine in this paper. To begin with, I would like to focus our attention on the social context of knotworking, following Engeström's explanation.

Changes in Work Organizations

As times change, so do work organizations. According to Engeström (2006, 2008), work organizations in capitalism have been historically built on the principles of hierarchy, market, and network. First, in traditional mass production, hierarchies strongly systematize work organizations for better internal communication. Such organizations, however, inevitably become hidebound and exclusive. Second, in marketing organizations, while there is considerable flexibility toward the demands of customers, collaboration and reciprocity between different firms are likely to be left out in their enthusiasm to avoid falling behind in a competitive environment. But "these two classic forms of organizing work in capitalism are increasingly being challenged or even replaced by various forms of networks in which different organizations or organizational units seek new innovations by means of collaboration across traditional boundaries" (Engeström, 2008, pp. 207-208). Such challenging forms of networks, for example, remind us of the success of Silicon Valley in the high-technology field.

> Ordinarily, the members of competing organizations share little trust. But in Silicon Valley, different firms seemed willing to cooperate to an extraordinary degree. With employees shifting jobs frequently, those in separate firms often worked together previously, and the culture of computer engineers made technical cooperation and achievement more important than firm loyalty or high salary. This may have been true in Boston as well, but in Silicon Valley, companies readily exploited important interpersonal links that cut across firm boundaries. A freewheeling and open Californian culture, in contrast to a more closed and proprietary nature in New England, seemed to make a huge difference. (Buchanan, 2002, p. 206)

In recent years, reciprocal exchanges across traditional boundaries in different firms have been increasing, as if they accompany rapid progress of "a far

more dynamic, electronically based, network-mediated, global system of sequencing and coordination" (Mitchell, 2003, p. 14). Thus, in different firms, such social networks with rather weak ties could be freely established in the manner that we use electronic devices to communicate with people in remote corners of the globe. Barry Wellman (2002, p. 91) points out that "In a networked society, boundaries are more permeable, interactions are with diverse others, links switch among multiple networks, and hierarchies are flatter and organizational structures more complex." However, in each company, which must make an adequate profit from its own business, a member's role and links with different organizations tend to be stable, so we can say that the network is significantly limited in the system of information exchange (Engeström, 2008, p. 208). In a sense, the network between different firms lacks sustained creativity due to its limited nature.

Needless to say, people, organizations, and organizational units have various objects and goals. One group that has a clear aim and rules among the members will not lose its sense of direction. In that case, there must be trust and understanding among the members, which form "so-called social capital" (Buchanan, 2002, p. 201). Yet in forming alliances with other groups that have different values and purposes, the members will hesitate about which direction to take unless a new goal and rules are established. Such differences bring practitioners a difficult situation when they collaborate with others, as Engeström (2008, p. 204) states:

> In complex activity systems such as today's work organizations, it is difficult for practitioners to construct a connection between the goals of their ongoing actions and the more durable object/motive of the collective activity system. Objects resist and bite back: they seem to have lives of their own. But objects and motives are hard to articulate: they appear to be vague, fuzzy, multifaceted, amoeba-like, and often fragmented or contested. The paradox is that objects/motives give directionality, purpose, and meaning to the collective activity, yet they are frustratingly elusive.

The question then arises about elusive objects/motives in complex activity systems. Surveying historical change in work organization, Engeström (2006, 2008) advances an alternative organizational form: knotworking. In the following, we now briefly overview this concept.

Knotworking as a New Social Organizational Form

We may say that the concept of knotworking, which is different from hierarchy, market, or networked organization, adapts to the new era of mass collaboration between different organizations. Since knotworking focuses on negotiation and collective activity rather than individual talents and skills, it seems difficult to understand, probably because the center of control is not settled in its

formation. Instead, the center changes extemporarily in the process of collaboration, which means that not only objects and motives but also rules become "vague, fuzzy, multifaceted, amoeba-like." In short, knotworking is mainly characterized in Engeström's terms: "The center does not hold" (Engeström, 2000, p. 972). Such peculiarity of knotworking is similar to networking that arises from communication through mobile technologies, since centralized control does not exist in network communities. Howard Rheingold (2004, p. 191) calls people who act in the network community, despite the fact that they do not know each other, "smart mobs." What is the difference between knotworking and networking? Engeström (2008, p. 210) argues that the latter seems to be short-term organizational forms. In contrast, knotworking focuses on the long term. However, I would like to focus attention on another difference between them: In knotworking organizational forms, the center is more important, even if it is not fixed, than in networking, where the center becomes blurred or absent. Abstractly speaking, knotworking includes both vertical and horizontal organizational forms.

In knotworking, participants become collaborators to create a new way of organizing work without a fixed center, solving problems as they face them. Thus, they need to flexibly change the roles in the work. In other words, their flexibility makes the centers change due to the variation in circumstances. Engeström (2000, p.972) writes:

> The notion of knot refers to rapidly pulsating, distributed and partially improvised orchestration of collaborative performance between otherwise loosely connected actors and activity systems. A movement of tying, untying and retying together seemingly separate threads of activity characterizes knotworking. The tying and dissolution of a knot of collaborative work is not reducible to any specific individual or fixed organizational entity as the center of control. The center does not hold. The locus of initiative changes from moment to moment within a knotworking sequence.

This organizational formation, far from the top-down style of management, can be associated with the Linux community, in which people share a computer program and its source code to improve them through the Internet without any centralized control regulating this development (Engeström, 2000, p. 973; 2006, p. 7; 2008, p. 209). The model of such formation is surprisingly old, and it may be possible to trace it back to ancient times (Capra, 2004, p. 26). Eric Steven Raymond (2001, p. 52) quotes from the 19th-century Russian anarchist Pyotr Alexeyvich Kropotkin's *Memoirs of a Revolutionist* to show what the Linux project demands of programmers in the community:

> Having been brought up in a serf-owner's family, I entered active life, like all young men of my time, with a great deal of confidence in the necessity of commanding, ordering, scolding, punishing and the like. But when, at

> an early stage, I had to manage serious enterprises and to deal with [free] men, and when each mistake would lead at once to heavy consequences, I began to appreciate the difference between acting on the principle of command and discipline and acting on the principle of common understanding. The former works admirably in a military parade, but it is worth nothing where real life is concerned, and the aim can be achieved only through the severe effort of many converging wills.

Raymond points out that, in addition to a cheap Internet, "The severe effort of many converging wills" was essential for the achievement of Linux. Yet, it is not too far from the truth to say that, in a collaborative community, there is inevitably someone who realizes the importance of common understanding or the context of activity and acts as the center of control, even if only assuming a temporary role. In the case of Linux, the developer, Linus Torvalds, and a small number of programmers who "vet every potential change of the operating-system source code" (Surowiecki, 2004, p. 74) play a central part. Similarly, in a knotworking community, both such an effort and a (momentary) center will be required. Engeström's terms, "The center does not hold," suggest the importance of the center, for they do *not* mean the lack of a center.

Knotworking is not limited to the field of computers. Engeström (2000, 2008) refers to an empirical case from medical work in Helsinki, Finland as an example of knotworking, in which a hospital physician, a nurse, a specialist (one example is a lung specialist), and researchers collaborate in the treatment of a patient who has multiple chronic problems and moves between different care providers. In such a case, it is likely that conflicts and contradictions arise between participants, because each one belongs to different organizations and follows the rules of his or her organization.

> When an activity system adopts a new element from the outside (for example, a new technology or a new object), it often leads to an aggravated secondary contradiction whereby some old element (for example, the rules or the division of labor) collides with the new one. Such contradictions generate disturbances and conflicts, but also innovative attempts to change the activity. (Engeström, 2008, p.206)

As long as the participants cling to their own rules, they will not be able to collaborate among themselves. They have to change the rules to make the collaboration a success. As a result, they will deviate from the norm to create a new way of organizing work because, as Frank Zappa (1989, pp. 185) emphasizes from the point of view of an experienced composer and musician, *"Without deviation (from the norm),* **'progress'** *is not possible"* (italics in the original). Moreover, what is important here is that contradictions act as a trigger of such deviation and collaboration. The concept of knotworking places emphasis on contradiction as a necessary condition of mass collaboration. Therefore,

we may say that the center of control is where a contradiction occurs and aggregates participants' various opinions. But if it is an imposed stable center, it will not be able to play a part in resolving the contradiction because of its lack of flexibility. The center must be temporary. With these features of knotworking in mind, we will now take a look at Engeström's analysis of Hillerman's novel, *The Sinister Pig*, and the knotworking-like aspects of the novel to delve further into knotworking.

Engeström's Analysis of *The Sinister Pig*

In the beginning of *The Sinister Pig*, an ex-CIA agent, Carl Mankin (whose real name is Gordon Stein), is shot in the Four Corners region while investigating a money-laundering scheme. Although this homicide case is covered up by the FBI, it leads to an organized crime operation involving drug smuggling. The drug syndicate, which maintains a connection to a senator in Washington, uses abandoned oil pipelines to transport drugs from Mexico to New Mexico. Meanwhile, various people working beyond traditional boundaries in different institutions try to solve the mysterious crime. The mystery is cleared up thanks to the united efforts of a large number of people, although there are few central characters in the novel. These characters include a sergeant in the Navajo Tribal Police, Jim Chee, an agent of the Border Patrol, Bernie Manuelito, and a former lieutenant of the Navajo Tribal Police, Joe Leaphorn. Chee cooperates with Bernie and Leaphorn and enlists the help of a Bureau of Land Management Enforcement Officer, Cowboy Dashee, in the probe. The people who contribute to solving the crime have strong or weak connections with each other, but each one rejects top-down control. They are distributed agents who are not obsessed with control (Engeström, 2008, p. 202). Engeström illustrates the network of distributed agents in the novel by using a diagram as follows:

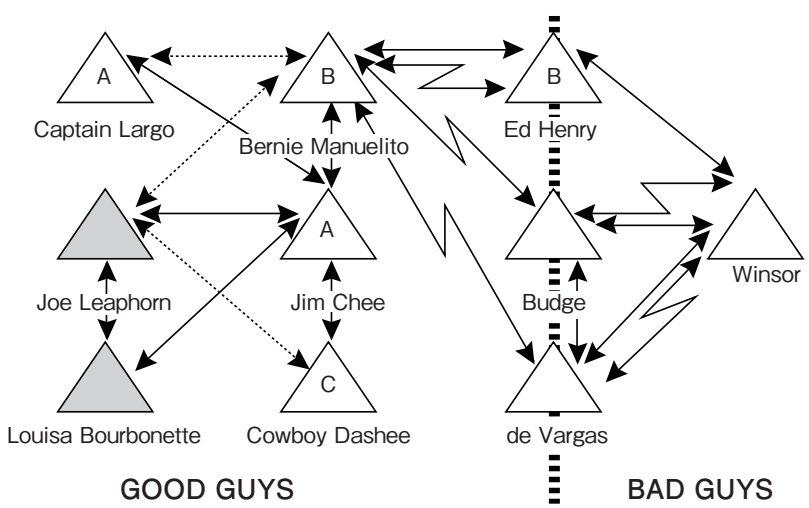

FIGURE 1 Network of distributed agency in *The Sinister Pig*. (Engeström, 2008, p. 212)

First, in the diagram, Engeström divides the characters into two groups: good guys and bad guys. (Ed Henry, Budge and de Vargas are on the borderline between good and bad. Their characters depend on the relation with Bernie Manuelito or Winsor). Second, the relationships among them are indicated by three types of arrows: The unbroken two-headed arrows mean strong relationships of collaboration, the dotted arrows weak relationships, and the lightning-shaped arrows hostile relationships. Third, A, B, and C denote three law-enforcement agencies: the Navajo Tribal Police, the Border Patrol, and the Bureau of Land Management Enforcement. Leaphorn and Bourbonette are unofficial actors (Engeström, 2008, pp. 211-212).

Engeström (p. 210) uses this diagram to examine the next question: "What might be the nature of collective intentionality, or distributed agency, in knotworking and social production?" Applying five principles of activity theory ([1] object orientation, [2] mediation by tools and signs, [3] mutual constitution actions and activity, [4] contradictions and deviations as source of change, [5] historicity) in the examination, Engeström (p. 216) concludes that:

> In Hillerman's story, there is no fixed and stable center of control and command, individual or collective: The center does not hold. Yet, the job gets done, and various inviduals [*sic*] and subgroups contribute to the achievement in an intentional and deliberate manner. Moreover, it does not seem satisfactory to characterize the process simply as an accidental aggregation or combination of individual and subgroup efforts. There is a strong attempt among all participants to grasp and resolve the complex whole, even though it seems hopelessly beyond the limits of each participant's horizon of understanding and capability.

It is certainly very important that Engeström points out that "the center does not hold" in this detective fiction because such a condition of work organization has an air of authenticity. From this viewpoint, one may say that the momentary center or, to take it in a broad sense, the ever-changing organization, is the nature of collective intentionality or distributed agency in knotworking. However, it remains an unsettled question why the job could get done by multiple people. The question should be considered from various angles. Although Engeström (*ibid.*) provides an answer to the question ("In the story, the job gets done by means of numerous seemingly separate or weakly connected strings of actions that take place over an extended period of time and far apart from one another in geographical space"), there is no conclusive proof that momentary centers or scattered people lead to a collaborative type of work organization to solve complex problems. The main reason is that we do not know the mechanism of aggregation. If we presume that, as I have mentioned before, contradiction between distributed agents brings about mass collaboration, what is the specific mechanism of aggregation in *The Sinister Pig*? James Surowiecki (2004, p. 74) points out that "a decentralized system can only

produce genuinely intelligent results if there's a means of aggregating the information of everyone in the system." Moreover, Surowiecki (p. 76) states that "it's hard to make real decentralization work, and hard to keep it going, and easy for decentralization to become disorganization." For the present, it may be useful to look more closely at some of the more important features of the novel.

Multiple Collaborators and "Save the Cat"

Needless to say, there are some other characters who do not appear in Engeström's diagram of *The Sinister Pig*. One of them is a reporter of *U.S. News and World Report*, Mary Goddard, who visits Joe Leaphorn to ask him about the murder of the phony Carl Mankin in chapter thirteen. In spite of the fact that Leaphorn was reluctant to answer at first, he becomes increasingly interested in the process of exchanging confidential information on financial shenanigans behind the homicide case ["He looked at Ms. Goddard with sharply increased interest." (Hillerman, 2003, p. 148)]. Although Goddard is a bit player in the novel, it is likely that she stimulated Leaphorn's motivation to solve the mysterious crime. In that sense, we can say that Goddard is an indirect contributor toward the investigation of the crime beyond boundaries between different organizations. Similarly, we can add other personae in the diagram, but the point I wish to emphasize is that they or *we* always have latent possibilities for contributing toward the problem's resolution. The reason I said *we* is that Engeström (2008, p. 211) introduces an anecdote about an encounter between Hillerman and a female reader who indirectly encouraged the author to put two characters, namely Chee and Leaphorn, in the same book. John M. Reilly (1996, p. 19) said, "Since that time he [Hillerman] has worked diligently to exploit character differences between Joe Leaphorn and Jim Chee." It was a chance encounter occurring during a publicity tour, but we can regard the reader as a sort of collaborator not only in Hillerman's writing but also in knotworking in *The Sinister Pig*. Without the reader's suggestion, Chee would not have worked together with Leaphorn. Like her, we as readers will be able to become indirect contributors to the investigation of the crime. But how?

In his diagram, as we have seen, Engeström divides the actors into good guys and bad guys. Budge and de Vargas are placed on the boundary despite the fact that they are undoubtedly murderers, probably because they save Bernie in defiance of Winsor's order for the killing and supply her with information about drug smuggling in the climax of the mystery story. Consequently, legally speaking, the diagram is non-objective, and two words, good and bad, imply Engeström's ethical judgment about the actors, although this is not to say that legal judgment always has objectivity. However, we may say that Engeström participates in the novel through the analysis of his configuration of the actors. In other words, scrutinizing connections between the actors, Engeström understands the context of the story in order to judge. As Gregory Bateson (2002, p.

14) points out, "Without context, words and actions have no meaning at all." It is fair, thus, to say that Engeström is also a collaborator in *The Sinister Pig*.

My views have much in common with reader-response criticism. Namely, the meaning of the text depends on the reader's interpretation. Relevant to this criticism is Wolfgang Iser's (1980, p. 54) following remark:

> Whatever we have read sinks into our memory and is foreshortened. It may later be evoked again and set against a different background with the result that the reader is enabled to develop hitherto unforeseeable connections. The memory evoked, however, can never reassume its original shape, for this would mean that memory and perception were identical, which is manifestly not so. The new background brings to light new aspects of what we had committed to memory; conversely these, in turn, shed their light on the new background, thus arousing more complex anticipations. Thus, the reader, in establishing these inter-relations between past, present, and future, actually causes the text to reveal its potential multiplicity of connections. These connections are the product of the reader's mind working on the raw material of the text, though they are not the text itself for this consists just of sentences, statements, information, etc.

After this passage, Iser (*ibid.*) says, "This is why the reader often feels involved in events which, at the time of reading, seem real to him, even though in fact they are very far from his own reality." While the reader consciously or unconsciously builds up some connection with fictitious characters, he or she discloses "hitherto unforeseeable connections" as a result of reading, which leads to various interpretations on the text. And therefore, we can say that the reader recreates the world of the text by his or her imagination. However, two questions arise: Why on earth do readers want to participate in fiction? How does it attract readers to the fictional world? These questions will lead us further into a consideration of *The Sinister Pig*. There are some examples from the novel, which provide us with an answer.

It is obvious that the author portrays "bad guys" as humane characters, regardless of their lawbreaking, as if to connect readers with them. One example is a scene in chapter twenty two, which makes us to want to take sides with Budge. When working as chauffeur for Winsor's lover, Chrissy, Budge is commanded to kill her by Winsor. But Budge releases her beyond Winsor's reach, for Budge has developed a warm friendship with her. One can safely state that such a scene is, to borrow Blake Snyder's phrase, a "Save the Cat" scene. In his primer on screenwriting, Snyder (2005, p. xv) says, "It's the scene where we meet the hero and the hero *does* something — like saving a cat — that defines who he is and makes us, the audience, like him" (italics in the original). Snyder (*ibid.*) gives an example of this type of scene from a movie:

> In the thriller, *Sea of Love*, Al Pacino is a cop. Scene One finds him in the

> middle of a sting operation. Parole violators have been lured by the promise of meeting the N.Y. Yankees, but when they arrive it's Al and his cop buddies waiting to bust them. So Al's "cool." (He's got a cool idea for a sting anyway.) But on his way out he also does something nice. Al spots another lawbreaker, who's brought his son, coming late to the sting. Seeing the Dad with his kid, Al flashes his badge at the man who nods in understanding and exits quick. Al lets this guy off the hook because he has his young son with him. And just so you know Al hasn't gone totally soft, he also gets to say a cool line to the crook: "Catch you later…" Well, I don't know about you, but I *like* Al. (italics in the original)

The Sinister Pig has two more Save the Cat examples. The first one resembles *Sea of Love* in the appearance of a child. In chapter three, Bernie recounts an episode to her colleague, Eleanda Garza, to explain Sergeant Chee's tenderness for the weak as follows: There was a fatal hit-and-run accident. The truck driver was too drunk to notice what he did. After the accident, he felt guilty and sent two hundred dollars to the victim's family every month. But Chee found the bumper stickers on the truck as a clue to the driver's whereabouts. When Chee went to the driver's house to arrest him, Chee saw his grandson whom he brought up. Instead of seeking the driver, Chee gave the boy a new set of bumper stickers. Of course, Eleanda's reaction to this story is pragmatic: "Pretty risky for a cop to do that" (Hillerman, 2003, p. 32). But we can say that it is a Save the Cat story. Second, when Bernie is on the beat as a Customs patrol officer, she finds some illegal immigrants, a family of dehydrated farmers. They paid a "damned coyote" all of their money for fraudulent visa credentials; consequently, they were "poorer than ever" (p. 170). Bernie gives them water and shows her sympathy for them, although they are hauled in as criminals. One of the captives says to her, "You have been very kind to us" (p. 172). In these episodes, the hero or heroine does something like Save the Cat, which makes us root for him or her.

What is important here is not the difference between the detective fiction and the (Hollywood) movie but *The Sinister Pig*'s inclusiveness provided by Save the Cat scenes. *The Sinister Pig*, as mentioned above, encourages us to interact with the actors even if they perform illicit activities, and thus we can easily take part in the world of the novel. As a result, there is a strong possibility for us to indirectly become the actors' collaborators. Moreover, in the tradition of detective fiction, we may say that this inclusiveness is a peculiarity of a story dealing with crime and exploration, both of which allow us to interfere because they "do not define the actions which are their content" (Bateson, 2002, p. 130). Regarding Edgar Alan Poe as the father of detective fiction, Reilly distinguishes the conventions of newspaper crime reports and the formula of detective fiction established by Poe. Whereas the former "lead readers across a bridge to vicarious participation in the terror of crime," the latter "invites readers to move away from terror and to share instead the pleasure to be found in

the process of problem solving, which is, of course, the means by which we reduce the terror presented us by the world" (Reilly, 1996, p. 14). As for *The Sinister Pig*, we cannot deny that the novel leads us to empathic participation like newspaper crime reports. Some Save the Cat scenes of the novel attest to this aspect. Yet because of the nature of *The Sinister Pig* as detective fiction, we will be able to participate in the process of problem solving, and also correct previous contexts again and again to place the actors in the manner of the author or Engeström. We become indirect contributors or distributed agents in this way.

Mechanism of Aggregation in *The Sinister Pig*

While, as I quoted before from Engeström, in *The Sinister Pig* "the job gets done by means of numerous seemingly separate or weakly connected strings of actions that take place over an extended period of time and far apart from one another in geographical space," it is possible that in defining the context of the story, the reader also contributes to the job beyond time and space, for "Without context, words and actions have no meaning at all." Needles to say, the story needs context, but, strictly speaking, it would be untrue to say that only the reader relates to context, "since context includes rules of language, the situation of the author and the reader, and anything else that might conceivably be relevant" (Culler, 1997, p. 67). Thus, context is attributed to not individuals but all sorts of relations. Here, for example, is a passage from Michel Foucault's *The Order of Things*:

> In the second part of the novel, Don Quixote meets characters who have read the first part of his story and recognize him, the real man, as the hero of the book. Cervantes's text turns back upon itself, thrusts itself back into its own destiny, and becomes the object of its own narrative. The first part of the hero's adventures plays in the second part the role originally assumed by the chivalric romances. Don Quixote must remain faithful to the book that he has now become in reality; he must protect it from errors, from counterfeits, from apocryphal sequels; he must fill in the details that have been left out; he must preserve its truth. (Foucault, 1970, p. 48)

This quotation indicates that Don Quixote performs simultaneously multiple positions, including those of the book's hero, it reader, the author, and the book itself ("since he is the book in flesh and blood" [*ibid.*]) beyond the boundary between fact and fiction. We cannot decide whether Don Quixote is the center of the fictional world or not, for the fictional world seems to melt into reality. According to Foucault (p. 46), Don Quixote's adventures "mark the end of the old interplay between resemblance and signs and contain the beginnings of new relations," which implies that *Don Quixote* heralds the dawn of modern literature. To examine how modern literature deals with the prob-

lem of representation is not important here, but it is interesting to note that Don Quixote is regarded as "quixotic" in the modern world (Berman, 1981, p. 76); on the contrary, until this new dawn, connecting resemblance with signs, literary works have been able to cause various boundary crossings as Don Quixote did. Yet we may say that a quixotic work reflects real societal life better than modern literature. In a quixotic fiction, the functions of all participants, including character, writer, reader, and book, seem to become changeable due to the great diversity in the relationships among participants. As a relationship becomes different, context keeps on changing as in real life in spite of it being quixotic. Consequently, the context remains unstable unless a momentary center of control appears to prevent the fiction (the fact?) from producing disorder. However, the center usually appears somewhere in reality. If nobody acts as the temporary nucleus of actions, context will get out of shape. This is the problem of the mechanism of aggregation.

Let us now return to *The Sinister Pig*. Considering the novel to be like *Don Quixote*, in which "the old interplay between resemblance and signs" barely functions, how can we approach the question about aggregation? We examine it with the help of Gregory Bateson's work because his thinking is holistic and crosses borders among disciplines like premodern fiction. While Bateson (2002, p. 4) investigates "a single knowing which characterizes evolution as well as *aggregates* of humans" (italics in the original), his thought will be helpful to us. (I think his thought can be condensed to his own expression: "I surrender to the belief that my knowing is a small part of a wider integrated knowing that knits the entire biosphere or creation" [p. 82].)

In the preceding section I referred to a reporter of *U.S. News and World Report*, Mary Goddard, who tipped off Leaphorn to the Carl Mankin murder case, as an indirect contributor toward the investigation. Leaphorn is motivated by her visit because what she said was "far from what he'd expected" (Hillerman, 2003, p. 148). It must be noted that Leaphorn was already ready to accept information from her. Before her visit, Leaphorn received a visit from two prosecutors, Dan Mundy and Jason Ackerman, who asked about the mysterious homicide case. Their visit rouses Leaphorn's interest as follows.

> "So I'd think," Leaphorn said. He sampled his own coffee. "You know I'm retired now. It's not my business."
>
> Ackerman shifted his briefcase in his lap. "We'd like to make it your business," he said, smiling at Leaphorn.
>
> "Now I'm curious," Leaphorn said. "Why would you want to do that?"
>
> "We need to know more about that case," Mundy said.
>
> Leaphorn was beginning to enjoy this sparring. (Hillerman, 2003, pp. 86-87)

> "Mr. Leaphorn is right about that, of course," Ackerman said. "But we think something connected with that problem must have been going on

> out here. Maybe part of the puzzle is here. Maybe not. But we'd like to know what."
>
> Leaphorn felt another increase in his interest in this visit, this one sharp.
>
> "Connected? This sounds like you think this homicide fits into that. How could that be?" (Hillerman, 2003, p. 88)

These visits, including Goddard's, prompt Leaphorn to inspect the murder, with the result that he elucidates the broader context. After that, Leaphorn conveys to Chee the connection between abandoned oil pipelines that Mankin might probe and drug smuggling:

> "So," he [Chee] said, "are you thinking they're using the old pipeline to smuggle something in. Like dope, perhaps. Or nuclear devices for Al Qaeda's terrorism campaign, to slip radioactive stuff past radiation detectors. Or maybe to smuggle something out of the country."
>
> "Take your pick," Leaphorn said. "Whichever it is, I think something illegal must be involved. And it's pretty clear some very big money is operating here. (…)" (Hillerman, 2003, p. 210)

From these quotations, we realize that Leaphorn gets new information by perceiving the context. In other words, Leaphorn has always made preparations for new information as if he follows Louis Pasteur's dictum: Chance favors the prepared mind. As for the receipt of information, Bateson's statements on context are instructive. Bateson (2002, p. 43) thinks that the recipient of message material needs the skill to define context because the message will not acquire a meaning without the context. Moreover, Bateson (*ibid.*) goes on to say: "*Readiness* can serve to select components of the random which thereby become new information. But always a supply of random appearances must be available from which new information can be made" (italics in the original). Before turning to an examination of randomness which produces something new, a few remarks should be made concerning context.

Learning I, II, and III in *The Sinister Pig*

Inasmuch as information exits a context and enters a context, there must be an entity who constructs the linkage between the contexts. The entity learns to perceive a series of contexts and makes a larger context that integrates these smaller contexts (Bateson, 1972, p. 245, p. 299). The person who discerns such meta-context, to use Bateson's phrase, reaches the level of "Learning II." To Bateson (2002, p. 110), exchange of information or communication among organisms or human beings is "a sequence of contexts of learning," and he emphasizes the hierarchy of the learning processes. First, when a subject correctly responds to the repeated stimulus because of habituation, the case is applied to "zero learning" (Bateson, 1972, p. 284). Next, Bateson calls a passive

response like Pavlov's dog Learning I (or 'proto-learning'), in which the way a subject responds to a stimulus changes into a correct response. Learning II (or 'deutero-learning') is "learning to learn" (p. 249) as a learner grasps overall context. Learning III is learning to learn Learning II. At this level, the subject resolves contradictions generated at Learning II (p. 305). This achievement is akin to achieving enlightenment in Zen Buddhism: "If you say this stick is real, I will strike you with it. If you say this stick is not real, I will strike you with it. If you don't say anything, I will strike you with it" (p. 208), and thus its achievement becomes extremely difficult. Moreover, a redefinition of the self accompanies it. Morris Berman (1981, pp. 231-232) explains the difficulty:

> In Learning III, the individual learns to change habits acquired in Learning II, the schismogenic habits that double bind us all. He learns that he is a creature who unconsciously achieves Learning II, or he learns to limit or direct his Learning II. Learning III is learning *about* Learning II, about your own "character" and world view. It is a freedom from the bondage of your own personality — an "awakening to ecstasy," as William Bateson [Gregory Bateson's father] once defined true education. This awakening necessarily involves a redefinition of the self, which is the product of one's previous deutero-learning. (italics in the original)

In spite of the difficulty and the danger, Berman (p. 232) raises the following possibility in Learning III: "For others more fortunate, Bateson claims, there is a merger of personal identity with 'all the processes of relationship in some vast ecology or aesthetics....'." As these remarks indicate, Bateson's learning theory is intimately related with one's identity and world view. But for us symbiosis with the world ecosystem is not the point in question. What matters is rather that Learning III brings us an alternative view, but we cannot expect to reach this level without Learning II. Bateson (1972, p. 304) notes that "If Learning II is a learning of the contexts of Learning I, then Learning III should be a learning of the contexts of those contexts," and so these learning levels are hierarchical and inseparable. In addition, let me stress again that these learning levels are always achieved in communication with others. When Engeström (1987, p. 144) tries to reinterpret Bateson's theory of learning from the point of view of human activity, he considers the activity to be social: "Human activity is not only individual production. It is simultaneously and inseparably also social exchange and societal distribution." Learning is one of the human social activities.

Now let me expand Bateson's idea into our consideration of Leaphorn's activity in *The Sinister Pig*. Leaphorn has perceived a series of contexts of the connection between the homicide case and the drug smuggling done through abandoned oil pipelines through communication with Mundy, Ackerman, Goddard, Chee, and his cohabitant, Louisa Bourbonette. We can see from Leaphorn's activity that he understands overall context, hence he reaches at

least Learning II. And it seems reasonable to suppose that such communication leads him to Learning III, for he does not only grasp overall context but also hits upon a good idea with the help of Louisa to take action against the mysterious incident in spite of the fact that it falls beyond the jurisdiction of the Navajo Tribal Police. Let us consider the following scene. Louisa is impatient at Leaphorn's conversation with Chee about the connection between abandoned oil pipelines and drug smuggling:

> "I can't believe this," she said. "You two sitting here, perfectly calm, discussing the mechanics of pipelines, and convincing yourselves that Bernadette Manuelito is in danger of being killed."
>
> Leaphorn stared at her. So did Chee.
>
> "Instead of doing what?" Leaphorn asked. "You want us to kidnap her and bring her home?"
>
> Louisa's expression was disapproving. "Well, you should do something. (…)"
>
> "Yes," Chee said.
>
> "Let's see what we have," Leaphorn said. "No evidence a crime is being committed. We have no jurisdiction if there is a crime. We have no—"
>
> (…)
>
> "I don't see what Jim's thinking," said Louisa. "Let me in on this."
>
> "He's thinking that if that construction site Bernie photographed on the Tuttle Ranch is on public domain land, even a Bureau of Land Management enforcement officer would have a perfectly valid legal right to go in there and make an inspection. Right?"
>
> "Right," Chee said. "At least I think so."
>
> "If you can find one to do it for you," Leaphorn said.
>
> "You remember Cowboy Dashee, don't you, Lieutenant. That Hopi friend of mine who was an Apache County deputy. Well, he's now an officer with the BLM enforcement division." (Hillerman, 2003, pp. 211-213)

It is clear that in discussing the matter with Chee and Louisa, Leaphorn resolved the contradiction between his reasoning and practice. After this, Chee rushes to the scene with the aid of Cowboy Dashee, and as a result, their investigation is completed by various people acting beyond boundaries between different organizations.

Although I focused especially on Leaphorn's activity, it follows from what has been said that not only Leaphorn but also other contributors to the investigation have always prepared for new information about the case as recipients, and so they reached at least Level II. If not, they would have been not collaborators but followers of the person in charge of the territorial jurisdiction because they would not have been able to determine the nature of the matter. Of course, readers are also taken into account as collaborators. For example, the aforementioned female reader at the book signing informed Hillerman of a

double-bind situation: (1) Hillerman changed the name of his detective from Leaphorn to Chee, but (2) she could not tell them apart (Reilly, 1996, p. 19; Engeström, 2008, p. 211). In response to this, Hillerman showed the solution (=Learning III) to the contradiction in the subsequent novels, including *The Sinister Pig*: Leaphorn and Chee work together. In this case, we can say that the reader and Hillerman corrected each previous context, hence the learning was formed. Similarly, other readers who are attracted to the world of *The Sinister Pig* by some Save the Cat scenes will be able to reveal unforeseen connections between the actors by knowing each context in which the actors are placed. Viewed in this light, the attainment of Learning II can be regarded as a condition to trigger the mechanism of aggregation.

We must not forget that Bateson (2002, p. 43) says, "But always a supply of random appearances must be available from which new information can be made." Bateson's assumption is that we cannot make something new out of nothing and that the reverse appears in the stochastic processes of thought, namely "creative thought is fundamentally stochastic" (p. 172). According to Bateson (p. 214), the word stochastic is derived from "Greek, *stochazein*, to shoot with a bow at a target; that is, to scatter events in a partially random manner, some of which achieve a preferred outcome." However, even if a system has some source of randomness, it is not always creative. Whereas all creative systems are "*divergent*; conversely, sequences of events that are predictable are, ipso facto, convergent," the divergent processes demand "a built-in comparator that in evolution is called 'natural selection' and in thought 'preference' or 'reinforcement'" (p. 165, italics in the original) in order not to cause disorder. A creative system is something of a double-edged sword: disorder or innovation. We are concerned here not with evolution but with thought in which "a built-in comparator" selects some components from the products of the random component based on preference or reinforcement. Such a comparator seems to be a kind of convergent system within creative systems in a continuous process of trial and error.

Expanding Bateson's argument into our analysis of *The Sinister Pig* again, we can say that in the novel, the divergence in thought is ensured by distributed individuals, who can each classify information relevant to the investigation of the crime as a Learning II issue. That is, while the individuals supply the source of randomness, one of them or some of them function to aggregate the information of everyone by becoming the ad hoc center of control. Thus, in the novel, as Engeström put it, "the center does not hold," although this term does not mean that there is no centralized control. I agree with Bateson (2002, p. 40) in thinking that it is "nonsense to say that it does not matter which individual man acted as the nucleus for the change." Leaphorn is one of the temporary centers in this fiction. But what has to be noticed is that the center itself does not produce creative thought. Rather, like Leaphorn and his visitors, a relationship or communication with others who have prepared for new information gives birth to both conflict and innovation. And, changing the momentary

center, such relationships will form the entire collective activity in the end.

Conclusion

Mass innovation through web technology such as open source software projects has developed a new form of network, and consequently it has attracted a great deal of attention in academic and business circles in recent years. Considering the phenomena of such innovation, Charles Leadbeater (2008, p. 19) coined a new term, "We-Think," to "comprehend how we think, play, work and create, together, *en masse*, thanks to the web." Leadbeater (pp. 68-83) thinks there are five conditions under which We-Think works. First, there is the core around which a community takes shape. Second, members who have diverse viewpoints contribute toward solving a complex problem. Third, there is a way to connect a person who has his or her own idea with other members who have different ideas. Fourth, in collaboration among people with diverse knowledge, the community has the right leadership, while decision making is open to all participants. Fifth, the collaboration generates a mass social creativity through which participants can get innate pleasure and recognition from their peers. These five conditions apply nearly perfectly to knotworking. Because We-Think and knotworking are both embedded in the same social context, they inevitably take the same direction. However, as I said earlier, knotworking is not limited in the field of mobile technologies. Knotworking formation emerges in different places. *The Sinister Pig* was one of them.

Examining *The Sinister Pig* from the viewpoint of knotworking, we could realize the uniqueness of knotworking as an alternative organizational formation: The center does not hold. In a knotworking formation, some Learning II subjects who are ready for new information gather around a momentary center who acts just like a subject/theme that participants share, and they bridge the "*distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions*" (Engeström, 1987, p. 174, italics in the original) by negotiating with each other. On the other hand, the center keeps changing from one moment to the next, which means that there are various temporary centers that sustain the whole formation as a result. In *The Sinister Pig*, many centers traverse the boundaries between different institutions, the author and the reader, and fiction and fact. In this way knotworking extends the knots to the extent of the rhizome metaphor of Deleuze and Guattari. The concept of rhizome shows us the importance of continuous mutual action between the vertical treelike image and the horizontal rhizomatous image to construct alternative systems to centralized systems: "There exist tree or root structures in rhizomes; conversely, a tree branch or root division may begin to burgeon into a rhizome" (Deleuze & Guattari, 1987, p. 16). Yet Engeström (2008, p. 228) considers the metaphor "somewhat limited" because it emphasizes horizontal connections, so he developed the 'mycorrhizae' meta-

phor for knotworking formation: "It [a mycorrhizae-like formation] is a symbiotic association between a fungus and the roots or rhizoids of a plant." What is important is that such a formation always requires both vertical (momentary) centers and horizontal surroundings. Engeström (2008, p. 229) argues that "without these 'plants' and 'mushrooms,' the knotworking mycorrhizae will not take shape." At the same time, it is important that by changing the center, this formation moves laterally and forms a kind of learning community.

Learning II subjects learn something new through exchange of information with other Learning II subjects in a knotworking formation. However, the group will not build a social system unless there is a means of aggregating the information. As Surowiecki (2004, p. 75) points out, the group's collective solution results from aggregating participants' different opinions. "Aggregation—which could be seen as a curious form of centralization—is therefore paradoxically important to the success of decentralization" (*ibid.*). In the case of knotworking, what is the aggregating mechanism? In the case of We-Think, Leadbeater (2008, p. 228) suggests that the mechanism is "a desire for recognition." People try to find "recognition for the value of the contribution they can make to a shared endeavour" (*ibid.*), and thus recognition by other people brings smart results. Yet, because Leadbeater's proposition is related to a fundamental issue of identity, built through people's recognition, it leaves unanswered our question. We need a more specific answer.

Several observations in the last few sections concerning *The Sinister Pig* have shown that multiple actors contribute to the investigation of the crime beyond the constraints of time and space by understanding the connections between contexts. As a result, on the one hand they achieve at least Learning II, while on the other hand, they can expect consciously or unconsciously Learning III in communicating with other people, for "Learning III is motivated by the resolution of the contradictions of Level II" (Engeström, 1987, p. 151). We may recall that Leaphorn or the female reader cleared up each contradiction with the help of others. Given that the aggregating mechanism in knotworking is the expectation of getting to Learning III, we can explain the further uniqueness of knotworking. That is, insofar as a knotworking system functions and progresses to Level III, participants become free from their own personalities. According to Bateson (1972, p. 304), "selfhood is a product or aggregate of Learning II," and if a person can learn to "act in terms of the contexts of contexts," he or she will achieve Learning III, where the concept of self is no longer relevant to him or her. Thus, in a different sense from We-Think, knotworking is related to personal identity. Whereas agents in a knotworking formation do not seek recognition of other people but expect Learning III, which produces the resolution of the contradictions they face, their identities begin to merge into the wider context of relationships with others. Consequently, the center of the formation becomes temporary because if it is fixed, the possibility of achieving Learning III would greatly diminish, and the participants' roles or identities would become gradually stable.

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