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Open Innovation Networks

PROJECT REPORT

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1 General Idea and Motivation

This project rests on a simple proposition: Some significant subset of social problems that communities confront are (or can) be structured as knowledge creation and/or problem solving domains similar to the 'problems' that the open source software community has found new ways to 'solve'. It follows that the tools and governance principles of the open source software community, in some modified form, could yield new approaches to community organization and problem solving.

The challenge and opportunity here is highly general across political communities, but is felt in some ways most distinctly within Northern European social welfare states. Imagine a simple tripartite scheme of a society like Finland, broken up into organizations that sit within the public sector, the private sector, and civil society. The economics and demographics of Northern Europe are driving many of the welfare functions that have for some time been provided by the public sector, out of that sector. Some of these functions move into the private sector. Social scientists have learned a great deal in the last 20 years about the upsides and downsides of what is commonly called "privatization'.

We know much less about how to set up systems for moving some welfare provision functions into the civil society space. In countries or regions with deeply rooted and well-developed civil society institutions some of this experimentation will happen de facto. Northern European welfare states present a particular challenge and an opportunity on this score. Extremely effective public sector provision of social welfare functions has left behind a somewhat weaker civil society sector. One goal for the project is to make progress on creating pragmatic, workable alternatives to 'privatization' that can be implemented and can evolve within a developing civil society space, in cooperation with the public and business sectors.

The open source software movement offers a new powerful model for people to cooperate to build great things. The Internet and the World Wide Web – critical components of our information age – are both products of and tools for this new way of doing things. The Internet and the World Wide Web were not built by corporations or governments, but rather by enthusiastic people who shared their creations openly with others in the world, using their very creations to further cooperate with people who were physically separated. This model of production is becoming more prominent, notably with the development of the Linux operating system, and is actually changing how technology industry is working (for example, IBM alone is investing one billion dollars for advancing Linux).

The people behind this technological transformation have called their approach the 'open-source model.' In our attempt to understand how this constitutes a new more general model for accomplishing great things – what we call the Social Web – it is useful to first look in more detail how it worked so powerfully in the technology world. The development of the World Wide Web and Linux are good cases examples. The idea of the Web was created by the Englishman Tim Berners-Lee who was working at the Swiss physics research center CERN and was enthusiastic about a new way for people to communicate. As soon as he had his first version of the Web ready, he announced the idea to others and encouraged them to join him in developing the system for everyone. Later he has described what happened and how the Web then progressed: "Interested

people on the Internet provided the feedback, stimulation, ideas, source-code contributions, and moral support that would have been hard to find locally. The people of the Internet built the Web, in true grassroots fashion."

The story of the Linux operating system is very similar. Behind it was a 22-year-old Helsinki university student Linus Torvalds who was avid about the idea of a new operating system and wanted to build it with others. Again, as soon as he had the seed of the system ready, he made it available to everyone on the Net, asking others to join and contribute their complementing expertise. Gradually hundreds of other developers joined him to develop the system. The result we know well now.

There are three especially important elements in the open-source model. First, the main idea of the open-source model is that all solutions are given openly for anyone

1) to use
2) to correct,
3) and to develop further

– on the condition that all new developments are also given for others openly with the same rights. This model makes it possible for people in different locations to join their forces together to improve things.

Secondly, there is a 'referee' process for coordinating the various contributions. In the open-source world, this is usually done by a referee group that is a group of people that are trusted by the rest of the developer community. For example, in the case of Linux, the referee group consists of Torvalds and a few other key developers that have earned the trust of the community through their accomplishments.

Thirdly, what drives the process is caring about the matter and the powerful experience of belonging to a community that cares about the same matter and gives recognition for one's contributions to the community. Eric Raymond, a participant in the Linux development, describes well the first dimension of this spirit (he calls their ethos 'the Unix philosophy' because Linux is a Unix-type operating system; but the more general idea is clear):

> To do the Unix philosophy right, you have to be loyal to excellence. You have to believe that software is a craft worth all the intelligence and passion you can muster. … Software design and implementation should be a joyous art, and a kind of high-level play. If this attitude seems preposterous or vaguely embarrassing to you, stop and think; ask yourself what you've forgotten. Why do you design software instead of doing something else to make money or pass the time? You must have thought software was worthy of your passions once. …
>
> To do the Unix philosophy right, you need to have (or recover) that attitude. You need to *care*. You need to *play*. You need to be willing to *explore*.

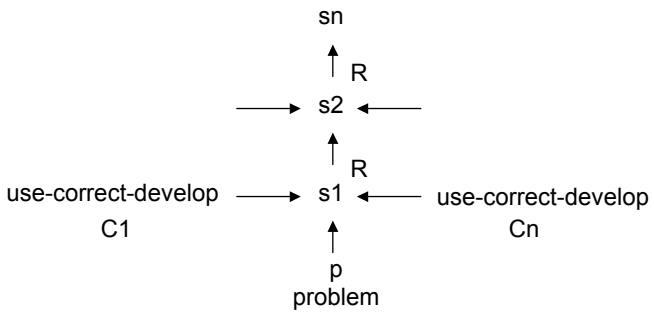
THE SOCIAL WEB

The idea of the Social Web is based on the experience of the open-source model. The open-source movement, a cooperative approach to developing computer software, has demonstrated that individuals can effectively cooperate to achieve significant goals without the imposition of a strict hierarchical organization. But the approach itself is not necessarily limited to the technology area: in other fields of life, there are also vast numbers of people who care about some problems and would love to join their forces together to develop solutions openly. Thus, we are proposing to explore the idea of a Social Web that would give non-technical people tools to join their forces to solve their relevant social problems.

The Internet and the World Wide Web form the foundation for the Social Web. In the Social Web model, problems, ideas and solutions are expressed on the Net openly. As in the open-source model, the openness of the cooperative development means that the solutions are given openly for anyone

1) to use,
2) to correct, and
3) to develop further

– on the condition that all new developments are also given for others with the same rights.



s = solution C = community R = referee process

An essential component of this approach will be a 'referee' process through which the different ideas, corrections, and improvements are integrated. The nature of this process is not obvious in the broader world and understanding the alternatives is a major goal of the research.

What drives the open source community is primarily caring and peer recognition. Individuals are motivated by working on problems in which they are personally invested, and by the peer recognition they received for their work. These ideal motivations, however, are not necessary conditions for the concept of the Social Web. Whatever are the reasons that people work on these problems, they will benefit from the Social Web approach.

The Social Web concept expands upon basic use of the Internet and the World Wide Web. To make the open development process possible for non-technical people, a simple-to-use set of tools that expand the current Net is needed. We envision an extension to the Net that makes it easy for people (1) to share their solutions and to send their corrections and improvements, (2) to facilitate the referee process of integrating these together, and thus (3) to edit the evolving database of solutions (cross-linked to (1) and (2)). The software requirements to support such development is another major goal of the project.

POSSIBLE APPLICATIONS FOR THE SOCIAL WEB

In providing a new model for cooperation and the tools making it possible, the Social Web approach tackles two big paradoxes of the information age. First, we are the most educated people in history. Skills abound around us. Still, these skills are very rarely joined together. Partly it is because our life has become too 'institutionalized' – everything is the task of some institution: creativity is the task of businesses, caring is the task of the government, etc. Additionally, it is often the case that individuals with similar problems are located separately from one another and lack obvious means by which to share ideas. The Social Web should make it possible for people in different locations to cooperate to share ideas and collectively solve problems.

Second, it is often the case that there already exists a wealth of tacit knowledge and experience among individuals in disparate locations that has not been formally compiled into a functional repository. Thus some of these individuals may have already determined the solutions to problems others face, but lack the ability to access those solutions. The Social Web will make a collective accumulative development possible, making everyone benefit by anyone's ideas, corrections, and improvements, because of bringing problems and solutions together.

Some concrete examples of how the Social Web could be applied in the real life problems illuminate also these paradoxes. There are plenty of other very interesting applications but the following can be mentioned as examples:

(1) Citizen organizations
Linking people together around a shared cause. There are thousands of areas where people would benefit from sharing information and developing it together further.

(2) Education
Linking teachers, researchers, and learners together to develop better learning materials and practices. Think of how much disposable teaching materials and learning there is in the world. Think of how much potential there would be in joining this together and accumulating it on the Net. Think of how many enthusiastic learners there are among the millions of learners in the world, ready to make a more meaningful learning contribution in the form of developing oneself learning materials. Think of how many teachers and researchers could join and how this interaction between all levels of study could benefit all. This would be locally or nationally very beneficial.

In the global scale, this could even mean a worldwide Net Academy. This kind of a Net Academy would benefit us all, but developing countries can be mentioned separately: one of the main reasons for the gap between developed and developing countries is the knowledge gap – a more open flow of high-quality knowledge would help the position of developing countries considerably.

(3) Health
Linking health professionals, decision-makers, and customers together to develop better processes in health care.

Currently, there are many innovative thoughts about how the health care processes could be made better but these innovative people are scattered in different places. There are also good innovations already made in separate places but others do not know about these. Forming a network including health professionals, decision-makers, and customers would give a basis for encouraging innovations and spreading them better. Customers as the users of the system are a very important new source of ideas – something that the business world has recognized for some time now.

In the global scale, this kind of a network would help transferring critical knowledge to developing countries. It also provides a new model for sharing important experience within developing countries and forming networks for building solutions relevant to these countries.

(4) Elderly care
Linking the elderly, the young and the social workers together to improve the life of the old. In developed countries, one of the key challenges is the aging population. It is well-known that loneliness is one of their biggest problems. It is also known that most elderly would like to live in their homes as long as possible. But this is not possible without the help of others. For society, supporting living at one's home is economically very important as the costs of institutionalization of the elderly are huge. Thus, human and economic reasons lead to the same conclusion: it is desirable to find new ways for supporting the life of the old in their own homes. A new approach is to use the young to interact with the old: The kids or students spend time with the elderly and at the same time collect information, problems etc. that are relevant for the old to be developed. This feedback goes back to the social workers who also take care of the old and thus improve also that system. The young take the matters important to the old to the Net and get new information relevant to the old from the Net to them. Here, the Social Web consists of the social workers, the young, and the elderly helped in communication by the young.

The possibilities are limitless. Many more examples could easily be listed. However, here the purpose is not to attempt a comprehensive list of the possible applications of the Social Web. The main purpose is to provoke everyone's own ideas. This is because the critical point is that Social Webs must start from the people who face the problems – it must be *their* problems. The Social Web is meant as a general approach and tool for the purposes that people *themselves* invent. In this sense, we call for everyone to join us in expanding the possibilities of the Social Web for the benefit of us all.

PILOTING THE SOCIAL WEB

In this report, we discuss the problem of building the Social Web model and its tools in more detail. However, the final description of the model should be done through the experience of two or more actual pilots, for example one in Finland and one in California. This report is meant as preliminary theoretical background work and pilot design work for (possible) pilots.

We have now a good picture of the theoretical framework and questions to be faced in the actual application of the Social Web. We have mapped out the key existing projects in this field and learned from their experiences. We have mapped out the existing technical systems and challenges so that we command a good view about the technical basis on which to build the Social Web. We have made plans for two interesting, different enough but complementary, pilots and progressed already in forming the networks ready to execute the pilots.

2 Existing projects

Of course the idea of Communities of Practice is as old as civilization itself. What is new and important is the possibility for groups who have little or no physical contact to work together. The most visible and successful instantiation of this is the open source software movement. Both Pekka Himanen and Steven Weber have recently completed book length studies of this phenomenon and we will not try to summarize them in this report. But we will discuss two additional success stories on distributed community problem solving.

The Eureka Project

Large organizations face significant challenges when attempting to implement community knowledge sharing systems. While many of these systems fail to meet expectations, one notable exception is Xerox Corporation's Eureka Project. Just as there are distinctly different reasons why these systems often fail, there are distinctly different reasons why exceptions such as Eureka are successful. A careful examination of the Eureka case vis-à-vis the tradeoffs in system design discussed earlier reveals the Eureka Project as an unintended – but enlightening – empirical exercise in studying these tradeoffs.

Xerox Corporation has a large force of field technicians responsible for the maintenance and repair of their document processing machines. In the early 1990s, researchers at Xerox's Palo Alto Research Center (Xerox PARC) began to investigate ways to improve technician efficiency by aiding them in diagnosing and repairing problems. Specifically, they were seeking to develop means of better providing technicians with information that could be used to diagnose unusual field problems not predicted by the design engineers in the lab. In conducting their research, the Xerox PARC team (later known as the Eureka Team) discovered that a significant amount of this information was acquired by individual technicians responding to field calls, and that they possessed no formal medium to share that information.

In designing the system, the Eureka Team placed special emphasis on the ideas and contributions of the users of the system. One of the primary and initial concerns voiced by the technicians, customer service professionals, and their respective supervisors was the validity or trustworthiness of the information provided in such a system. This feedback led the system designers to establish criteria for the status of tips submitted by technicians, and to establish a system for validating (or changing the status of) submitted tips. Essentially, the Eureka designers were evaluating the trade-offs of our first two criteria (discussed in Section 3): "weighting of contributions" and "evaluating the contributor vs. evaluating the contribution."

Though not formally following our criteria, the designers' decisions about how to evaluate and track contributions were crucial to Eureka's success. Quality of tips was obviously a crucial requirement, suggesting a hierarchical validation system managed by experts at the top who processed and disseminated the tips they felt were most relevant. This model, however, did not fit with the operational model that most technicians used when informally sharing their data. Furthermore, the sheer volume of potential information sources rendered such an approach infeasible. Likewise, it was highly plausible that technicians could submit inaccurate tips that might

mislead others, making a fully open submission scheme equally ineffective. Thus, rather than following the typical practices that high-level management would suggest, they developed an innovative method by which anyone could submit a tip, but all tips had to be validated by groups of individuals. These groups of individuals worked together with the technicians who submitted the tips to determine validity, ensure tips were properly codified, and when appropriate, elevate them into the community knowledge repository of the system.

An essential component of the effectiveness of the system was that it became embedded in the daily routine of the technicians using it. The Eureka team found that the system became widely popular with technicians who integrated its use into their standard diagnostic approach, at times even supplanting the standard diagnostic manuals as their first step in diagnosing a problem. Conversely, the team found that if the technicians viewed the system as an imposition on their daily routine then they would be reluctant to adopt it, negating both it's micro-effectiveness for the individual user and the macro-effectiveness of the system due to lack of contributions.

For example, one technician describes how "I check Eureka before I go to a site, that way when I get there I already know what parts to bring in" (Bobrow 13). Another discusses how Eureka has become embedded as an informal learning process: "Whenever I download [new Eureka data] I like to look through it. See what guys are doing. I go looking through the tips and Bulletins. It just sort of teaches me a lot" (Bobrow 13). These discoveries were an essential part of the "in-practice" research that the Eureka team conducted, and we intend to adopt a similar approach in our research.

The choices that the Eureka team made to "evaluate the contribution" and to weight contributions in a binary fashion (either "in" or "out" of the system) were crucial to its success. Technicians were pleased to be able to contribute their ideas, and were further happy to have the opportunity to discuss them. Thus the opportunity to discuss submissions with the validators and to have each contribution weighted on its merits encouraged them to submit. It was crucial that technicians be able to depend on the tips they received from Eureka - otherwise, they suggested in interviews, they might not have used the system as frequently. Hence the binary status for submitted tips ("in" or "out") was important. The success of these and other design choices suggest the importance of designing community knowledge sharing systems using on the criteria we propose here.

The IETF

The Internet Engineering Task Force (IETF) is a loosely organized group of individuals whose primary mission is to contribute to the development of new Internet standard specifications. They are unique in that their organizational structure, aside from the activities of a relatively small administrative support staff and a series of quarterly meetings, is primarily maintained through Internet communications. This group has become a *de facto* Community of Practice within the organizations responsible for the governance of the Internet.

While the IETF does have a loose organizational structure, particularly in terms of the division of labor with respect to various areas of technical specialization (working groups), it lacks obvious hierarchical structure and conducts its work through what it calls "rough consensus" and "running code." Work is accomplished primarily via email using listservs in which group members will introduce, discuss, revise, and conclude on standards recommendations. As described in "The Tao of the IETF," "the vast majority of the IETF's work is done in many 'Working Groups,'" which are "really just mailing lists with a bit of adult supervision." While this statement is an oversimplification of Working Groups, the less formal nature of the IETF's structure has enabled it to remain a "nimble" organization and keep pace with the rapidly developing technologies for which it is responsible.

The success of the IETF, both in remaining cohesive and in accomplishing meaningful work, is of particular relevance to our research. It speaks to the potential of information technology-enabled communities of practice and their ability to allow geographically disparate groups of individuals to interact, on projects that they otherwise would not do. It can also lead to significantly lower transaction costs for all projects (regardless of whether they would engage in them anyway or not).

It is not clear exactly why the IETF has been so successful in remaining cohesive and productive, however it does seem apparent that their organizational design choices have played an important role in this success. A cursory examination of this development suggests, that whether consciously or not, the development of the IETF and its operation today have made good choices on the tradeoffs discussed in the theory section of this proposal so as to facilitate its function consistent with the goals, values, and lifestyles, of its members and the responsibilities and goals of the organization as a whole.

3 Theoretical issues[1]

The project rests on this proposition: Some significant subset of social problems that communities confront are (or can) be structured as knowledge creation and/or problem solving domains similar to the 'problems' that the open source software community has found new ways to 'solve'. It follows that the tools and governance principles of the open source software community, in some modified form, could yield new approaches to community organization and problem solving that build on but go beyond what is currently known about traditional institutions of formal government as well as the more informal notions of 'civil society' and 'communities of practice' (CCoP).

Our goal is to design a system that:

- **has effective individual incentives, organizational structures, and information technology tools.**
- **pulls together distributed knowledge within communities that are trying to solve practical problems.**
- **combines pieces of knowledge into something useful.**
- **ensures that error correction exceeds the rate of error introduction as the system 'learns'.**
- **maintains the process over time in a sustainable, non-exploitable, and expandable way.**

The challenge and opportunity here is highly general across political communities, but is felt in some ways most distinctly within Northern European social welfare states. Imagine a simple tripartite scheme of a society like Finland, broken up into organizations that sit within the public sector, the private sector, and civil society. The economics and demographics of Northern Europe are driving many of the welfare functions that have for some time been provided by the public sector, out of that sector. Some of these functions move into the private sector. Social scientists have learned a great deal in the last 20 years about the upsides and downsides of what is commonly called "privatization'. We argue around the margins about how to engineer the transition and we argue about the overall efficacy and desirability of the outcomes, but at a high level we do understand a fair amount about sensible governance principles and the trade-offs they engender in the private sector setting.

We know much less about how to set up systems for moving some welfare provision functions into the civil society space. In countries or regions with deeply rooted and well-developed civil society institutions some of this experimentation will happen de facto. Northern European welfare states present a particular challenge and an opportunity on this score. Extremely effective public sector provision of social welfare functions has left behind a somewhat weaker civil society sector.

1 The beginning of the Chapter 3 is similar to the beginning of the Chapter 1. This is because the beginning of the Chapter 1 is meant to be like a lead into the whole paper: the idea is that it would already make the main points about the whole approach.

There is less existing structure to work with. This raises the stakes for disciplined and theory-guided experimentation. One goal for the CCoP project is to make progress on creating pragmatic, workable alternatives to 'privatization' that can be implemented and can evolve within a developing civil society space.

What is the nature of the problem?

We focus our attention on a class of complex social problems that people try to solve, sometimes alone but more often together. The class of problems we are looking at have three characteristics. These problems are multi-dimensional in the sense that they call on several different realms of expertise. They are large in scope, in the sense that they require some kind of division of labor to make progress. And they are complex in their essence not just in their implementation. We mean here that the problems we are interested in are substantively and inherently difficult to solve, not difficult only because of the failure of well-understood social or political processes to yield optimal outcomes. (The third characteristic requires additional justification, which we will come back to). An example: to build an effective public health information system requires realms of expertise and demands a sophisticated division of labor. And it is a substantively difficult engineering problem.

The analogy to the software story should be obvious. Complex software is hard to build because it is multidimensional, because it demands a division of labor, and because the problems it is trying to solve are inherently hard. Brooks' Law is a statement about the software engineering manifestation of a simple but profound observation: Human communication about complex, often tacit goals and objectives is imperfect and gets more imperfect, and at an increasing rate, as it travels between larger numbers of people. One way to manage this dilemma is to enclose the process within a formal organization, a proprietary software company. The ideal-type principles of organization here are command and control authority, hierarchical structure for decision making, and tight governance of principal-agent problems. To sustain that kind of organization in the software world requires that companies keep source code secret.

The open source community, by releasing source code, undermines the possibility of setting up the production system in the same way and energizes a quite different organizational model. While the model of the open source community clearly inspires our project in an abstract sense, we are not betting on anything like a wholesale transfer of the organizational model(s) from this community to the non-software world. What we are focusing on instead is the means by which this community processes, collates, upgrades, corrects, distributes, and implements problem-solving information, as an indicative model. We are treating the related issues of intellectual property rights and organizational structures that are core to the open source community as instrumental, not foundational. What is foundational for our project is the information processing 'system' that is taking place in this community, and how the results of that process are incorporated into real solutions to practical problems.

Back to the third characteristic of the class of problems we are focusing on. It may seem quixotic to think about complex social problem solving as an information processing challenge. After all, we know that innovation in this setting traditionally is slow, constrained, inefficient, and frustrating. And we know, starting with the work of Max Weber and Joseph Schumpeter and extending into modern public choice theory in political science and management theory in business, some of the reasons why that is the case, in particular the organizational disincentives and cultural impediments to change that are inherent parts of bureaucratic culture and institutions.

Our project does not aim to produce new knowledge around this part of the problem (although we certainly use the arguments, findings, and strategies that others have generated here to support our initiatives). Instead, we are focusing our efforts on the information-processing part of the problem, to start. It is our intention to think about the political and organizational challenges as dependent variables. In other words, to design the governance institutions in ways that facilitate

information paths that we think will work, rather than the other way around. This is worth experimenting with in part precisely because it is the reverse of standard ways of thinking; and in part because we know more about the trade-offs associated with governance institutions than we do about the information processing issues.

In summary, the CCoP project aims to develop *problem-solving practices*, that necessarily include an information processing algorithm *and* the associated institutional structures and incentives that make that algorithm function in real world settings. These practices will tap into distributed knowledge, that in some cases may be present in geographically-dispersed individuals or communities; in some cases may be present in separate pieces that have not been integrated into a single, useful whole; and in some cases may be implicit in relatively undefined or tacit practices that 'belong' to individuals' experiences – but are for that very reason not available for use, testing, and refinement by larger groups. Our bet is simply that an important subset of social organization problems fit in this category and can be attacked in this way.

What incentives and design principles will facilitate the development of Civil Communities of Practice?

The existing literature on communities of practice is principally drawn from business schools, where communities of practice are talked about as boundary-spanning groups of people who work together for functional reasons, across institutional borders, for extended periods of time, and in the interest of upgrading their performance in some discrete realm. CoPs are thus said to be defined by three functional elements: a domain, a community of people, and a shared practice that the people are developing to be effective in the domain.

A critical question for any CoP and particularly for the CCoP notion is who defines the domain and how. If successful CoPs do not tend to form around abstract areas of interest but rather around problems that members commonly experience, it is still a core question who gets to set and update the definition of the problem. Within the open source community the iconic answer to this question is Linus Torvalds, de facto leader of the Linux project. Studies of CoPs in business organizations show that successful CoPs typically have a coordinator whose roles include (but are not limited to) identifying and maintaining the boundaries of the problem domain, planning and facilitating community action, suggesting new linkages among community members and thus bringing together disparate pieces of expertise, managing the boundaries between the community and any formal organizations in which it is embedded, and assessing the health of the community and communicating that assessment effectively to members.

We have not yet decided how to provide this set of functions in our test beds. While the roles or tasks of a coordinator may indeed be necessary we do not yet want to default to the notion that one person plays this role over time. Outside of Linux other open source projects have different coordination mechanisms (examples include the Apache group and the Perl rotating leadership system). This is a place for experimentation. We suspect that for a CCoP an additional and critical coordination role will involve creating and sustaining a fervent and robust sense of collective enterprise, since there are less likely to be monetary or career rewards that CCoP members gain in close association with their membership in the community (as you would expect to see in a business setting).

The CoP literature offers a set of relatively obvious but useful design principles that are said to contribute to success. None of these is well enough specified to be operational but they are clearly worth keeping in mind as a checklist against which any system design can be compared. They are:

- Design for evolution (i.e. allow the community to change)
- Open a dialogue between inside and outside perspectives (tightly insulated communities tend to corrode)
- Allow for different and bursty levels of participation (different people will participate at different levels, and any single person will participate at different levels over time)
- Preserve both public and private community spaces (not all community interactions are public, backchannels should be available)
- Focus on the value that is created for the people in the community
- Mix the familiar and the new
- Facilitate the creation of a rhythm (pure bursty-ness and unpredictability tends to corrode commitment)

These design principles actually presuppose rather a lot about the nature of the knowledge that the CCoP is trying to generate and share. To get to more precise and operational notions about how we set up our system, we need to parse out some of the variation and assumptions about that knowledge and some of the different ways it may be embedded in the communities we are trying to help organize.

Consider the common saying, 'none of us is as smart as all of us.' While this is likely true in some abstract sense of the complex, multidimensional, and large scale social problems we are interested in, its value as a solution strategy clearly depends on a lot of (separable) parameters that are not guaranteed to work out right. If we get the parameters wrong, it is just as likely that none of us is as stupid as all of us. The operative assumption is that each one of us has bits and pieces of 'good' (useful) knowledge and 'bad' knowledge about a problem. And depending upon how the community selects, recombines, and iteratively moves that process forward over time, we can make the collectivity either very smart or very stupid. We are just saying explicitly here what Eric Raymond implied but did not say clearly about the open source process. It is not simply that 'with more eyeballs all bugs become shallow.' It depends directly on how those eyeballs are organized.

We are thinking about our system design with two major aspects of this issue in mind: how is knowledge distributed in the community, and what are the error correction mechanisms that we can apply to that knowledge.

We know from both intuition and experience that much of what a group needs to 'know' in order to do something is in fact coded in the experiences, tacit knowledge, implicit theories, and data that is accessible to individuals – who don't know how to, aren't incentivized to, or haven't thought of sharing it with others in a mutually beneficial way. We know also that there is noise in the signal. At best, the pieces of distributed knowledge that (if they could be brought together effectively) make up a solution to a problem, are floating around in a sea of irrelevant or incorrect 'knowledge'. In a changing environment, with strategic players, and a relatively low tolerance for cascading failures that hurt human lives, there is no recourse to a law of large numbers or an evolutionary selection mechanism to solve this problem for us. We need an engineered system.

We also know that these are very large hurdles to get over. Large corporations and consulting firms commit huge resources to knowledge management systems that try to work with this reality. With very few exceptions (Xerox's Eureka project, which we discuss below, is notable here) these investments under-perform against expectations. Without indulging here in a long analysis of why this is the case, it is worth noting that there are distinctly different ways for the system to fail. The most common and probably the most frustrating is simply that nobody uses the system, or not enough people use it to generate sufficient interest. More troubling is the failure mode in which the 'wrong' people use the system –people with good intentions who happen to have bad information, or people who might be trying to game the system or intentionally insert bad information to support strategic behavior. There are other potential failure modes, but the point is to recognize that neither knowledge management systems nor a CCoP community knowledge repository 'must'

work or 'must' get more effective over time. There is no inherent ratchet-up mechanism. The system could deteriorate over time in several ways. People could share mistakes with each other and scale them. People could re-use past experiences which are seen as successful in the short term or by particular individuals but actually are failures overall from the long term perspective of the community. You could attract the wrong 'experts' into your network, or perhaps more likely use experts for the wrong purpose. And you could populate a database with garbage and produce multiplying wastes of effort and cascading failures of behavior.

How knowledge is distributed directly affects the search problem that faces an individual looking for a solution to a problem. There are at least three different situations we can clearly imagine a CCOP would face. Case 1 is where I have a question, some other individual has the answer, and the problem for me is can I find that person and is that person incentivized to share what she knows. Case 2 is where I have a question and no single other person has the answer; instead there are pieces of the answer known by or embedded in many peoples' experiences. The relevant bits of information float in a sea of irrelevant information; my problem is to separate out the bits of signal from the noise and recombine them into an answer. Case 3 is a search and discovery problem. Some of the knowledge that I need is floating around in disaggregated pieces (as in Case 2) but not all of it; I need to find and combine the pieces of what is known and then synthesize answers or add to that new knowledge from outside the community itself.

Consider the dilemma of the person trying to successfully complete the search. She doesn't know to start if she is in Case 1, 2, or 3. And it matters for what kind of search algorithm she will want the system to provide for her. For example, should she use a snowball method (go to the first node in the network and ask that node where to go next)? Or some kind of rational analysis rule? Or a random walk? And now consider the dilemma of the person trying to design the system: We don't know if the searcher is an expert or a novice; we don't know how entrepreneurial or creative she is; we don't know what her tolerance will be for signal to noise ratios; or what her preference is for type 1 versus type 2 errors.

Our aspiration of course is to design a system robust across these uncertainties. If that is not possible (and it may not be), then to design a system that can diagnose to some degree and adapt to uncertainties as they resolve through the system's interaction with the community.

Realistically at this early stage of the experiment our objectives are much more modest. We want a system that is somewhat flexible across these dimensions of uncertainty and, critically, is both explicit and transparent about the choices it embeds in design principles. To get to that objective we need to look more closely at the knowledge cumulation and error correction mechanisms we will incorporate; what we call for short the 'referee' function in the system.

What are the key trade-offs in referee functions for CCOP?

Our preliminary architectural sketch for the CCOP system envisions at least two distinct levels of knowledge collection, a fully open bulletin board type space and a refereed 'community knowledge repository' (CKR). The value of the distinction lies in the gating or refereeing function: what gets in to the CKR and what does not, as well as what leaves the CKR and what stays. At the highest level of abstraction there are at least three big challenges here to design against:

- 'Useful' knowledge, knowledge that could advance users toward their goals, fails to get into the CKR (similar to a type 1 error)
- 'Erroneous' knowledge, knowledge that could detract from users' efficacy, gets into the CKR and is not quickly removed (similar to a type 2 error)
- 'Irrelevant' knowledge, knowledge that neither helps nor hurts directly but wastes time and effort of users, gets into the CKR and is not removed (more noise in the signal)

At a more precise and operational level we have identified eight design issues that our referee system will have to grapple with. A few preliminary comments apply to all of them. The eight trade-offs are not comprehensive and they are not sharply exclusive of each other. In proposing them we are looking for a systematic way to evaluate key trade offs in design among the different values that we (or more appropriately, the community in question) wants to optimize against. We are not trying to find the sweet spot on any of these trade offs right now; we are just trying to understand them more precisely so that everyone can be aware of how any architectural or other decisions play against them. We know that neither we nor a participating community can or should even try to get the balance 'right' at the start, so the system needs to be built so that it can evolve and test different combinations of trade offs. But it also needs to work well enough to start, that people can see clearly some immediate value and the promise of a constructive evolution path.

Issue 1: Weighting of contributions

We assume that within any problem-solving community not everyone is equally knowledgeable, that different people know different things, and that they know them with different levels of accuracy or confidence. The means for weighting contributions within the system should reflect these differences so that when information conflicts with other information a more finely grained judgment can be made about how to resolve the conflict. Mass politics teaches us a great deal about how *not* to weight contributions (e.g. by who is tallest, richest, or loudest) and the electronic nature of the system facilitates removal of those factors. But it also demands a precise and unambiguous algorithm. That kind of transparency is both desirable and risky. Some existing systems have hedged against making this decision in a granular way by adopting a binary weighting system – in Eureka, for example, a 'tip' is either in or out. Others have more complex and continuous weighting schemes (Slashdot, for example).

Issue 2: Evaluating the contributor vs. evaluating the contribution

Information can be evaluated on its own terms, but it is often easier to pre-score information based on the reputation of the person who is putting it forward. Many social problem solving systems rely very heavily on the reputation of the contributor; the CCOP probably does not want to replicate fully this 'winner take all' dynamic but it probably can't afford to ignore it entirely since there is almost certainly some relevant meta-data about the quality of a piece of knowledge in both what we can know about the contribution *and* what we can know about the contributor. Eureka appears to be at one end of the continuum (the system solely evaluates the contribution in a formal sense) while EBay, for example, is at the other end (the system solely evaluates the reputation of the seller or buyer, not the quality of the good for sale).

Issue 3: Status quo vs. change bias

The notion of a 'repository' is inherently conservative. Once a piece of information enters the repository, it gains status that other information does not have. Yet we know well that in many of the kinds of problems our communities are likely to be talking about (and in much of human knowledge more generally) the process of learning is largely a process of forgetting what we thought was correct, information that had in fact attained special status at one time. The question is, how conservative should the system be, in terms of preserving existing knowledge? The answer to this question depends (at least) on the interaction between two separable parameters: the nature of the community that is producing the knowledge and the nature of the environment in which that community is operating. For example, a community that is culturally biased toward the status quo, perhaps because of ingrained respect for 'authority', might benefit from a system that compensates with a bias toward change. If that community is living in a rapidly changing environment the case for a change bias is stronger. Both parameters could

point in the other direction as well; too much churn in a repository would rapidly reduce its practical usefulness, particularly in a problem environment that is relatively stable.

Issue 4: Timing

However a community comes to set the parameters around status quo and change biases, the issue of timing remains. More precisely, the system needs a sense of how urgently information should be updated, against the appropriate and useful desire to maintain a stable foundation. The obvious analogy in democratic electoral systems is to the question of how frequently to hold elections. A major design consideration here follows from our sense of how 'bursty' input into the system is likely to be. Will people contribute at a fairly regular rate, or will they tend to contribute in short high activity bursts followed by longer periods of quiet? It is important that the rate of evolution that we design for in the CKR not exceed the rate at which people choose to participate and add input. At the same time, people making contributions to the system will want to see their efforts incorporated in a timely fashion. And, it is entirely possible that the two issues are not fully exogenous to each other - that is, a more rapidly evolving system may elicit more frequent input and vice versa.

Issue 5: Granularity of Knowledge

At what level of generality or granularity should knowledge entering the CKR be constructed? In practice it will be impossible to control this tightly since people will do what they wish, but the design needs to identify a target for this variable. This is because contributors will certainly look for guidance on this issue. And it is also the case because no imaginable refereeing process can possibly be effective and efficient against many different kinds of configurations of claims of knowing things. But most importantly, there is likely to be a significant trade off between the generality of information, the utility of information, and the ease and precision of evaluation. Rather general knowledge is usually more difficult to evaluate precisely because it makes broader claims about the problem domain, but it is extremely useful across a range of issues and for many people if it is in fact correct. Highly granular and specific knowledge is often easier to evaluate, but it is in some sense less immediately useful to as many people in as many different settings precisely because it is so specific.

Issue 6: Parallelism of Learning and Forgetting

We assume that in an evolving environment, (old) knowledge will need to come out of the CKR as well as (new) knowledge being added to it. Knowledge may have to be removed for different and equally legitimate reasons. For example, what was previously useful knowledge may become obsolete as conditions change; it may be proved wrong by new information; or it may become devalued as it evolves into 'common wisdom'. The system will need to account for each of these possibilities and perhaps treat them differently (for example, a piece of knowledge that is disproved by incoming information might not be entirely wrong; keeping the story of how that happened as a lesson in and of itself may be valuable).

Issue 7: System Failure Mode

All systems, technical and social, fail. In the early stages of design and experimental implementation failures are likely to be frequent. At least some will present a confusing mix of technical and social elements. Perhaps the most critical design decision we face early on is planning for what happens when the system fails. How failures present themselves and to whom, as well as the respective roles of the system designers and the community at that moment, are the most important features. In general terms taken from Albert Hirschman, we want a system that fails transparently in ways that incentivize 'voice' not 'exit' and not 'loyalty'.

The point is that system failures are expected and acceptable. What is not acceptable are failures that cause people to exit the process overall, or to stick with it without fixing the problem.

Issue 8: Security

How we design and implement security within the system depends sensitively upon the assumptions we make about the level and style of opportunism or guile on the part of potential attacker or 'gamers' that we believe we need to guard against. This is simply a way of saying that no system can be secure against all potential challenges and that security in this case as in most others will need to be balanced out against other considerations, in particular ease of use, privacy, and open-ness. The tradeoffs here will likely change over time -- as the CKR accumulates more valuable knowledge it is likely to begin to require greater security. At the outset we will likely design for greater open-ness, relying more heavily on existing norms and practices within the community to provide internal security, and a low profile externally to 'guard' against exploitation from the outside.

4 Technical issues, including existing systems

APPLICATION SURVEY

The application survey was an attempt to examine ways in which communities with common interests have collaborated online in exchanging information or building knowledge repositories of some form. There is a wide cross-section of interest groups that share information and benefit from collaborative learning. The composition of such groups ranges from online associations of networked professionals, short-term collaborators on specific projects, businesses, hobby groups, and social exchange networks. Also, the size of groups varied vastly, as did the duration of their participation, proximity of individual participants, economic relationship between participants, and level of interactivity.

In choosing the applications, we looked online for sites and packaged software that allowed groups to interact in several ways. At the most basic level, there were application such as mailing lists – which had a basic function – allowing users to post questions, answers to which, if any, would be posted back to the entire group via the mailing list. A level higher, such mailing lists would have online space where all the messages would be stored a threaded fashion – in some cases, such space could be edited by administrators.

A level higher, applications permitted users a separate space to both mail questions and store information in a community repository. These were basically of two kinds – the commercial e-learning sites which were in the business of using the repositories as interactive instruction areas, and the whole variety of collaborative information sharing sites which may or may not be commercial products.

The applications / websites surveyed included: Carnegie Mellon University Blackboard, University of California Extension Online Learning Board, Berkeley (Haas) Catalyst Online Learning System in the e-learning segment. Among collaborative information sharing applications, we surveyed NY Times' Abuzz System, Wiki, Intranets.com, Yahoo! Groups, PlumTree, the Internet Movie Database, and the Dream e-decision site of the School of Information Management, UC Berkeley.

We created a general set of metrics to study the sites – we looked to study both the design and the interactivity features, to seek in the long term how sites allow users with common interests to share, upgrade, and organize information.

The tables below include results of the survey. We ranked on a scale of 1-5 (1 being "strongly disagree", 5 being "strongly agree")

	e-learning average	**online information sharing groups average**
INTUITIVE DESIGN AND LOGIC		
Clear Usage Instructions for First-Time Users	3.3 / 5.0	2.8 / 5.0
Intuitive Panels for Links	3.3 / 5.0	3.4 / 5.0
Guided Tour Option	2.3 / 5.0	1.9 / 5.0
Non-redundant links	4.3 / 5.0	3.1 / 5.0
Navigation Systems Consistent	4.3 / 5.0	4.3 / 5.0
New information highlighted	3.3 / 5.0	2.9 / 5.0
Site has an open source design	1.0 / 5.0	1.8 / 5.0
Major structural and design changes can be done by users	1.0 / 5.0	1.1 / 5.0
DESIGN		
Text Legible	5.0 / 5.0	4.8 / 5.0
Graphics are used only where necessary	4.3 / 5.0	4.3 / 5.0
Screen Optimized for Minimal Scrolling	4.0 / 5.0	3.0 / 5.0
Speedy Download for Narrowband Users	3.7 / 5.0	3.1 / 5.0
Functional basic services for low-proficiency users (someone with just the ability to login can interact effectively)	2.3 / 5.0	3.1 / 5.0
INTERACTIVITY AND CONTENT		
The site is amenable to large additions of text and other data content	3.0 / 5.0	3.4 / 5.0
There is a specific "links" section where users can add links	2.3 / 5.0	3.0 / 5.0
Message boards allow users to add and reply to text	4.3 / 5.0	4.9 / 5.0
Information Additions are done immediately	4.3 / 5.0	4.5 / 5.0
Information Additions are done after delay involving a monitoring process	1.7 / 5.0	2.4 / 5.0
Users can interactively edit existing content on the site	1.0 / 5.0	2.5 / 5.0
Users can rate the information on message boards	1.0 / 5.0	2.4 / 5.0
There is a hierarchical structure of users and administrator(s) or other posts	5.0 / 5.0	2.9 / 5.0
The hierarchy / user reputation is based on an interactive ranking method within the system	1.0 / 5.0	2.1 / 5.0
Updating information is the work of a few repeat users	4.7 / 5.0	2.9 / 5.0
A CKR exists	3.7 / 5.0	3.6 / 5.0
The CKR is interactively updatable	1.0 / 5.0	3.3 / 5.0

Information is being added into the CKR from message boards or other forums	1.0 / 5.0	2.4 / 5.0
Dated or otherwise useless information is removed by administrators	2.3 / 5.0	2.4 / 5.0
Dated or otherwise useless information is removed by an consensus process that involves more than one user	1.0 / 5.0	1.9 / 5.0
Interactive sections are assessed / contributions are weighted	1.0 / 5.0	2.0 / 5.0
Weighting is done equally by all members	1.0 / 5.0	2.0 / 5.0
Weighting is done by members according to an internal hierarchy	1.0 / 5.0	1.8 / 5.0
System of experts is set up for assessment of information in sections with interactive information	1.0 / 5.0	2.1 / 5.0
Assessment of interactive information is possible on basis of general knowledge	1.0 / 5.0	1.5 / 5.0

We found that several sites scored high on particular elements that were valuable in the kind of collaborative system we conceive, but none fit the bill perfectly. Discussions on these forums were very interesting, some showed clear trends of evolving over time – both the topics of interests and the communities themselves change. Sites had a numerous of features, ranging from the more obvious and ubiquitous services (such as mailgroups) to more sophisticated communication channels that could be regulated at the user-level or topically, an example being restricted chat sessions.

Certain sites had fairly fixed infrastructures (e-learning sites, for instance), other sites were extremely malleable (wikis). In general, the size of the communities was an essential feature. While the "effectiveness" in knowledge sharing of sites cannot be measured without an intensive survey of participants, it could be said that sites where the level of expertise of individual participants was difficult to measure (such as the Internet Movie Database) benefited immensely from having a very vast user-base, to ensure better eyeballed updating and counter-checking of information uploaded onto repositories.

Depending on the level of moderation, either by individuals or by the entire community, the level of value in terms of both relevant and updated information created within these applications tended to vary – none of the applications we surveyed was able to facilitate a both a highly dependable and a non-hierarchical distributed system of information management.

In general, the sites scored better on user-interface and design than on interactivity and knowledge creation. The e-learning sites are hierarchical by definition, usually led by individual instructors. Such sites show high levels of interaction, often high levels of activity in knowledge repository creation, largely because of the proactive intervention of moderators such as the instructors.

The human intervention in moderated e-learning sites creates some advantages – information is more likely to be updated more regularly, highlighted when new, and tested for reliability. E-learning sites were also easier to use for first-timers, and were more likely to highlight features than the other sites surveyed. It could be inferred that the individual responsibility in maintaining content, usually tied to an economic relationship, has an effect on monitoring for content veracity.

In contrast to e-learning applications, other groups or websites that did not have moderators tied into an economic relationship showed greater decentralization and participation. These sites scored higher points in almost all categories measuring interactivity.

In terms of the services available, some trends are seen (within the given small class size). Message boards are almost ubiquitous, but mechanisms to maintain knowledge repositories are not. With the exception of wiki, none of the interactive repositories of knowledge had an open-source code. PlumTree offered part of its code to manipulation.

The Internet Movie Database (IMDB.com), which is almost entirely user-updated is possibly the most comprehensive single database of cinema information on the Internet, though it runs on a fairly stringent hierarchical structure of information verification. In contrast, Wikipedia (wikipedia.org) did not have a stringent information verification system, and took a structure of its own, though fairly expansive as a dictionary.

The two make an interesting comparison – the controlled nature of IMDB ensures that information of a 'popular' kind would be subject to moderation by individuals working for the organization, whereas the corresponding 'popular' information on Wikipedia was subject to interactive moderation by users. Similarly, more esoteric films and cinema information can be speculated as having lesser moderation or checking by the IMDB moderators (there were commonly incorrect reviews or incomplete film information), just as the Wikipedia was prone to incorrect information in the less popular areas of the site. Interestingly, in both sites, there is an informal hierarchy – some users were high contributors. In both sites, the easiest way for new users to gain a piece of the 'information production' pie was to become contributors in the more esoteric regions of the site and work up reputations.

5 Finnish pilot plan
(this plan was not approved for funding by Sitra)

BACKGROUND AND DEFINITION OF THE PILOT THEME

Finland is internationally known as an exemplary country of an information and welfare society. Changes in our working environments, however, create a challenge in maintaining our exemplary status. The ability to serve average citizens better and better requires new innovations and new ways of solving the existing problems.

A new wave of welfare society is forming amidst our society run by the global economy. This new wave unites a strong community and open activity culture, cooperation between different participants in producing services to people, and utilizing new technology in the equipment, work and activity methods. The generation of remarkable innovations is enhanced by desire and skills to unite information and different experiences of different science departments and society agents in a new way.

The main challenge in Finland is the annual growth of the elderly target group. According to statistics, the growth of the number of the Finnish people over 65 years old will be over 50 per cent in twenty years. The biggest threat to our welfare society is therefore posed by the expenses created by our ageing population. Every year that people can spend independently in their homes, compared to elderly accommodation, constitutes remarkable savings to provinces – not to mention the improvements in the quality of life. Despite this, specifically the public services for the elderly have been cut down in order to ensure savings in province economies.

In time, the Finnish elderly and health care system, now preparing for the vast ageing of the population, has become an efficient system that systematically takes care of patients. Robotic nursing leaves the elderly without interaction and genuine care. At the same time, the model of producing welfare services has changed from the mechanic, sectored model into a distributed and autonomous one. Provinces and elderly care employers recognize that new ways and innovations are needed to make the work easier, but at present, they do not have enough resources for new experiments. As problems and challenges alter, those working with these environments should change and be open to new people and methods.

In addition to ageing, another challenge is the role of the elderly as active citizens. Years of experience and silent information is often left unnoticed. The main reasons for this are the facts that the elderly do not have means to document and distribute their information, and that there are no natural interaction forums between the elderly and the younger future experts.

According to the conversations with the regional participants and our research group as well as the grounds mentioned previously, the main target group and theme of the Open Innovation Networks project Finnish pilot were planned to be the elderly and creating new innovations for elderly care.

The main development goals can be summed up as follows:

The goal of the possible upcoming pilot project would be to test the open innovation networks method in practice. The experiences and development ideas gained in two year project can be further utilized in improving the entire method and spreading it to other sectors of the society as well as to different environments.

Main problem: Due to the growing number of the elderly, the pressure to develop the elderly care becomes bigger. Especially new solutions and activity methods for better utilization of resources are needed. One of the main problems of the elderly care is loneliness. In this case and others, there is also a lot of potential knowledge to be learned from the patients and other users of the services.

Main intention and goal: To create a new kind of activity method for generating new innovations, collecting information and strengthening the interaction and cooperation of different parties in the elderly care. The goal of the pilot project is also to generate new solutions to problems in the elderly care and to create new knowledge and good practices which can be shared through "The Social Web" and seen in day to day practices on a local level.

Values:

Building a new activity culture should be based on values which are defined together. Values create a basis for choices made during the activity. They also guide the creating process of the leading thoughts in the pilot project. The most important values in the Finnish project are:

- *Openness*, open communication, trust within the participant group and a holistic viewpoint in solving the problems regardless of industry and regional boundaries.

- *Commitment*, to achieving the mutual goal and desire to come up with real practices.

- *Creative working culture*, a new approach to development work, learning to get away from the old practices, making bold experiments without fear of failure.

Values would be first reviewed when the pilot is launched by a design team yet to be founded.

The Finnish project plan is such that it is possible to start the activity presented in the pilot independently in different locations. The pilot plan is therefore carried out according to the idea of the open source code. The material is open to everyone interested and willing to use it. One critical component of the design is to include a CCoP system to facilitate best practices sharing across the different sites.

MAIN CHALLENGES IN ROOTING THE OPEN SOURCE CODE PHILOSOPHY INTO THE PROBLEM OF THE ELDERLY

The open source code method sets challenges to the participant networks, creating new tension into the traditional innovation activity:

1) Activity and results must be open to everyone
   The open development networks must utilize all channels of communication and interaction, so that everyone has the chance to receive information, participate and comment on the development work. Creating genuine interaction requires active critical masses.

2) Participants must be motivated themselves
   One can't be an active participant merely on behalf of the assignment, but each contributor must have the desire and enthusiasm to be involved in the development work. Time and resources must be used in finding and motivating the right people in order to ensure good results of the activity. Attention must be paid in generating enthusiasm and creative tension especially in the launching stage of the activity.

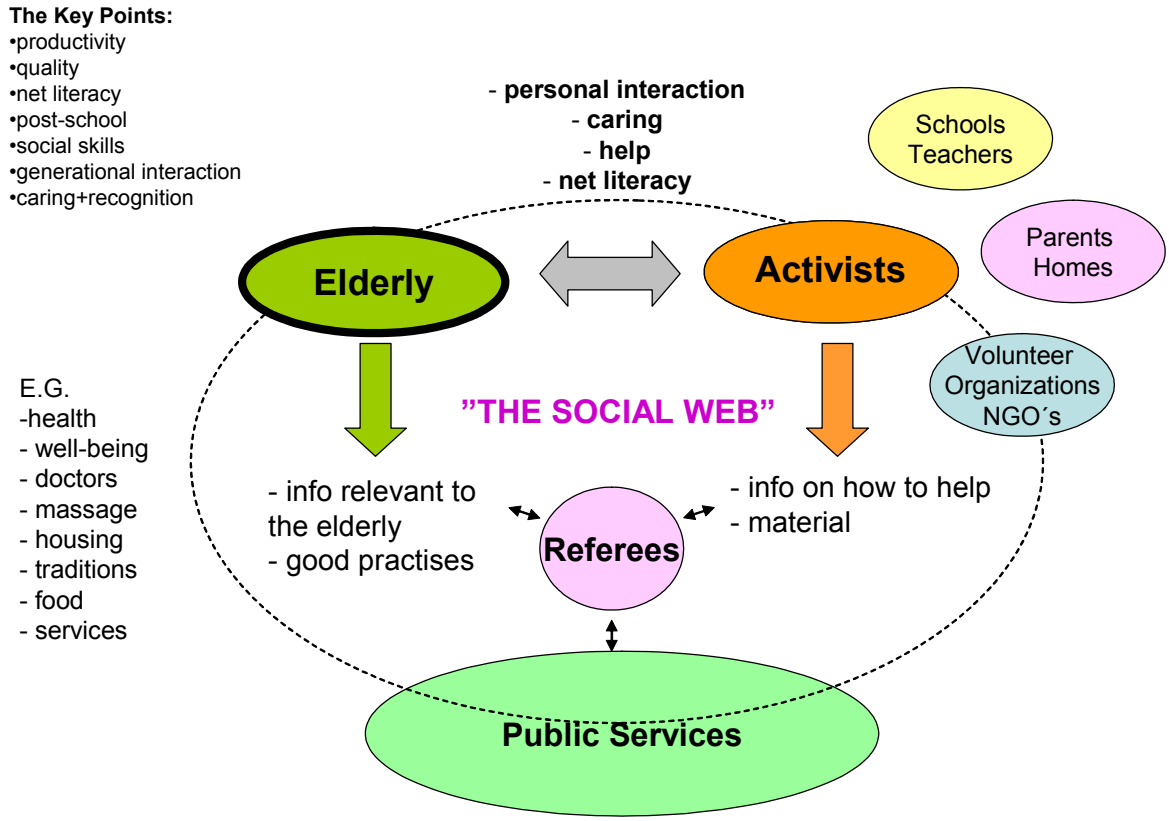
3) Generating creative tension
   Shared vision of the common mission among all participants must be created to ensure the first practical successes. This also ensures the motivation of the participants; everyone knows the direction. Problems should not, however, be defined too strictly, as it might easily lead to shutting out potential cooperation partners, solutions and adaptations. Creative tension in the open activity method requires new kind of leadership in which individuals and their networks have a strong feeling of participation and making a difference.

4) Utilizing different tools in many ways
   In technological innovations, using the world wide web as a development tool has been a clear choice. When we turn to creating social innovations, we must also adapt the other existing tools in documenting information, ideas and discussions. Experiences show that generating genuine interaction through web discussions is difficult and requires considerable net literacy. We will test and refine the CCoP methodology as an ongoing part of the pilot.

PILOT PROJECT STAGES

The Finnish Pilot main target group consists of the elderly and the main problem is developing elderly care. The Finnish pilot activity method could be launched simultaneously in two areas.

The pilot activity method is illustrated in the picture (see next page) showing that the central part of the method consists of the new social activists group, i.e. interpreters. The pilot carried out in Finland wants to make the activists' work open and give different groups an opportunity to be part of contributing to the development work.



Picture 1. The Social Web for the planned Finnish Pilot

In the Finnish Pilot there could be experimented different kind of groups as the activists. Three key elements in electing the activist groups are 1) Motivation to interact with the elderly 2) Ability to bring new viewpoints to solving the problems of the elderly care 3) Basic net literacy and access to the web. Therefore, the activists are not necessarily expected nor required any professional knowledge or expertise of elderly care or health care.

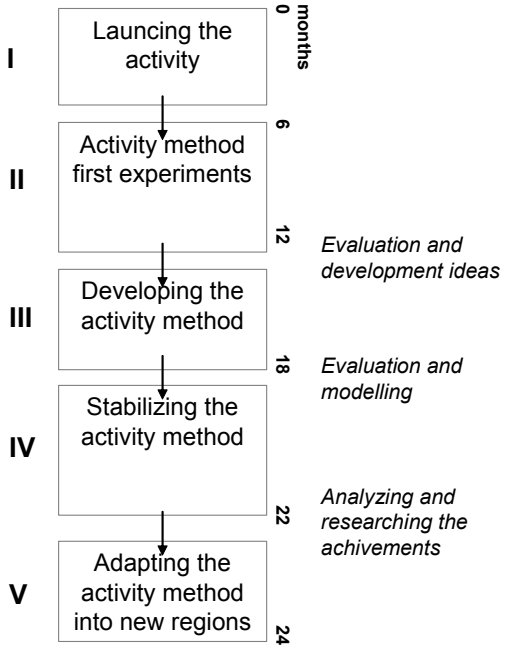
Potential activist group definitions, e.g.

- polytechnic students (students of health care, counseling etc.)
- school children
- conscientious objectors (of military service)
- young long term unemployed
- citizen organization volunteers
- young entrepreneurs
- close relatives of the elderly

A complex group consisting of public administration officers, health care professionals and representatives of citizen organizations, schools and companies, functions as *referees* in this method. A separate design team is in charge of the pilot's monitoring, evaluation and development on a national level.

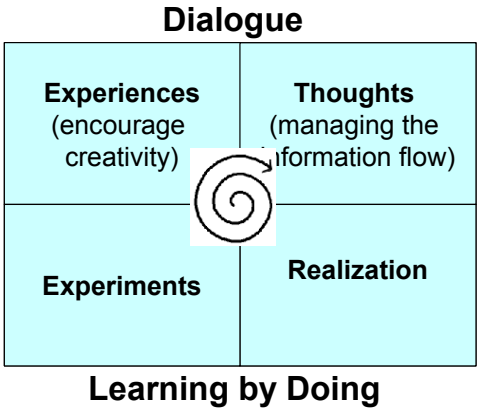
The Finnish pilot is designed as a one and a half year (18 months) development project, the aim of which is to pilot a new open innovation networks activity method in Finland as well as to launch an innovation cycle through a new activity method in local pilots.

The Pilot development stages are divided into the following five stages:



Developing the new activity method requires constant comprehensive evaluation and research. The most important evaluation and development stages come after the first experiments and before stabilizing the activity method.

The main frame for the activity in the pilot is the so called Knowledge Theory based on i.e. the theory on creating new information by Nonaka and Takeuchi, and Partanen's Intelligent Business Model (see next page). The process-like alternation of dialogue and learning by doing is essential in this model. In the development process, key personas of different levels must be encouraged to participate actively by explaining their own thoughts and views. Through these thoughts, a new understanding will be formed, based on which different models and solution suggestions can be generated. The realization of the plan takes place in doing practical things together. Experiences and thoughts are brought to conversations, due to which plans can be further developed.



Picture 2. The knowledge theory, based on Nonaka & Takeuchi (1993) and Timo Partanen (1999)

THE FINNISH PILOT PRACTICAL PROCEDURES IN STAGES:

I Launching the activity

The goal of the first stage is to form a solid basis and culture for cooperation in the pilot areas and between different regions. The first stage takes approximately 3 months.

National design team
A national design team is founded for international cooperation, national monitoring and evaluation of the method. This group consist of 5-7 representatives, pilot area coordinators (2), administrative members (2-3), and outsider experts (1-2).

The design team is in charge of the project activity plan updating and functions as an expert group while evaluating the effects of the pilot's stages and its development.

1.2. Gathering regional activity groups

Regional activity groups are gathered to each pilot area, including representatives of authorities, officers, elderly care staff and employees, schools, companies and citizen organizations. Personal invitations are sent to group members.

Regional project managers are in charge of the coordination of activity group assignments. The task of the activity groups is to be in charge of the regional cooperation networks and communication. In generating innovations, referees with essential roles are chosen primarily amongst the representatives of the activity groups.

1.3. Launching the activity in different regions

In the first stage of launching the activity, the elderly care network is mapped in the regions and essential questions and problems in the activity are charted.

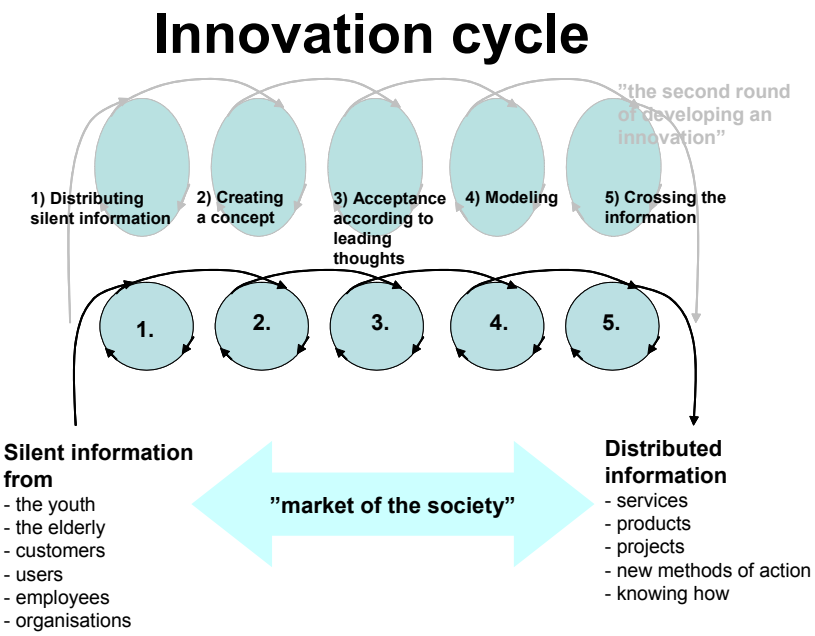
In this stage, the regional groups of activists / inverters are collected from the existing networks and by open invitations. In these groups, regional leading thoughts are defined (mission, values and goals) as well as responsibilities and practical assignments of the participants.

Documentation tools
In this stage, the first draft of tools used in the documentation is created, and training is offered on the activity method. The coordinators of pilot projects will work as the main consultants.

Communication supporting the activity
The launching of the activity method is supported by open multidisciplinary communication. Officially, the project is made public in different locations at the end of the launching stage when the participants are ready to start learning by doing.

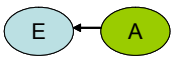
II Activity method first experiments

In the second stage, the actual activity in pilot areas is launched. In the activity, start and development of a process resembling the picture above, The Innovation Cycle (see next page), is sought. The problem to be solved in The Innovation Cycle proceeds in stages and develops on each cycle.



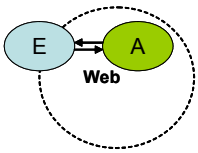
Picture 3. Innovation Cycle , Olli Leppänen citing Nonaka & Takeuchi (1993)

The goal of the second stage is to generate practical experiences in the model and create concrete development ideas.



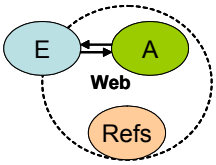
2.1. Contacts and creating interaction

According to Social web model (picture 1.), activists form personal they document their discussions. The most important thing is to create a natural interaction. In other words, this is not an interview or inquiry, but a meeting of two people.



2.2. Documentation and web publishing

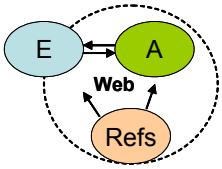
Meetings and thoughts that have come up in them are documented and published in the web. In this stage, anyone can ask questions, present ideas and engage in conversations about the thoughts.



E = elderly
A = activists
Refs = Referees

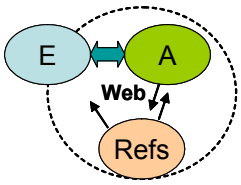
2.3. Discussions and bringing up problems in referee groups

Local referee groups get together approximately once per month to exchange thoughts on ideas and web conversation topics. The referees' job is to support the early stages of the process and bring their own viewpoints in order to develop the contents. The referees can distribute their own questions further.



2.4. Sharing ideas and experiences

Open meetings are organized locally to share and further develop ideas and experiences. The participants present their own experiences and development ideas they have come up with. The goal of these meetings is to deepen the common understanding of the method and simultaneously give broader information on the project after first experiments.



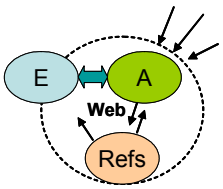
2.5. Strengthening interaction and the second cycle of innovation
After receiving development ideas, the second cycle begins. During this cycle, questions and development suggestions by the referee group are brought up in the dialogue with the elderly. The results are documented in the web where activists, referees and everyone interested can continue discussion, commenting and further developing new thoughts. In this stage, it is important to encourage people to make creative choices and ideas.

2.6. Practical procedure suggestions and analysis
Development ideas are handled and analyzed in referee groups on local levels and brought to everyone's attention as concrete suggestions to key people in a seminar. Within the resources used by local participants, experiments of new ideas are supported.

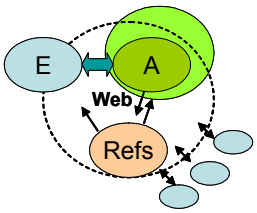
2.7. Evaluating the method on a local level
To end stage two, an evaluation is made of results and function of the method on a local level.

III Developing the activity method

In the third stage of the pilot project, the main goal is developing the method based on the evaluation and first real experiences. In this stage, the participant groups are expanded and their communication is broadened on a national level. This stage will take approximately three months.



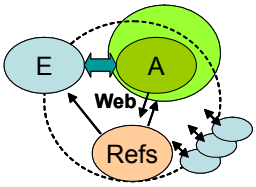
3.1. Open recruiting and communication
Information on the interim results is given on a national level. At the same time, participation of the contributors interested in the same theme is declared open. The experienced gained in the first experiments are modeled into a short guide for newcomers.



3.2. Committing local organizations and companies to the method
Based on the results from the first experiments, regional and nationally important companies are taken on more closely with the development of the method. Simultaneously, volunteer organizations and other the method.

3.3. Strengthening the method and analyzing tools
Gathering new innovations and interaction between the activists and the elderly continues. Simultaneously, tools and best procedures are developed.

3.4. Experimenting practical innovations and development ideas
The development of new ideas generated by the method requires their realization. Local activity groups and referees are responsible for turning ideas into practice. The innovation cycle is sped up by increasing and strengthening interaction between the regions.



IV Stabilizing the activity method

In the fourth stage of the pilot project, the activity method is stabilized as part of regional innovation and decision making system. The method its own place in each region in the light of the experiences.

This stage will take approximately only three months. Simultaneously, a broad national level research will be carried out on the concrete local innovations and experiences generated during the pilot.

V Adapting the activity method into new regions

In the last stage of the project, it is essential to analyze the results and spread the experiences of the method both nationally and internationally. The ideas and best practices which have been developed in the Social Web will be edited into a book, Pekka Himanen as the editor.

In the last stage, a broad seminar is carried out, in which the results and experiences of the pilots in California and Finland are presented.

CHOOSING PILOT AREAS AND THE CRITERIA

In mapping and choosing the pilot areas, the following four requirements of innovative environment should play a role:

1. Participants: identity, feeling of belonging and charisma
2. Networks: connections, trust and mutual dependency relationships
3. Knowledge leadership: information flows and communication
4. Timing control: situation awareness and courage to act
5. (Sotarauta & Ståhle, 2002)

And also the following factors should be taken into account in choosing the pilot areas:

- The region's key people and their innovative spirit
- Commitment, willingness to put time and effort in trying something new
- Critical masses in creating a process with interaction
- The existing nursing networks and projects
- Experiences in open development work

PROJECT ORGANIZATION

The Finnish National Fund for Research and Development could be in charge of the realisation of the project. A project manager responsible for coordinating the pilot project could be hired. He would function in a close cooperation with the Design Team responsible for developing the method nationally and for international connections. Regional workers for local pilot projects should also be hired. The services can also be bought. Additionally, broad expertise will be utilized in research and evaluation. Other participants in this project will not be paid or get bonuses for the time they use.

METHOD MONITORING, RESEARCH AND EVALUATION

Experiences and results gained during the project can be used by all participants.

The project should be evaluated by outside assistance three times. The first and second evaluation is used as a critical self evaluation tool in developing the procedures and results of the project. The final evaluation is to help working the sustainable effects and procedures aimed at structures, as well as spreading results and good practices. Interim goals are set for the project for regular monitoring. Right things should be done at the right time.

The achievements can and should be analyzed in many different levels. These levels are:

1) The project as a whole – realization of goals
   If the activities carried out during the project are in accordance with the plan, the project will reach the set goal. Reflecting the activity on goals also helps to see those parts of the project and method that need to be analyzed and further developed.

2) Process based analysis – achieving the goal
   Every process in the project has a concrete destination and goals which must be reached by the time the project ends. In practice, this means:

   - Committed and motivated citizens take part in carrying out the social web method.
   - New ways to create interaction are generated with he help of the method.
   - During the project, concrete innovations generated by the method are carried out.

CHALLENGES

It is always a challenge to start creating a new kind of activity method which generates a totally new innovation culture in Finland. The key people are required an extremely solid faith, professionalism to see the entity and vision based on it. The project also needs enough time to evolve, and the results followed by it must be monitored during a longer period than merely the first year.

The biggest risks and errors can be avoided by careful planning and using only skilled professionals.

To ensure success, the project must meet three main points:

1. Full commitment of the key people
2. Activity and economic resources
3. Proper time resources

The basic philosophy of the social web method and understanding the tools related to it form a basis for launching the project and making it a success. There are no shortcuts in this stage. Matters must be dealt with so long that everyone involved in developing the activity understands the nature of the project both in theory and in practice.

Learning to get away from old practices is also a risk. The new activity method can very well work in practice on the viewpoint of one specific process, but the successfulness of the entire method is a prerequisite for making the project vision come true.

6 California pilot

As part of the project's identification of appropriate test beds, we approached the Central Valley Partnership (CVP), a loose collaboration of over a dozen organizations whose aim is to increase civic participation among migrants, immigrants, refugees, minorities, youth and women in the Central Valley of California—a 450-mile-wide region that produces about one-quarter of the U.S's agricultural products and is the most ethnically diverse rural region in the country.

Founded in 1996 and underwritten through the assistance of major foundations, the CVP came together to strengthen and enhance collectively the efforts made by each group individually. The partner organizations seek 'to create an environment where members can learn from one another, form joint projects, and organize efforts' that lead to social and institutional change. The partners consist of groups that do community organizing, provide legal assistance, popular education, and direct social services, along with media, youth empowerment, and applied research organizations.

We chose the CVP because, not only did it meet the project's criteria, but also because it sees itself as a 'learning collaboration' and is engaged in civil sector work. We interviewed 10 of the partner organizations who had expressed an interest in participating in the project along with funders and CVP leaders. We looked for:

Commitment and the belief that participating would provide benefits to the group and advance its goals

- Sufficient resources from the group in terms of providing dedicated time and effort to the project
- Access to technology
- Comfort with partnering with BCIS i.e. would be willing to work together the design the systems that would have the most meaning and make the most impact for the group while within the parameters of the project

We also incorporated criteria relevant to the CVP in making the final choice:

- The group chosen should benefit the CVP as a whole, not just the individual organization
- The group should represent the ethnic diversity as well as the geographic spread of the Central Valley
- The group should be comfortable making the resource commitment to the project

Factoring these criteria together, the group that met them all to the highest degree was the Immigrant Leaders Fellowship Program (ILF). The Program 'supports and trains emerging immigrant leaders committed to organizing effective civic action' in the Central Valley. Each year, in September, the ILF selects an incoming cohort of fellows, nominated and sponsored by the CVP partner organizations. During the course of the year, each fellow selects and works on a project with his/ her sponsor organization. The fellows meet together on a regular basis, usually

monthly, to discuss progress and problems as well as to design and coordinate the annual Leadership Institute, which occurs at the end of their year as fellows.

Fellows are selected based on their dedication and effectiveness as leaders within their communities as well as their knowledge, vision and ability to participate in the program fully for the year. During the inaugural year, 2001-2002, projects ranged from research to grassroots organizing around such issues as public health and cross-cultural exchange. In 2003, increased funding resulted in a doubling of the number of fellows selected, from 8 in the first year to 16. The Program has a full-time, dedicated Director who will be the project's primary contact. The fellows determine how to shape their program year: they decide what they want to learn, establish the norms for their community, and select the themes for their Leadership Institute. They will be integral in deciding the functionalities of the software for the project.

Between the monthly face-to-face meetings, fellows do not have regular contact with each other, in part because they are geographically dispersed. Much of their work is done purely with the sponsor organization and, more specifically, with the designated mentor within the organization. Thus they lose opportunities to learn from one another by sharing in-depth and in real-time challenges, concerns, and opportunities as well as approaches to their projects. One of the most common themes voiced by the outgoing cohort was that they wished they had had more time for relationship-building and better communications systems. As more and more cohorts graduate, key issues for the ILF will be how to create an alumni network that can foster relationships, within and across cohorts, and how to develop and maintain a learning repository and history of projects completed.

The lack of continuity between the meetings also results in lost time as some portion of every meeting is spent reminding fellows of decisions made previously. This has a particularly negative impact when designing the Leadership Institute. Last year the planning process had a 'one step forward, two steps back' character because there was no mechanism to capture and disseminate key decisions on an ongoing basis. Capturing what was learned (what worked, what didn't) would help future fellows in both in their project work as well as for the Institute.

The goals of the ILF for the project in the short-term are:

- To enhance the relationship-building and communications component for fellows between face-to-face meetings
- To streamline communications and feedback between fellows and their sponsor organizations/ mentors, advisors, and the ILF staff
- To foster collaboration and cross-project learning via sharing project plans and outcomes throughout the year
- To streamline the design and coordination of the Leadership Institute

In the long-term, the goals achieved would be:

- The development of a strong alumni network
- The creation of a database of projects completed, consisting of descriptions, processes, and outcomes
- The creation of a learning repository that highlights key decisions and solutions to commonly experienced challenges as well as provides insight into the planning choices to be made by future cohorts
- The establishment of an assessment and evaluation component for both the ILF program as well as its participants

The project could help the ILF achieve these goals through the creation of a mechanism for capturing, disseminating and building on information in a way that is useful to the fellows. It will

require the fellows or some designated representative(s) determine a) how to organize the information in a way the group deems beneficial to it and future cohorts and b) shape the information in order to glean from it what the group determines to be the key insights.

Some of the specific mechanisms fellows could adopt to use the project tool to meet the goals are:

- Posting of brief biographical sketches/ photographs of each flow
- Posting of plans—including drafts—for feedback from fellows, advisors, and mentors
- Forums for discussion of challenges and opportunities as well as questions and problems
- Resource lists of people, organizations, and useful reference materials
- Listing of community events/ a calendar of events posted by fellows to inform and invite one another to events organized by each other

The final list of mechanisms will be developed by the BCIS project team and the fellows. As a preliminary step, we have established an Intranet for the current ILF fellows.

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Addendum

COMPARATIVE STUDY OF ALL SURVEYED APPLICATIONS

CMB – CMU Blackboard
UNX – University of California, Extension
CAT – Catalyst, Haas School of Business
EAV – E-learning Sites Average
INT – Intranets.com
WIK - Wiki
ABZ – NYT Abuzz
PT1 – PlumTree – Out of the box
PTC – PlumTree - Customized
YHG – Yahoo Groups
IMD – Internet Movie Database
DSM – Dream, SIMS Berkeley
CAV – Collaborative Sites Average (non e-learning)

	E-LEARNING					***COLLABORATIVE INFORMATION SHARING***								
	CMB	UNX	CAT	***EAV***		INT	WIK	AUZ	PT1	PTC	YHG	IMD	DSM	***CAV***
INTUITIVE DESIGN AND LOGIC														
Clear Usage Instructions for First-Time Users	4	5	1	***3.3***		2	2	3	2	4	1	3	5	***2.8***
Intuitive Panels for Links	3	4	3	***3.3***		4	3	3	3	5	3	3	3	***3.4***
Guided Tour Option	1	5	1	***2.3***		1	5	1	2	3	1	1	1	***1.9***
Non-redundant links	3	5	5	***4.3***		3	4	3	3	5	1	3	3	***3.1***
Navigation Systems Consistent	3	5	5	***4.3***		5	4	5	3	5	3	4	5	***4.3***
New information highlighted	5	4	1	***3.3***		4	4	4	3	5	1	1	1	***2.9***
Site has an open source design	1	1	1	***1***		1	5	1	1	3	1	1	1	***1.8***
Major structural and design changes can be done by users	1	1	1	***1***		1	2	1	1	1	1	1	1	***1.1***
VISUAL DESIGN														
Text Legible	5	5	5	***5***		5	5	5	3	5	5	5	5	***4.8***
Graphics are used only where necessary	4	4	5	***4.3***		5	5	4	4	5	5	3	3	***4.3***
Screen Optimized for Minimal Scrolling	3	4	5	***4***		3	2	1	4	5	3	3	3	***3***
Speedy Download for Narrowband Users	4	4	3	***3.7***		3	5	3	1	3	5	2	3	***3.1***
Functional basic services for low-proficiency users (someone with just the ability to login can interact effectively)	3	3	1	***2.3***		1	4	3	2	5	3	3	4	***3.1***

INTERACTIVITY AND CONTENT														
The site is amenable to large additions of text and other data content	5	1	3	***3***		5	5	4	5	5	1	1	1	***3.4***
There is a specific “links” section where users can add links	3	3	1	***2.3***		3	4	1	4	5	5	1	1	***3***
Message boards allow users to add and reply to text	5	5	3	***4.3***		5	4	5	5	5	5	5	5	***4.9***
Information Additions are done immediately	5	5	3	***4.3***		5	5	5	5	5	3	3	5	***4.5***
Information Additions are done after delay involving a monitoring process	1	1	3	***1.7***		1	1	1	2	5	3	5	1	***2.4***
Users can interactively edit existing content on the site	1	1	1	***1***		3	5	1	3	5	1	1	1	***2.5***
Users can rate the information on message boards	1	1	1	***1***		1	3	5	1	4	1	3	1	***2.4***
There is a hierarchical structure of users and administrator(s) or other posts	5	5	5	***5***		3	2	2	1	4	5	3	3	***2.9***
The hierarchy / user reputation is based on an interactive ranking method within the system	1	1	1	***1***		1	1	5	1	4	1	3	1	***2.1***
Updating information is the work of a few repeat users	5	4	5	***4.7***		4	1	3	3	2	4	1	5	***2.9***
A CKR exists	1	5	5	***3.7***		5	5	5	1	4	3	5	1	***3.6***
The CKR is interactively updatable	1	1	1	***1***		5	5	4	1	4	1	5	1	***3.3***
Information is being added into the CKR from message boards or other forums	1	1	1	***1***		1	5	5	1	4	1	1	1	***2.4***
Dated or otherwise useless information is removed by administrators	3	3	1	***2.3***		1	2	1	5	3	1	5	1	***2.4***
Dated or otherwise useless information is removed by an consensus process that involves more than one user	1	1	1	***1***		1	4	1	1	3	1	3	1	***1.9***
Interactive sections are assessed / contributions are weighted	1	1	1	***1***		1	3	2	1	4	1	3	1	***2***
Weighting is done equally by all members	1	1	1	***1***		1	3	4	1	4	1	1	1	***2***
Weighting is done by members according to an internal hierarchy	1	1	1	***1***		1	1	1	3	3	1	3	1	***1.8***
System of experts is set up for assessment of information in sections with interactive information	1	1	1	***1***		1	2	1	3	3	1	5	1	***2.1***
Assessment of interactive information is possible on basis of general knowledge	1	1	1	***1***		1	1	1	3	3	1	1	1	***1.5***