

## Complex Systems and How Complex Non-Profits can Harness the Flow of Information

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**Abstract.** Non-profits must continuously adapt themselves to changing circumstances, but they often lack the resources necessary to adapt successfully. This paper proposes a model to help non-profits overcome this challenge. It explains the role of information in the adaptation of complex systems and suggests a process that non-profits can follow to direct the flow of this information. The Information for Innovation Model (IIM) presented in the paper explains how the inflow and outflow of information influences a system's adaptation. A series of steps are then proposed for the design of Communities of Practice (CoP) that can help organisations implement the model. Librarians, trained in information-seeking and focused on increasing their reach beyond the library, can support a non-profit following these steps. This paper contributes to the literature on complexity science by articulating a process that organisations can follow to influence the inflow and outflow of information. This process highlights new roles for both CoPs and librarians within non-profits. This is important because non-profits often lack resources necessary for innovation, and librarians are looking for new ways to extend their reach.

*Keywords:* Innovation; communities of practice; complex adaptive systems; information seeking; experimentation.

### 1. Introduction

The metaphor of a system is often used to explain the survival of complex organisations. As a Complex Adaptive System (CaS), an organisation must continuously bring information in about what is happening around it. It must also develop information to send out into this environment — not merely aware of change but working to influence the direction of change. This flow energizes a process of continuous innovation and adaptation. This conceptual paper presents the Information for Innovation Model (IIM), which depicts how this flow of information can be directed in ways that facilitate successful adaptation. It then proposes a process for implementing the model with non-profits.

Non-profits have a unique role in society, working to address challenges not met adequately by the private or public sector (McDonald, 2007, p. 257). The processes and approaches they develop are aimed at improving the quality or quantity of life (Pol and Ville, 2009). As a result, non-profits often feel the need to be more

innovative than for-profit organisations (Weerawardena and Mort, 2012). Yet, innovation is still a relatively new territory for non-profits (Choi and Choi, 2014). And in spite of a willingness to introduce new services and programs (Jaskyte, 2011), non-profits tend to lack the support structures for knowledge creation that other sectors enjoy (Kong, 2015). The problem addressed by the current paper, then, is that non-profits must continuously adapt themselves to changing circumstances, but they often lack the resources necessary to adapt successfully.

The current paper first asks:

**RQ1:** How does information influence the innovation and adaptation efforts of non-profits?

The IIM is the paper's answer to RQ1. Information from the environment comes through experimentation and information-seeking. Information from the system comes through self-expression and interaction. External and internal information combine to guide the adaptation of the system. It is not sufficient, then, for non-profits to merely bring in outside information. Instead, they must meaningfully add themselves and what they know to the landscape in an attempt to purposefully influence it.

The current paper then asks:

**RQ2:** What steps should a non-profit follow to direct the flow of information between it and the external landscape?

The answer to RQ2 comes through the operationalisation of the IIM. Complexity theory can be hard to explain, and, as a result, it can be hard to translate this theory into practice. To show how non-profits can implement these theories into practice, the current paper develops a framework for Communities of Practice (CoP). Literature supports both the use of CoPs for innovation and their intentional design. The community, domain, and practice of this group support the flow of information depicted in the IIM. The current paper also proposes that librarians work with non-profits to help facilitate the model.

The current paper contributes to the literature on complexity science by articulating a process an organisation can follow to influence the inflow and outflow of information. The process also highlights a new role for CoPs within organisations. Because librarians are ideal facilitators of these processes, non-profits can lean on library resources in their efforts to innovate and adapt. This is important because non-profits often lack the resources necessary for innovation, and librarians are looking for new ways to extend their reach.

## **2. Literature Review**

Information is crucial to the innovation and adaptation of a CaS. These systems are made up of unique people who are continually working on reorganising themselves in accordance with changes in the external landscape (McElroy, 2000). The system's survival is dependent on this adaptation, and this adaptation requires energy.

Information is the energy for this adaptation and, thus, is the source of a system's survival (Boisot and Child, 1999; Stacey, 1996). Information flows from both the landscape and the system itself. Stacey (1996) defined this flow of information as one of the control parameters for a CaS. As a parameter, it can be turned up or down as needed to keep the system at the "edge of chaos" (Stacey, 1996, p. 64). At this edge, the system is neither too comfortable nor too uncomfortable: "So long as it is alive, in a state of chemical and thermodynamic equilibrium (von Bertalanffy, 1968, p. 39). At this edge, the system is also in a "space for creativity" (Stacey, 1996, p. 70). Systems must direct and regulate the flow of information to stay at this edge.

As the term implies, this edge is uncomfortable. There are no clear cause and effect patterns that can be observed (Snowden and Boone, 2007), and forecasting is extremely limited (Plsek and Greenhalgh, 2001). As a result, human systems have a "learnt instinct" to "break down the ambiguity, resolve any paradox, [and] achieve more certainty and agreement" (Plsek and Greenhalgh, 2001). To counter this instinct and survive, the system must facilitate the flow of information between itself and the external landscape. Information from the landscape comes in through experimentation and carefully planned information-seeking. Information from the system itself goes out through the documentation and contribution of unique ideas. The flow of information in both directions is required for successful adaptation. Without external information, the system is ignorant of the changes to which it needs to adapt. Yet, experimentation not carefully designed and guided by internal information would be irrelevant and wasteful. Similarly, information-seeking without the boundaries created by internal information would be overwhelming and counter-productive.

## **2.1. *Landscape information***

The information coming from the landscape tells the system what is happening around it. Thus, it is crucial to its ability to adapt to these changes. This occurs through experimentation and carefully planned information-seeking.

**Experimentation.** Knowledge is developed through action: "The source of new knowledge and knowing lies in the use of knowledge as a tool of knowing within situated interaction with the social and physical world" (Cook and Brown, 1999, p. 54). An open system continuously attempts to increase its fit within the surrounding landscape. These landscapes are rugged (Kaufman, 1995) and in constant flux. Non-profits must fit within shifting socio-political landscapes. The competition in this landscape for donations and public awareness requires the non-profit to be aware of what similar organisations are doing (Rathi *et al.*, 2014). Rather than sit in conference rooms and think of innovative approaches to these challenges, adaptation requires the implementation of ideas in the landscape itself. The system must "search the whole space . . . methodically, trying out each square meter, to find the peak [of fitness]" (Kaufman, 1995, p. 155). Given the size of this landscape and the need to search all of it, ideas must be implemented quickly so that better ideas can be tried.

Complexity science suggests trying several different ideas and approaches and “gradually shifting time and attention towards those things that seem to be working best” (Plsek and Greenhalgh, 2001, p. 627). This requires failure and discontinuity, and it often involves a decline in fitness before any subsequent improvement (Stacey, 1996, p. 83). This necessary decline makes it difficult for these systems to engage with continuous improvement models and is why such models often fail (Ashkenas, 2012). The discovery of new peaks, rather than a process of continuous improvement, is a move away from equilibrium and continuity and toward innovation. The nonlinear experimentation required within an unpredictable environment can lead to substantial changes in learning and behaviour (Rouse, 2008).

**Information-seeking.** An open system also engages in information-seeking to bring in external information. The requirement to seek out external information is self-evident in the very definition of a CaS. A system cannot determine the direction of adaptation, nor can it properly evaluate new ideas, unless it is sufficiently aware of external information. Yet, this information search requires careful planning to avoid common problems that sabotage information-seeking. The first component of this plan is increasing the system’s awareness of hidden assumptions and beliefs that restrict information-seeking. These mental models (Senge, 1990) can sabotage any information-seeking behaviours. Stein (2003) noted, for instance, how easy it is for an organisation to reject external information in favour of existing internal information that feeds its narcissism. The second component is the development of effective search techniques. Cleverley *et al.* (2017) found that information overload in the workplace negatively impacts a person’s ability to effectively search for information, though most are unaware that they are experiencing overload. Not knowing how to effectively utilise information systems can lead to information overload.

The third component involves a series of actions to increase the collective value of information-seeking activities. McNeese and Reddy (2017) found that engaging in information seeking collectively within a group can increase group cognition, defined as the thoughts and knowledge of the group. The development of group cognition has been linked to increased group performance (Cooke *et al.*, 2013). In the study by McNeese and Reddy (2017), group cognition increased as group members kept track of their individual searches and shared this with the group, and as they regularly checked in with the group after individual searches. It also increased as the group searched together, reading through several different web pages together. Innovation and adaptation within a non-profit, then, requires that members seek information as a group rather than as individuals.

## 2.2. System information

The system also sends information about itself out into the landscape. This internal information shapes the ideas the system experiments with, and it determines what the system considers relevant and useful in an information search. It is through the cultivation and expression of unique ideas that a system is able to exert pressure on

the landscape toward certain changes. A system does this through the self-expression of unique agents within the system.

**Self-expression.** What the system offers to the external landscape is a collection of its experiences, opinions, and ideas. A system is comprised of individual agents with unique interests, histories, and experiences (Mennin, 2007). Grimm *et al.* (2005) defined these agents by alluding to James Bond: “He has a clear goal, he is autonomous in his decisions about achieving the goal, and he adapts these decisions to his rapidly changing situation” (p. 987). An open system allows these agents to act in accordance with rules they create from beliefs, mental models, and social pressures — many of which are instinctual (Plesk and Greenhalgh, 2001). Stacey (1996) diversity control parameter suggested that systems can only reach the edge of chaos — and innovation — if there is an adequate level of distinguishing characteristics and non-conformity among members.

The IIM fails if an organisation does not have diverse people; however, there are several additional steps these organisations that would need to take to increase diversity before engaging with the IIM. Yet, having diverse people is not equivalent to hearing diverse ideas. An organisation may have diverse people but never realise the potential of that diversity because people do not feel comfortable contributing to what makes them unique. Several additional factors contribute to this that are out of the scope of the IIM. The focus of the IIM is on developing a structure for group conversation that enables diverse self-expression.

This structure addresses the ease with which systems fall victim to high levels of conformity, given the difficulties associated with expressing unique ideas in a group setting. Pooling unique information increases the quality of decision-making (Larson *et al.*, 1998; Mojzisch and Schulz-Hardt, 2010). Yet, people have a tendency to contribute only the information that others in a group also know, rather than the information that is unique to them (Larson *et al.*, 1998). Several explanations have been offered for a lack of unique idea sharing, including an implicit preference for unoriginal ideas (Blair and Mumford, 2007), self-censorship out of fear of being ridiculed for unique ideas (Nemeth, 1986), and fear that ideas shared in highly competitive environments would be misused (Razmerita *et al.*, 2016). Larson *et al.* (1998) attributed a lack of knowledge sharing to group structure: “Unstructured group discussion is a less-than-optimal means of pooling members’ unshared information and why groups often have difficulty accessing the very information that such discussion is intended to elicit” (Larson *et al.*, 1998, p. 104). Increased self-expression within a non-profit, then, requires structured conversation.

Dewey’s Productive Inquiry (PI) outlines one way to structure these interactions to ensure the outcome leads to system change. PI happens when system agents commit to “actively pursuing a problem . . . to seek an answer” (Cook and Brown, 1999, p. 62). The result of this inquiry-inspired search is “the production of knowledge” (Cook and Brown, 1999, p. 62). Because innovation requires “identifying and questioning assumptions” (Beckman and Barry, 2007, p. 36), it follows that it requires PI. This does not always occur naturally, however. So,

Freeburg (2015) — in his study of openness to inquiry about beliefs in religious groups — outlined the characteristics of a culture that values PI. Hallmarks of this culture include a looser attachment to beliefs, an acknowledgment of the imperfect nature and ambiguity of the information that supported these beliefs, an intentional external positioning, a desire to increase relevancy, willingness to engage in debate, and a celebration of diversity (Freeburg, 2015). Interaction within a non-profit, then, requires mutually agreed-upon guidelines for interaction. A shared goal regarding the external impact the group wants to have can help to guide these interactions toward these requirements. This helps to ensure that unique insights are collected and pooled to inform experimentation and information-seeking.

### 2.3. The model

This flow of information from both the system and the external landscape is depicted in Fig. 1. The system is made-up of unique agents. This uniqueness must be sent outward to direct experimentation and information-seeking. Without this outward flow of information, the system has no boundaries and focus. The system risks information overload and haphazard idea implementation. Because the flow of information from these unique agents is not guaranteed, it must be energised through self-expression. This self-expression comes through (a) documentation and contribution of unique information, and (b) structured group conversation. The landscape is made up of changing realities and challenges. Information about these changes must flow inward and combine with the self-expression of agents within the system. If it does not, self-expression lacks direction. The system risks moving out-of-alignment with the landscape. Because the flow of information from these unique agents is not guaranteed, it must be energised through experimentation and information-seeking. These activities must be (a) carefully planned, (b) done collaboratively, and (c) quickly implemented. In this way, internal information focuses the

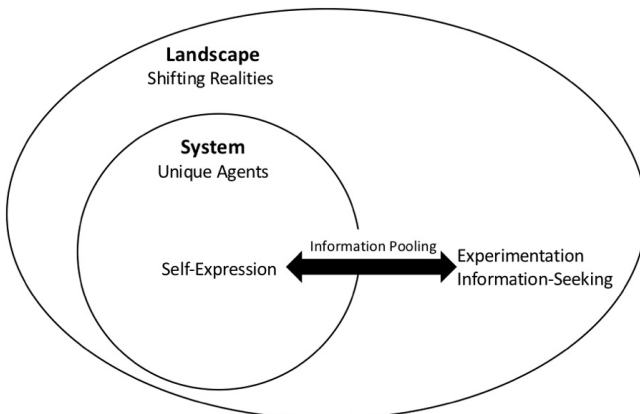


Fig. 1. The information for innovation model.

flow of external information, and external information directs the flow of internal information.

### **3. Operationalising the IIM**

A non-profit following this model identifies other non-profits with a similar focus, bringing them together as a CoP to develop new solutions and approaches for the challenges they face. The collaborative nature of non-profits increases the likelihood that this approach will be successful. [Rathi et al. \(2014\)](#) found, for instance, that collaboration can be so strong among different non-profits that they appear to be different departments within a unified global organisation. This was articulated by a hospital VP in [McDonald \(2007\)](#) study: “I’m not in a competitive business. I don’t keep secrets from them, nor do they keep them from me” (p. 264). After first defining CoPs, the following section outlines specific steps for non-profits that use the model.

#### **3.1. *Communities of practice***

CoPs are “groups of people who share a concern . . . and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” ([Wenger et al., 2002](#), p. 4). They are well-suited to the goal of the IIM, as they have been uniquely tied to knowledge creation and sharing ([Saint-Onge and Wallace, 2003/2015](#)). The free-flowing and creative sharing of experiences in these groups “foster[s] new approaches to problems” ([Wenger and Snyder, 2000](#), pp. 139–140). They can “serve as a mechanism for enhancing innovative capabilities” ([Pattinson et al., 2016](#), p. 511). Members of a CoP both work with existing tools and — when those fail — create new ones ([Brown and Duguid, 1991](#)). [Aljuwaiber \(2016\)](#) review of the literature highlighted a CoP’s role in improved problem solving, learning, knowledge creation and sharing, and increased awareness of new ideas. They have been used to promote new and successful strategies for global sustainability ([Mohtar and Lawford, 2016](#)), to develop and support new ways to provide compassionate care in the healthcare field ([Parsons et al., 2019](#)), and to develop new farming techniques in developing countries ([Dolinska and d’Aquino, 2016](#)). They are not always successful, though, and require access to diverse knowledge sources ([Dolinska and d’Aquino, 2016](#)), the power to affect change ([Cox, 2005](#)), and organisational support through facilitation ([Pattinson et al., 2016](#)).

[Wenger et al. \(2002\)](#) outlined a structure for CoPs, including a domain, community, and practice. The domain articulates what the group is about, and “gives meaning to their actions” ([Wenger et al., 2002](#), p. 28). It comes from the shared expertise and experience of group members. The community is the trust and relationships that develop through group processes, governance structures, and mutually agreed-upon rules for conversation. It is the group’s “social fabric of learning” ([Wenger et al., 2002](#), p. 29). Practice includes the things members do together, which includes the gathering and sharing of information, and the experimentation of

innovative ideas. It is what helps the group “proceed efficiently in dealing with its domain” (Wenger *et al.*, 2002, p. 29).

### 3.2. Steps for the community of practice

The CoP will not naturally engage in the necessary components of the model. Here, a series of steps are provided to guide the actions of the CoP. Although Harvey *et al.* (2013) suggested that CoPs cannot be designed and must emerge spontaneously, their case study was conducted within a professional bureaucracy whose insistence on clear rules is likely not present within non-profits. Many of the problems faced by non-profits have no such rules. Also, this intentional design of CoPs is supported by existing literature: “The extant literature provides evidence which demonstrates that CoPs can be intentionally deployed, which is contrary to the common view that CoPs need to emerge naturally” (Agrawal and Joshi, 2011, p. 9). Even Wenger *et al.* (2002) supported this design as long as it is done with a light hand.

These steps are not offered here as a comprehensive list of actions and considerations, however. Instead, they are provided as a starting point to help operationalise the IIM. The steps are informed by both the IIM and the framework for CoPs. Table 1 outlines how these steps fit both the IIM and the CoP framework. The outflow of information from the system to the landscape gives shape to experimentation and information-seeking. It requires searching for diverse viewpoints, contributing unique ideas, avoiding conformity of opinions, PI, an openness for debate, and a loose attachment to non-core beliefs. To achieve this, the CoP must be intentional in the design of its *community* and *domain*. This includes its shared goals, members’ roles, rules for interaction, and the shared topics of interest. The inflow of information from the landscape into the system requires experimentation and information-seeking. To engage in both actions successfully, the CoP must be intentional in the design of its *practice*. This includes how it finds existing information, documents unique information, pools existing and unique information, develops novel solutions, and quickly implements ideas in practice. These suggested steps should be adjusted and modified to fit different contexts, with special attention paid to power dynamics and socio-political and socio-cultural nuance.

Table 1. The alignment of suggested steps with the CoP framework and IIM.

Step	CoP framework	Source of Information in IIM
1: Goal	Community	From System
2: Roles	Community	From System
3: Rules	Community	From System
4: Topics	Domain	From System
5: Focus	Domain	From System
6: Information-seeking	Practice	From Landscape
7: Document Unique	Practice	From System
8: Pool Information	Practice	Both System and Landscape
9: Implementation	Practice	From Landscape



**Step 1: Declare a shared goal and identity.** A CoP's community should clearly declare why it exists. This is less about what the group does or the information it works with, and more its intent and mission. To do this, the CoP can articulate a superordinate identity. This is a shared identity that all members can claim while still retaining what keeps them unique (Gurin and Nagda, 2006). It provides a "sense of belonging to a social aggregate" (Kane *et al.*, 2005, p. 57), and people are more receptive to the knowledge of someone else when they share this identity.

**Step 2: Establish clear roles.** Nichani (2001) outlined several roles for CoP members, including *salespeople* who try and persuade people to try new things. Saint-Onge and Wallace (2003/2015) outlined a role for *summararians* who regularly summarise the group's discussions. Because the contribution of unique information is rare (Larson *et al.*, 1998), the group must be intentional about asking for it. This can be supported by identifying clear roles for members who will regularly ask for the opinion of others during conversation. To avoid conformity, a group member can take on the role of *devil's advocate* to question group assumptions. This role also serves to increase PI by asking questions that initiate a search for an answer.

**Step 3: Establish clear rules.** The group should outline the format and outcome of previous group discussions they have participated in, noting what did and did not work. The goal of this step is to articulate and attempt to overcome "barriers to relationships" (Wenger *et al.*, 2002, p. 34). Kremer *et al.* (2019) outlined recommendations for fostering knowledge sharing in intentionally structured groups. Among other actions, these groups adopt norms and fair practices to encourage trust, promote extroversion, directly ask members to add their valuable contributions, encourage respectful sharing, practice non-defensive listening (Kremer *et al.*, 2019). This helps to increase PI and the vulnerability needed to resurface mental models (Senge, 1990).

**Step 4: Map Topics.** The domain of a CoP articulates "what matters to [the] community" (Wenger *et al.*, 2002, p. 30). This puts boundaries around the group's information-seeking to avoid information overload. The group first identifies the knowledge required to fulfill its shared mission. They map the activities, projects, and products associated with this mission and the knowledge necessary to develop or carry them out. Similar knowledge maps have been used as decision support tools in other contexts (Ermine *et al.*, 2006). They then prioritise the areas in need of innovation.

**Step 5: Narrow focus.** In a face-to-face (F2F) meeting, CoP members identify a specific topic from their knowledge map to focus on. The group outlines its information-seeking plan and discusses potential goals related to this topic. The group also documents existing assumptions and mental models related to this topic and how they will avoid being restrained by them.

**Step 6: Find information.** Between F2F meetings, CoP members find existing information related to the topic. They rely heavily on the resources of local libraries, for both sources of information and techniques to search through this information.

This helps them avoid information overload. Members use collaboration software, e.g. Slack, to share what they are searching for and what they found. This increases the collective nature of information-seeking.

**Step 7: Document unique information.** Between F2F meetings, members maintain a personal journal in which they document experiences, expertise, and ideas related to the topic. Members are more likely to contribute unique information in a discussion if they are prepared to do so. Because the CoP is defined by the interdependency of members' knowledge (Wenger, 1998), the regular documentation of this knowledge is necessary.

**Step 8: Pool information to identify a solution.** In the IIM, innovation is a product of internal information that is pooled with existing external information. So, in a F2F meeting, CoP members share what they found from information-seeking and what they documented in their journal. As members discuss existing information, they learn about the external landscape. As they contribute unique insights, they increase the effectiveness of this discussion (Larson *et al.*, 1998). The goal of this meeting is to identify an actionable solution or approach that addresses a specific challenge within the topic.

**Step 9: Quickly implement the idea.** Having outlined an actionable idea, the CoP then quickly implements this idea. It is important that the group not try to *perfect* this idea. The desire to do so comes out of the craving for simplicity and predictable outcomes (Plsek and Greenhalgh, 2001), which is not possible in a complex environment (Stacey, 1996). The goal of this implementation is to receive feedback from the landscape and learn more about the layout of its rugged terrain (Kaufman, 1995). The goal is not, then, to *fix* this landscape.

This is a continuous process of trying to understand the complex environment in which the non-profits work. Because ideas must be implemented quickly, this process should take no longer than one month. The CoP then outlines its next focus, which could be a continuation of the previous topic, a revision of the previous topic, or a completely new topic. The feedback from the environment is combined with the pooled information, and this becomes a potential source in subsequent information-seeking.

### 3.3. Methodology for validating the model

Future validation of the IIM comes as researchers facilitate this process with non-profits. As facilitators, they both participate in the CoP's process and observe it. While the IIM outlines broad goals, the researcher and non-profit members work together to identify specific goals, pool information, and implement ideas. Librarians are uniquely situated to do this. Researchers in Library and Information Science (LIS) have long studied the identification and exploration of the need for information and the subsequent search for and use of that information — termed information behaviour (Wilson, 1999). And librarians are trained in evidence-based approaches to information-seeking. But the role of librarians in the IIM is not limited

to information-seeking. The role of the librarian in experimentation and self-expression is outlined in Lankes' (2011) call for librarians to adopt as their mission: "To improve society through facilitating knowledge creation in their communities" (p. 15).

Participatory qualitative research can best account for this co-production of knowledge between the researcher and CoP members (Bergold and Thomas, 2012). The researcher tries to understand the theories driving the IIM as these theories are operationalised in practice through real interventions (Argyris and Schon, 1991). The researcher has the dual aim of helping the non-profits achieve their stated objectives while also validating and revising the model. This should begin with an open conversation about what the researcher and participants stand to gain, as the former typically benefits the most in this type of research (Minkler, 2004). Non-profit workers are underpaid and overworked, and — although the overall resource commitment is low — the IIM does ask them to devote significant time. The value proposition for both parties should be clear.

There is no one best method for this type of inquiry (Bergold and Thomas, 2012), but focus groups (FGs) and participant observation fit well. FGs are useful for soliciting the socially constructed opinions of participants (Jakobsen, 2012). Participate observation grounds the researcher *on-the-scene*, enables the collection of higher quality data, and improves the analysis of this data (Musante and DeWalt, 2011, p. 10). Participant observation relies heavily on field notes, which allow the researcher to "fix" the reality they experienced to re-read and analyse it (Emerson *et al.*, 2001, p. 365).

The researcher, then, helps to connect various non-profits and set up the CoP. They then lightly guide the group according to the considerations previously outlined in the CoP steps. They may remind the group of these steps, help connect them to librarians, initiate discussion, etc. As the group establishes a routine, the researcher moves further away from active participation. Field notes are taken at group meetings, during idea implementation, and after observing virtual interactions. The researcher pays special attention to:

- The speed of idea implementation and associated member comfort.
- The efficiency and planning of information-seeking.
- The collective nature of information-seeking.
- The comfort of members to disagree, contribute new ideas, and share from their journals.

Periodically, the researcher also moderates an FG discussion with members to collect data about the process and its perceived value to members. These FGs follow McDonald (2007) overview of non-profit innovation, which includes the extent to which:

- The mission is shared by the group.
- Ideas are given an equal chance of success and are evaluated fairly.

- The mission of the CoP — and the non-profits they represent — directs decisions about which ideas are implemented.
- The non-profits represented by the CoP adopt these innovations.
- The CoP is proactively addressing change.

#### 4. Conclusion

In answering RQ1, the current paper outlined how the information flow of complex systems impacts innovation and adaptation. According to the IIM, information enters the system from the external landscape through experimentation and carefully planned information-seeking. Information is also created within the system as agents document and contribute what makes them unique. The flow of information in both directions is necessary for the successful adaptation of the system. This model places special emphasis on internal information, noting the importance of created spaces within organisations for self-expression. Though these spaces may be seen as inefficient, they represent a vital part of an organisation's successful adaptation.

In answering RQ2, the current paper outlined a series of steps for the design of CoPs that foster innovation and adaptation. The community, domain, and practice of a CoP play unique roles in the flow of information depicted in the IIM. Using these steps as a starting point, organisations can use CoPs to ensure they both keep up with change and direct this change. This is important for non-profits, as these non-profits are focused on creating change rather than merely responding to change.

Non-profits occupy a unique space in society. With limited resources, they address problems that other sectors ignore. A growing body of literature is focused on helping non-profits fulfill their mission, but complexity theory is often too vague and esoteric for non-profits to apply to their work. The current paper attempted to distill these theories into a model that depicts the flow of information in and out of the non-profit. It also provided steps that non-profits can follow to guide this flow. Through the IIM, non-profits can better *understand* the landscape around them. Through the steps of the IIM, non-profits can *change* this landscape.

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