Chapter 6
Encouraging Open Community Innovation: *Outils-Réseaux*'s Modular Approach

Lorna Heaton, Florence Millerand, David Delon, Florian Schmitt, Laurent Marseault, and Jessica Deschamps

Abstract Increasingly, individuals, groups and communities are participating actively in the process of technological innovation. Indeed, the novelty of Web 2.0 technologies and platforms appears to lie in the fact that the user has the possibility to produce—and not just consult—a vast array of content and tools. Users are more and more aware of their capacity for making and changing technologies, but participation does not happen automatically for most people. This chapter is a case study of *Outils-Réseaux*, a French group whose mission is to encourage the development and use of collaborative tools by associative movements. Drawing on interviews and an analysis of the content of various Wiki pages, we reflect on how *Outils-Réseaux*'s actions and approach participate in community innovation, in which the community itself is an essential element of the innovation. We explore the coevolution of both technical infrastructure (tools for collaboration) and the community, and show how *Outils-Réseaux* mediates between the (social) world of users and the technical world of software developers. We place particular emphasis on the modularity of the group's approach to illustrate how it helps reconfigure boundaries for innovation and collaboration. First, we outline *Outils-Réseaux*'s general approach and several guiding principles. We then describe several "success stories" that illustrate key elements of the approach: simplicity, modularity, user-driven innovation. We conclude with reflections on emergent, community innovation and relate our experiences to academic literature on open, collaborative innovation.

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Table 6.1 Comparison of three success stories

	Saga pedo inquiry	**Garrigues debates**	**"AnimaCoop" course**
Tool(s) used	Wikini	Conceptual map	A toolbox of collaborative tools Wikini collaborative workspaces
Type of collaboration	Distributed, asynchronous	Face-to-face, real time	Both face-to-face and distant
Role of Outils-Réseaux	Development and installation of a collaborative tool	Guiding users' experience, followed by mini-training sessions	Presentation of tools Facilitating discussions Providing skeleton of workspace to be fleshed out by participants
Users' actions	Experiencing and experimenting	Experiencing Transposing the experience to reuse in other contexts	Experiencing and experimenting Transfer between projects tools used in new combinations
O-R/user interaction	Interaction with end-users mediated by the Wikini interface	Meeting facilitation, presentation of the collaborative tool	Workshops, online presence for support to participants
Outcomes	• Larger dataset of observations • Greater environmental awareness • Model for subsequent inquiries (20 underway) • Greater possibilities for individual participation and development of a shared sense of purpose	• Appreciation of other points of view • Mobilisation around the issue • Community building	• Users/trainees become designers • Multiplier effect
Key points	Simple tools enlarge the range of possibilities for individual participation	Demand-driven approach	• Modular approach assembling existing applications into a customised whole • Users are empowered to customise as their situation changes

6.1 Introduction

Open Innovation (Chesbrough 2003) is based on the premise that knowledge is widely distributed and often collaboratively produced. In order to innovate, it thus becomes important to actively scout for and use the discoveries of others. Not only

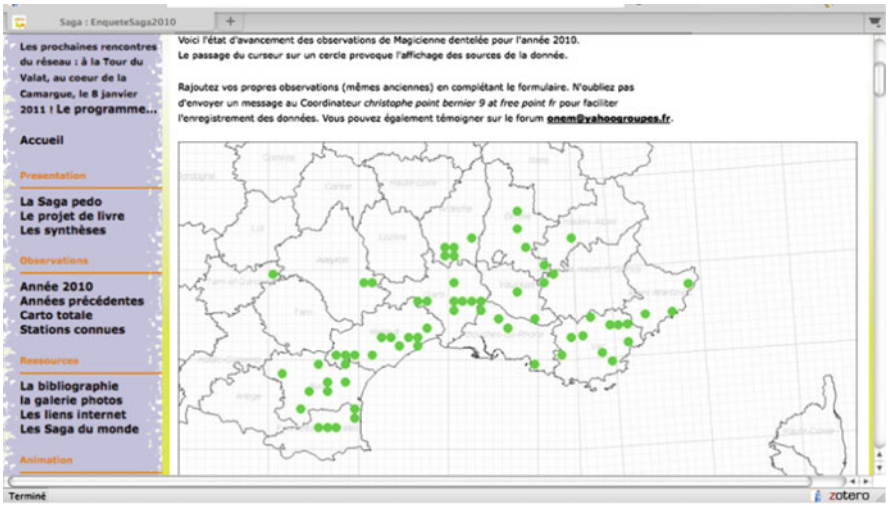

Fig. 6.1 Map of Saga observations in 2010

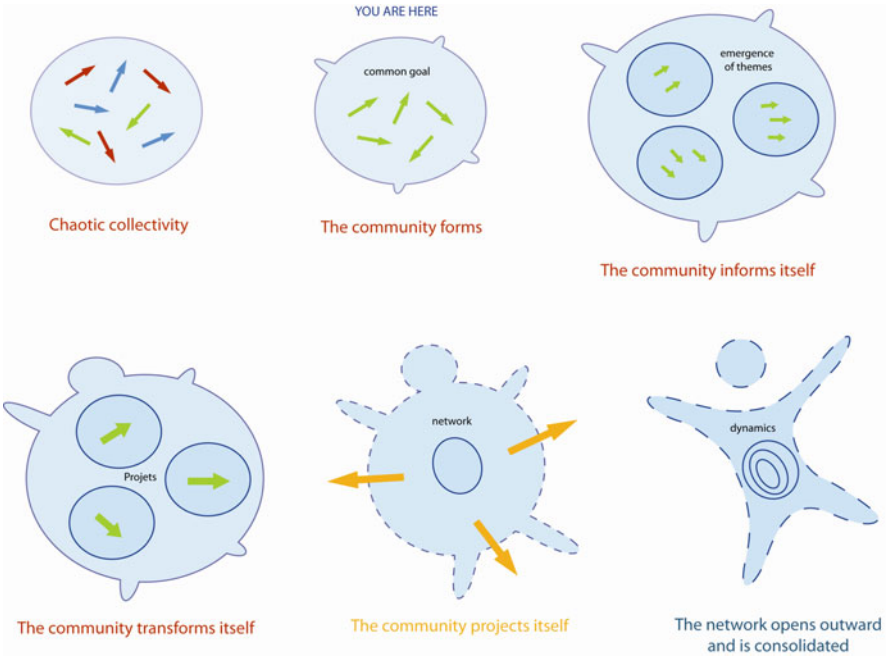

Fig. 6.2 Stages in community development

can knowledge be shared openly and freely without cost, it actually benefits from being passed around since users continually improve on it. The idea that copying, reusing and transferring collaborative tools from one situation to another will make

them more robust is at the heart of the actions of Outils-Réseaux. This chapter shows how this philosophy, coupled with sustained attention to interaction with their user clients, enables the groups they work with to attract the participation of a broad community of contributors and to sustain that participation over time. Like a ripple effect with its ever-widening circles, we use three examples to show how Outils-Réseaux plants the seeds of innovation that communities then take up and sustain.

Following an ethnographic approach, we conducted 11 interviews with *Outils-Réseaux* staff and participants in the three success stories described below. We did a content analysis of various Wiki pages, documents and tools, and engaged in punctual participant observations (e.g. attending meetings) in order to understand *Outils-Réseaux*'s actions and approach to open community innovation. The association places strong emphasis on the need for reflexivity and critical reflection upon its own practices, thus four co-authors of this chapter are also members of *Outils-Réseaux*.

6.2 Outils-Réseaux: Activities and Approach

The French association *Outils-Réseaux* (http://outils-reseaux.org) began in 2003 in response to increasing demand for collaborative network tools from scientific and non-scientific communities in the fields of ecology and the environment. In 2010, *Outils-Réseaux* was at the centre of a constellation of innovative collaborative community projects, ranging from e-government projects to networks of artists to nanotechnologies.

The association has offices in Montpellier, France, and its mission is to initiate and accompany Internet-based cooperation, primarily not-for-profit associations. The five staff members provide software development services and technical support, but also training sessions on the use of collaborative tools. Most of its client organisations have been in the fields of ecology and the environment.

Drawing on elements of participatory design (Schuler and Namioka 2003), agile programming (Beck 2000; Dittrich 2002), and active pedagogy from environmental education (Perrenoud 1983), the *Outils-Réseaux* approach to development has several particularities. First and foremost, it focuses on accompanying the groups it works with, rather than simply providing technical solutions. Use of collaborative tools by a group is viewed as secondary, and subsequent, to a group's experience with cooperation.

The team is guided by its client associations' needs and group dynamics throughout the development and appropriation process. The goal is twofold: on the one hand, to help people imagine the field of possibilities and enlarge this inventory, and on the other, to put the accent on cooperation. Another defining characteristic of the *Outils-Réseaux* way is its accent on accessibility and simplicity. The team explicitly gears its actions to the "lowest common denominator" in any group, so that everyone can participate. This implies proposing the simplest possible configurations of collaborative tools and may involve masking certain functionalities, at least temporarily. Being attentive to clients' capabilities and their evolution also requires a gradual approach to increasing technical skill, as well as to learning how to work together. *Outils-*

Réseaux will typically begin by introducing a few, simple collaborative tools, and will propose more complex tools only once the people they are working with have become comfortable with the first ones. They also insist on dissociating the experience of cooperation from that of learning how to use computer applications. Thus, they will ensure that the groups they accompany acquire "small, irreversible experiences of cooperation", independently of the use of collaborative tools.

Outils-Réseaux operates according to the logic of assembling a variety of tools into custom packages that best suit the needs of particular groups. This modular "LEGO approach" allows them to customise their offer. From one group to another, *Outils-Réseaux* draws from the same general toolkit of primarily, but not exclusively, free and open source tools: wiki spaces, templates, mapping tools, shared agenda, etc. A bare-bones Wiki, called a Wikini, is used as the integrating mechanism to hold everything together. The Wikini is integrated with the Bazaar (the name is a reference to Raymond's (1999) work on the Cathedral and Bazaar), an easy-to-use relational database manager that enables management of histories and facilitates linking of resources across the Web, and thus scalability. Finally, despite this pick-and-choose approach, *Outils-Réseaux* insists on a graphic identity and the integration of the various modules, so that users are not immediately conscious of switching between applications. Use and user experience become the primary considerations.

Practical Tip

A clear graphic identity will ensure the fluidity and coherence between various modules or applications and limit confusion by users. An attractive interface will also help motivate users to want to use and explore the various parts of the site.

In short, *Outils-Réseaux* works from a *logic of attention* rather than a *logic of intention*. Staff propose conceptual and technical tools in ways that promote sustainability: starting small and simple, encouraging their clients to reflect on their practices and to ask questions, enlarging the inventory of possibilities gradually, facilitating use and appropriation.

6.3 Three "Success Stories"

This section contains examples of *Outils-Réseaux*'s actions in three different projects. Each of them highlights a particular aspect of the organisation's approach: keeping things simple, dissociating the experience of cooperation from learning about collaborative tools and modularity.

6.3.1 Focus on Simplicity: Observing the Cricket Saga

The Observatoire Naturaliste des Ecosystèmes Méditerranéens (ONEM) is a highly decentralised non-profit association based on the principles of open access and collective action. Founded in 2003 with the goal of providing a space in which to bring together anyone and everyone interested in the Mediterranean environment, ONEM's first concrete action (in 2004) was to launch an inquiry and call for observations of the *Saga pedo,* a very large, carnivorous cricket, also known as the predatory bush cricket. This insect is on the French, European and IUCN lists of threatened species, but largely unknown in France (a 2003 atlas edited by the French National Natural History Museum (MNHN) had reported only 72 sightings in France). ONEM printed and distributed 4,000 leaflets and established an Internet site for collecting and sharing observations (http://saga.onem-france.org). In just a year, the number of observations reported increased fivefold. Still active in 2010, the inquiry has gathered over 1,000 observations from more than 500 different contributors, principally in the French Mediterranean region.

The project is run on a voluntary basis, with a coordinator and a scientific and technical committee of about ten people. It requires very little money and a limited amount of technical know-how by contributors. *Outils-Réseaux* helped ONEM establish the Internet site, which is based on a Wikini with a cartography module. They also organised a database manager and a system for managing the photo gallery. The inquiry also uses email and a Yahoo discussion list.

Beyond the interest of the data it generated, which has been integrated into several biodiversity inventories, ONEM's *Saga* inquiry has been important in raising citizens' awareness of their natural surroundings. It allows them to participate directly in an interactive science program (dynamic mapping and database on a wiki platform). The system of data editing allows ongoing, permanent visualisation of all the information transmitted by contributors. Users write directly on the page and they see their contribution immediately, both in textual form and transposed onto a map. Data validation is thus permanent and collective: any user or participant can question information that he or she considers doubtful by adding a commentary to the observation or by contacting the inquiry's coordinator. It takes place upstream of traditional scientific validation of data (steering committee or validation criteria specific to the species).

The *Saga* inquiry has served as a model for other inquiries by ONEM (about 20 inquiries on various species of insect, animal or plant are underway). This innovative manner of collecting and validating data has proved to be a powerful enabling mechanism. While citizen science sites are becoming increasingly popular, the vast majority of them ask citizens to contribute observations that are validated by a committee before being accepted and posted. The *Saga* inquiry shows how putting technologies in the hands of ordinary people enlarges the range of possibilities for individual participation. Collaborative technologies can also help develop a shared sense of purpose and even a sense of community, as the next success story illustrates.

6.3.2 *Small Irreversible Experiences of Cooperation: "Where Have All the Garrigues Gone?"*

The garrigues in the south of France near Nîmes and Montpellier is a region of hundreds of thousands of hectares of arid land threatened by urban expansion, the abandonment of agriculture and fire. Despite a high degree of biodiversity and fantastic scenery, there has been little discussion about how to guarantee a future for this region. The Ecologistes de l'Euzière, an environmental education association, decided to raise this question through an itinerant exhibition coupled with field expeditions and a series of public debates.

In organising these debates on "Where have all the garrigues gone?" the facilitators sought a way to go beyond traditional oppositions between hunters and ecologists, newcomers to the region and natives, scientists and poets. *Outils-Réseaux* suggested that they record the comments of all participants in real time, using FreePlane to note them in mind maps (heuristic maps) and displaying them for everyone to see on a large screen. Over 500 people took part in more than 80 debates.

After a few minutes of initial surprise, a number of "map effects" started to take form:

- Ideas were not repeated: they were now visible on screen and formed a sort of collective memory of what had been said.
- Seen side by side, oppositions were highlighted.
- The branches of the map that could be opened up or collapsed allowed participants to focus on one or another aspect of the debate, without fear of losing the rest of the larger picture.
- Regular syntheses by looking back over the emerging collectively produced map enabled the debates to progress.
- As concepts were organised, arguments and problems became visible.
- With everyone's positions and ideas visible at a glance to all, groups started working on what unites them, rather than focusing on their differences.

At the end of a debate, participants were often proud of what they had produced together: "we did a good job", "finally, a productive debate", "we have some pretty good ideas". They had undergone a "small irreversible experience of cooperation". They had thought in a different way, collectively, and had learned something without initially realising it. What is more, they had appreciated the experience and wanted to repeat it.

Then came the inevitable question: what tool was it that enabled the facilitators to take notes in spider form like that, and could they learn to use it? It transpired that:

- The mayor would like to use it in the municipal council meetings
- The association president saw its potential for making association meetings more dynamic
- Some would like to use it for brainstorming
- Others saw its possibilities for organising a more complex project

The facilitators were waiting for this. With the advantages of a collaborative approach accepted, and the recognition that expertise is not always individual, participants were ready to learn how to repeat the experience in other situations. It was the facilitators' cue to provide a mini-training session on four basic functions of the FreePlane software that would let participants start using this free, open source software.

Practical Tip

Whet the appetite of the people you want to train. Start simply and wait for participants to ask for more. They will be more motivated to learn if they have not only seen what can be done with a particular tool, but are also convinced of its usefulness to them.

The garrigues debates clearly illustrate *Outils-Réseaux*'s on-demand approach and its sensitivity to group dynamics.

6.3.3 Modularity: Networking Local Pockets of Innovation

In 2010, *Outils-Réseaux* prepared an "education in action" programme on facilitating collaborative projects. Funded primarily by the French government, the programme was first delivered in Brest[1] to a group of 12 participants, all of whom were working as community organisers in local communities or with special groups such as youth or various social movements. Many were already exploring computer applications on their own and were seeking to consolidate or acquire more systematic knowledge of collaborative applications, particularly how these tools could be brought to bear in their work. Beyond their interest in collaboration and collaborative tools, one of the prerequisites for participation was to have a specific project in mind that would serve as a test bed for applying the course content.

The programme proposed an original delivery format—a combination of periodic two-day face-to-face workshops, online support and time and space for experimentation, and was held together with a Wiki platform. In terms of content, the course was designed so that participants would learn about cooperation and collaboration, with or without collaborative tools. They experienced all the stages in the life cycle of a network as they themselves worked together over several

[1] Brest is well known for its focus on local capacity building, project-based organisation of community development initiatives and an extended network of multimedia and IT animators and facilitators.

months. They learned about collaborative tools by trying to collaborate in real situations using them. In particular, they learned about:

- Forming the community: individual presentations and definition of what brings them together—in this case facilitating collaborative projects
- Informing the community: exchanges around each other's projects, leading to the emergence of common experiences and problems
- Transforming the community: working collaboratively, either in small groups or as one group
- Making the community visible: diffusing the results of cooperative work outside the community
- Consolidating community: evaluating and reflecting on how to keep the dynamics going and on opening it to others

The first two-day workshop took participants through stages 1 and 2 as they explored notions of cooperation, making each other's and the group's actions visible, as well as several collaborative tools. Participants then organised themselves into four small groups. These groups worked together on common themes using various collaborative tools for about 3 h per week with online support as required from the facilitators. Each participant also spent several hours each week transposing and testing the week's content in his or her particular project. This experience nourished the group discussions and the negotiation of shared understandings. In working together to try out different tools and apply various concepts, and in sharing their experiences in their respective individual projects, participants tested their assumptions and thought through the different ways that a given collaborative application might help a group. Sharing of experiences served to multiply tacit knowledge across projects as well as to anchor it more deeply. Each group posted a weekly progress report detailing what they had explored, how they had organised themselves and any difficulties they had experienced.

Practical Tip

Groups working together for the first time should ideally meet face-to-face. They need time to get to know each other and feel comfortable. This group feeling can then be carried over into online environments.

The course was held together by an online group space, organised with a Wikini. The AnimaCoop space (http://www.animacoop.net) integrated the course components and resources: content, calendar, instructions, interns' and facilitators' self-presentations, etc., all of which were visible to the entire group. There were also links to various tools and examples of their use in other situations, and spaces that were *constructed collectively* during the course: a concept box (for developing a common understanding of key concepts), jargon box (glossary), idea box, question box (FAQ), etc. The site was thus organised according to principles of

transparency (anyone could view any page of either the standard course content or the production of other groups and participants), modularity and flattened hierarchy. Each group also developed a workspace that was accessible through the Wikini and modifiable by anyone. Particular attention was paid to supporting and recording the group process (posting meeting notes taken on Etherpad, heuristic maps or the collaborative construction of shared vocabularies, for example). Thus, in addition to learning about cooperation, the participants were also learning how to use collaborative tools effectively.

Participants' individual projects were a major component of the programme. Through the AnimaCoop site, *Outils-Réseaux* installed some simple collaborative tools—or links to tools—in order to encourage experimentation. Participants were able to select the most relevant or most interesting and combine them in various ways to fit the needs of their specific projects. This allowed them to apply what they were learning in the programme to their projects immediately, and to be able to ask the training staff questions as they arose. They were thus involved in action at the same time as they were learning concepts, thus facilitating the consolidation of the experience. This back and forth between action and reflection is a key element of active pedagogy, which stresses autonomy, reflexivity and collaboration.

Modularity is in evidence in the AnimaCoop training at several levels. First, there is the modularity of combinations of simple tools that formed both the course content and its delivery method. Second, there is the modularity and scaffolding as participants experimented with different collaborative tools in their own projects. *Outils-Réseaux*'s modular approach accentuates the malleability of collaborative ICT spaces and highlights the active role of individuals, groups and communities in shaping innovation to fit their needs and according to their constraints. In assembling tools to meet the needs of their individual projects, AnimaCoop participants became designers in their own right. This supports the observation that with Web 2.0 platforms and collaborative tools in particular, the conventional distinction between designers and users tends to dissolve (Mackay et al. 2000; Millerand and Baker 2010).

Practical Tip

A modular approach allows for multiple combinations that can be adjusted to fit the needs of individual situations.

Finally, the AnimaCoop training reflects a modular structure at a social level. Participants produced local pockets of innovation. In addition to providing an opportunity for group facilitators to reflect on their practices and explore collaborative tools, AnimaCoop was designed to take advantage of the multiplicity of locally initiated projects in the municipality of Brest. It explicitly brought these individuals together and provided a space for them to meet and discuss common interests. This is in keeping with the City of Brest's strategy of creating synergies between projects and individuals. Local pockets of innovation are the starting point, but there is a multiplier effect in networking them.

6.4 Cross-Case Analysis

Our three success stories have several things in common. First, they all illustrate the active role of ordinary users in appropriating the collaborative tools that are proposed. Despite their expertise in software development, *Outils-Réseaux* has made a conscious choice to strive for simplicity in the tools it proposes. Users are viewed as active participants who are trying to accomplish something, and the tools are just that—tools. They are there to serve a purpose, whether it is for entering naturalist observations, encouraging discussion or developing a feeling of belonging in a group. The tools should not get in the way. Keeping things as simple as possible has two important implications for open innovation. First, it enlarges the basin of potential contributors to innovation by minimising the technical challenges they may face. Second, users who feel in control of the platforms and tools will also feel capable. Feelings of empowerment should encourage adhesion to community projects at the same time that the range of possibilities for individual participation is enlarged.

In the garrigues and AnimaCoop examples, we observe *Outils-Réseaux*'s keen attention to group dynamics and its desire to be led by the group's needs and rhythm. This runs counter to much of the literature on user/developer interactions where developers tend to take control and lead, if not control, the process. The *Outils-Réseaux* developers and trainers try to fade into the background. They strive to be attentive and reactive, but the appropriation/use process is squarely in the users' hands—either individually or as a group. This is reflected in the attitude of proposing and then waiting to see what happens. No one knew in advance what would happen when they began to work with the garrigues debates, or how the participants in the training programme would react to the different tools proposed. In fact, different working groups picked up on different tools and combinations, and they used them to different ends. Coherence within a user-driven approach implies that different rhythms and selective appropriation of tools are expected and accepted.

Selective appropriation and use would be much more difficult to manage were it not for *Outils-Réseaux'*s modular approach. In a building block approach, bricks can be assembled in different ways without compromising the integrity of whatever structure results. Different packages of tools can be assembled into a customised whole. What is more, when combined with a user-driven approach, the users themselves can do the customising. The user/developer divide tends to dissolve as users take up tools, improve upon them and pass them on. This is precisely what has been happening in the AnimaCoop programme, as the participants return to their roles as local community organisers and implement some of the things they have learned. In terms of implications for open innovation, when the possibility for evolution is designed into the process and the system, it increases the ability to deal with incremental changes in a situation. This opens the possibility for viewing innovation as an ongoing phenomenon rather than one of radical rupture. Providing the flexibility needed to deal with evolution may, in turn, further enable innovative behaviour.

Finally, *Outils-Réseaux* is working on two fronts that, together, encourage open innovation. The infrastructural support for collaboration (the tools and the way they are assembled) that it promotes reflects values of openness and transparency, and make both direct (*Saga pedo* inquiry, garrigues debates) and indirect (AnimaCoop) reference to the collaborative, constructed nature of knowledge. *Outils-Réseaux* also accords much importance to reflecting on experiences with its client organisations. Contacts are frequent and often informal. This sharing of experiences helps anchor knowledge as well as to multiply it.

6.5 Implications for Research: From Modularity to Open Community Innovation

Open collaborative innovation projects involve users and others who share both the work of generating a design and the results of their individual and collective efforts openly. Each contributing user innovator does some fraction of the work, but can rely on others to do the rest. Everyone involved obtains the value of the entire design.

Baldwin and von Hippel (2009) note that modularity is important for collaboration in design because separate modules can be worked on independently and in parallel, without intense ongoing communication across modules. When projects are small, each contributor's activities are relatively "transparent" to his or her collaborators. Larger projects can be divided up and reassembled. Quick, low-cost communication as enabled by the Internet, and ease of use—as enabled by the Wikini and the simple technologies promoted by *Outils-Réseaux*—are essential for ensuring coordination in open collaborative innovation. This is in fact the pattern observed in successful open source projects and other forums of open collaborative innovation (Raymond 1999; Franke and Shah 2003; Baldwin et al. 2006). Using the modular design architecture as a means of coordinating their work, a collaborative group can develop an innovative design that is many times larger in scale than any single member of the group could manage alone. The *Saga* inquiry clearly illustrates the possibilities of many people working together in a loosely connected way to produce something of value to the entire group. It also illustrates the importance of innovation by ordinary users.

Innovations by users form an important aspect of open innovation and in some respects the most radical part of it. While user innovation has been systematically examined for some time, much of the research has focused on lead users (von Hippel 2005) and on asymmetries in information and power between developers and users. A focus on lead users and widely recognised inventions may only address part of users' relevant innovativeness, however. The success stories presented in this chapter illustrate the collective, collaborative nature of open innovation. They also show how innovation may emerge from local, everyday practices that produce incremental changes, rather than major inventions. *Outils-Réseaux*'s goal is to put collaborative tools, and thus power, in the hands of ordinary users. In the case of the *Saga* inquiry, individual users produced not only a considerable body of

knowledge, but also a community through their actions. In the garrigues debates, participants became aware of new ways of organising themselves as they experienced collective intelligence. In the AnimaCoop training, participants became designers as they assembled collaborative tools for their groups' use.

We suggest that the concept of *community innovation* (van Oost et al. 2009) can be useful in describing the type of emergent, user-initiated project in which the community itself is an essential element of the innovation. *Outils-Réseaux* leads the groups they accompany to understand their project as an evolving entity, shaped by the activities of a community of actors who, with collaborative tools, are simultaneously users and producers. *Outils-Réseaux* mediates between the social world of users and the technical world of software developers. The concept of community innovation addresses the interrelation between social actors and the technical tools and contextual elements surrounding them. It also focuses attention on the evolving nature of a project. Outils-Réseaux aims at training and accompanying users so they can be autonomous. Empowering the user clients is at the heart of *Outils-Réseaux* approach.

Merkel et al. (2005) suggest that collaborative tools may be particularly appropriate for the types of activities carried out by community groups. In promoting conceptual and technical tools that enlarge the range of possibilities and give communities greater control over the use of technology in their organisations, *Outils-Réseaux* is working towards the sustainability of community innovations. The process is dynamic in the sense that a group's composition, expectations and priorities evolve as they experience collaboration and gain experience (and confidence) with collaborative technologies. *Outils-Réseaux*'s accent on simplicity, its toolkit approach (Franke and Schreier 2002), its actions in a boundary spanning between users/developers (Fleming and Waguespack 2007) and its leadership/animation activities thus position it as facilitator of community innovation at the local level. The ultimate goal remains to encourage an emerging civil society in which ordinary citizens become more and more actively involved in shaping their technical and social environments.

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