



Fostering an Innovation-Supporting Environment

by Sebastian Konkol

I have witnessed the widespread belief that innovation is about having some brilliant people on board. It is enough to let them learn, and — sooner or later and due to unknown reasons — new ideas simply will arise. Of course, you can get lucky with this approach, but are you ready to depend on luck alone? This article focuses on some aspects of innovative team formation that allow organizations to consciously stimulate and control team cooperation.

WHAT IS “INNOVATION”?

The term “innovation” has become quite fashionable these days. Every company or organization aspiring to gain or hold some meaningful position in the market is forced to “be innovative” — if it is not, it is out. As with any term that is mainly a tool for marketing campaigns, the meaning of “innovation” has evolved during the last few years and become very ambiguous. Currently, it means so many things that talking about innovation in IT makes quite limited sense unless we get to a more precise definition of the subject under discussion.

As presented by Wikipedia, innovation is, among other things, “the process of making improvements by introducing something new” or “the successful exploitation of new ideas” [10]. First of all, innovation should be distinguished from creation (the things usually undertaken within the scope of marketing activities such as brand development). Innovation is a solution previously not known for a certain known problem, rather than a vision of something completely new. Secondly, the act of innovation should be distinguished from the process of innovation diffusion [5]; the organization that is able to innovate is not necessarily the one that accepts and adapts to any new idea introduced. Such a distinction is important to notice, because while both innovation and innovation diffusion require a kind of group behavior to happen, being innovative requires quite different qualities from the individuals involved than merely being open to innovative thinking.

No matter how the term “innovation” is understood, fortunately no one questions the need for an enterprise

to innovate. The market demands that companies implement continuous improvements, so innovation is a necessity, not a privilege. The question is whether becoming innovative is a matter of luck, or can its appearance and growth be stimulated somehow?

“WE DO INNOVATION!”

Now, I can hear managers clamoring: “We *do* care about innovation — we train our staff, make their competencies grow, help them to gain experience, and create career formation opportunities!” That is all well and good, and it truly represents the set of activities that are being undertaken by companies’ managers to build — in their belief — an innovative environment. Nevertheless, all those activities focus on individuals and their skills rather than the company’s capabilities. Today’s innovations (especially in the field of IT) hardly ever depend on wisdom from a single area of knowledge. Their emergence requires the cooperation of people who possess information from various fields and are able to exchange it efficiently. It soon becomes clear that innovation development is a kind of social process. In searching for an organization’s innovative capabilities, the focus is moved from individuals’ and departments’ capabilities to cooperating groups — this is a network potential view instead of just a list of individuals compiled with no concern for the relations between them.

The new focus lies in emphasizing communication over knowledge. I do not mean forgetting about knowledge entirely and focusing on communication only. All those attributes and capabilities that make up a good expert are still necessary and should be valued. After all, if some part of the work requires expertise in the IT knowledge area, it definitely cannot be done without engaging such an expert. Subject matter expertise and skills are fundamental and necessary for innovation to happen, but knowledge that cannot be communicated is rather useless.

I have seen many organizations truly striving — not merely proclaiming — to be innovative. They have trained their employees, promoted self-learning, and

recognized exceptional achievements. They have created brilliant experts and great intellectual potential, but they could not get repetitive innovations to happen. I believe they missed the important issue: that innovation appears *among* people rather than *inside* them. It is developed in the course of cooperative work and, as such, places demand for appropriate behavior on each coworker. For example, if Jack's achievements declare him the most knowledgeable expert in IT, he can be sure he will take part in some group endeavor requiring IT expertise. But if Jack's ability to communicate with experts outside the IT area is not good enough, his expertise could become useless for the team. Ability and openness for communication must be taken into account. To take another example, say our expert Jack hates the other needed knowledge area expert, Monika. He might show this by questioning Monika's input, and thus his contribution to the group work could become useless or even destructive.

So, in addition to the previously mentioned hard skills and capabilities, some other skills and/or attitudes are necessary — the so-called soft ones. People's attitudes toward others should be taken into account when engaging in collaborative, innovation-seeking work. Individuals judge a speaker's opinions and competencies, and their judgment can be influenced by their assessment of the speaker as an individual. If a team member strongly dislikes the person speaking, he may not be open to, or willing to accept, the speaker's opinions. Investing in an individual's knowledge and skills while ignoring her group behavior potential is a waste of time and money. If an organization requires innovations to happen, it should be aware of people's abilities and attitudes and take care about group behavior potential in advance.

THE SOCIAL ENGINEERING OF INNOVATION

It would be nice to have something called an "innovation process definition" that would describe the needed actions, roles, tasks, and responsibilities, thereby guaranteeing that, on successful process completion, the organization could achieve repeatable innovation. Apparently, such a process cannot be strictly defined and controlled, but I strongly believe that it is nevertheless possible to foster innovative thinking in organizations. The key issue here is to create an environment in which innovation "processes" can run. What companies should really

do is to focus on groups, processes, and a supporting environment, being aware of the knowledge and competencies necessary for innovation to happen in a certain field — both subject matter knowledge and group behavior.

The simplest recipe is to get applicably knowledgeable people, have them communicate with each other, and make them collaborate on some matter to develop what Peter Drucker called the "change that creates a new dimension of performance" [4]. Standing on the ground of social psychology, and particularly using social network analysis (SNA)¹ as a tool, it is possible to transform this simple recipe into something actionable. These network examination methods allow organizations to analyze and evaluate the level of innovation support among a particular group of individuals and even to optimize the organizational setup in order to make it more innovation-friendly. There are means of determining whether a particular group of people possesses an innovation attitude as a team and of assessing whether individuals are supportive of, indifferent to, or destructive of a particular scope of innovation activities. The network investigation tools will not make any decisions for you, but — if properly used — they will give you sound reasoning for the decisions to be made and awareness of their results.

Since we deal with real people and not simple, deterministic machines, developing something like a completely optimal innovation organization is hardly possible. Nevertheless, we can assess the innovative climate and gain some directions for achieving improvement possibilities, and these advantages make the attempt worth the effort. Based on the results of such an analysis, an organization could tell whether the communication model it currently uses is suitable or whether it should be changed somehow. It could determine who should collocate with whom to speed up the innovation process or what piece of missing knowledge should be added to the team to gain the desired mix.

Innovation, in contrast to design, is something that sparks rather than grows incrementally. Building innovation development capabilities requires careful selection of appropriate people. Organizing for the ability to innovate is a rather complex task and, as with almost every social process, it is hardly possible to generalize or make it algorithmic. Nevertheless, it is possible to organize for innovation, thanks to advances in some

¹Social network analysis is a branch of social psychology that deals with relations among people. It discovers and explains reasons for group behavior, taking into consideration a complete view of relations among the group members. It applies graph theory, both deterministic and stochastic, in order to determine the characteristics of the group as a whole. See [7] for a scientific presentation of SNA and [2, 3] for a somewhat more popular one.

branches of social psychology, cognitive science, and their applied derivatives. I see innovation development as a process of exchanging ideas, and if such a process is to produce expected results (i.e., innovation in the required field), it should be stimulated with applicable knowledge.

ORGANIZING FOR INNOVATION: A TOOLKIT

The general approach to organizing for innovation could be based on a toolkit composed of two pieces: knowledge modeling (the hard skills) and SNA (the soft skills). Such a combination can be used to uncover, understand, and utilize the dynamics essential to the spread of knowledge over a group of individuals in order to make it possible to easily exchange ideas, which is the essence of innovative thinking.

Knowledge Modeling

The first tool, knowledge modeling, should be used as the instrument for defining and categorizing pieces of knowledge at the level of granularity suited to a particular knowledge area. There are applied models, quite commonly used, that can be utilized as the first tool — competencies models² being the most straightforward example. Many companies have used these models for some time in order to assess the knowledge being collected in their organizations. Competencies modeling could be regarded as standard offer for any HR consulting company, and it is sufficiently precise to depict the knowledge kept in and spread over an organization.³ Each time particular knowledge is required to advance innovative thinking on a subject, such a knowledge modeling tool can be used to describe and define the knowledge structure necessary in terms of competencies. It can then match these with the similarly defined competencies of particular individuals in order to select the potential innovators who possess the knowledge required.

Social Network Analysis

The second component of the toolkit mentioned above, SNA, should be used to assess a potential innovator's compatibility with the rest of group. As noted earlier, not only knowledge is important, but also the ability to communicate with others and, especially, one's attitude toward other individuals engaged in the process. Since soft skills could strongly influence value, which is supposed to be added to the innovative team by engaging a potential innovator, the second tool should help the organization gauge the influence this person might exert on the team.

SNA focuses on relations among individuals and, using graphs theory, relational algebra, and statistical analysis, derives characteristics of the group.⁴ For example, by knowing only who talks to whom, we could discover whether a particular bit of gossip told to one individual could reach some others and even calculate the probability and expected time of its getting there. In short, SNA uncovers details of the communication paths that are achievable in the group.

In the case of innovation processes, the important social characteristics to be measured are ability to communicate and attitude toward other experts. The set of data necessary to determine these characteristics could be created by investigating and registering the two parameters' values for each relation in the group of individuals. The investigation itself can be done via the standard means used for psychology studies, surveys, or interviews, and the questioning should be performed by sociology or social psychology specialists. Participants may be instructed to answer yes/no questions, select some subset of possible answers, or rank-order the answers available. By applying SNA to the data thus collected,⁵ the organization can uncover existing capabilities for communicativeness and openness and identify any gaps that need to be closed.

PUTTING THE TOOLS TO USE

Now let's consider some examples that demonstrate the toolkit's potential as an instrument for organizing for

²See the works of Steve Whiddett and Sarah Hollyforde [8, 9] for examples applied to human resources management.

³Ambitious managers could go even further and attempt a more scientific description of human knowledge, utilizing human memory and knowledge storage models like HAM (Human Associative Memory, see [1]) or Semantic Web definition endeavors, which try to model the meaning of data and knowledge.

⁴For SNA applications, see [3]. An interesting view on social network structures applied to management and organizational structures can be found in [6], as well.

⁵Giving this precise explanation for the analysis to be performed is a rather complex task, and its complete description would exceed the scope of this article (see [7]). Fortunately, there are applied methods of SNA that give results precise enough to be used for the purpose being described here (see [3]).

innovation. I will start with a quite typical managerial decision: “Whom should we choose for a particular innovation generation process?” In such cases, a manager could take the following steps. Based on the competencies (or roles) that have to be represented in the innovative team (e.g., experts on nanotechnology and brain structure), he could identify suitable candidates. If there is more than one candidate for some role — say, one nanotechnologist and two brain structure experts — then two different “configurations” are possible (the only nanotechnologist with each of the two brain structure experts). Each configuration could represent a different level of expertise (the first brain structure expert is a bit more experienced) and a different ability to cooperate, as determined based on the parameters registered for relation between the individuals in that configuration (the first brain structure expert hates the nanotechnologist). Taking into consideration both the needed knowledge *and* the ability to cooperate, the manager can choose the better configuration (probably the first configuration would not make sense at all).

In real cases, these configurations are much more complex, and the best choice is not so easily visible. In such instances, relational algebra should be used to present possibilities for cooperation and possible obstacles to it. Again, organizations will want to incorporate social network features such as an individual’s ability to communicate and the attitudes attributed to relations among the individuals.

Another example concerns the ability to speed up the needed knowledge exchange by optimizing the communication among participating experts. In such a

case, the subject of analysis is the acts of communication (memo exchanging, meeting attendance, project team participation, etc.) between individuals. Each act of communication between two experts could be represented as the creation or strengthening of the communication relation between them. The whole set of such relations represents the communication network between and among the experts involved, and their existence and length, among other characteristics. If, in order to innovate for some purpose, particular cooperation should take place, the network view presents the communication paths that should be shortened to speed up the work’s progress. For example, it might indicate what kinds of meetings should be initiated or who should collocate with whom.

Again, real-world cases are quite complex — they require simultaneous changes to many communication paths, and quite frequently the changes required are contradictory and the optimal solution is not simply visible from the network structure. In such cases, organizations can only weigh their options carefully and take an evolutionary approach to change, making each change in an unhurried manner, one at a time, starting with the change that would cause least harm.

The advantage of using the toolkit is the relatively low cost of the surveys by which data is collected for analysis and modeling. A simple, short poll could be designed once by specialists, and response data could be gathered using a simple intranet application. Furthermore, information that is already being collected in the organization could be utilized, and some aspects of the data gathering could even be automated (see the sidebar “The Toolkit Applied” for some ideas).

THE TOOLKIT APPLIED

The toolkit components could be regarded as very abstract, but in fact they are not. Some of them even exist in organizations already and are being used for various purposes:

- **Competencies models.** These models are quite common in organizations, especially in those that are aware of the importance of intellectual capital. There are various methods for competencies classification, and some of them are based on IT architecture frameworks, thus making them applicable for the IT knowledge world. For example, companies in Vodafone Group use their GTAF¹ components to describe and assess competencies possessed by individuals and the IT organization.
- **Acts of communication.** Quite frequently, data on communications is automatically gathered by group work tools in use within the organization, such as e-mail, messaging, and meeting scheduling systems. For example, by registering a meeting request with the list of invited attendees, a number of acts of communication can be counted and attributed to the applicable relations. Many similar means of capturing such information are mentioned in [3].

¹GTAF (Global Target Architecture Framework) is a proprietary framework for defining various aspects of information architecture. It was originally based on TOM (Telecom Operations Map) by TMForum and has been modified to account for IT architecture unification among Vodafone Group member companies. Currently it is being used for architectural skills classification, as well.

MIND THE GOAL

When using the toolkit described above, it is crucial to remember what the goal is. If the organization is to remain innovative, such an innovation-supporting environment must be kept alive. This may entail some periodical reevaluation, with new polling and data analysis, to update the social network view of the group. The new picture of the organization's ability to innovate may require the organization to do some further tuning.

In the same way, if the organization is to be kept innovative, such analysis results must not be used as a reason for taking negative action against individual staff members. The first sign of the organization's intention to punish somebody for missing soft skills and attitudes would make that person's trust disappear, and data collected afterward could become useless. Instead, such results should be used to help those individuals change to fit better in the environment, as cooperative group behavior is key to innovation process success. Alternatively, for a person not suited or unable to adapt to the group dynamics, the same tools might help to determine a task or part of the organization where the individual could play her role effectively.

One more remark must be made about toolkit usage and its results. Humans adapt to changes gradually, and so the process of innovative team formation becomes iterative in character — revolutionary results should not be expected on the first shot. Nevertheless, each successful iteration not only improves a particular team situation, it also enhances the cooperative environment. And this, as I've said, is the crucial cultural component for an organization capable of innovation.

CONCLUSIONS

The ability to innovate is something for which an organization can be designed and optimized. As with many other social processes, it is hardly possible to describe the innovation process in a manner similar to a business process definition. Nevertheless, some aspects of an innovation-supporting environment can be measured (using group member features), and valuable conclusions regarding the group potential can be drawn based on these measurements. To create an innovation-supporting culture, organizations must not only gather data describing the individual competencies available, but also gain an awareness of how these capabilities are utilized, by determining individuals' communicability, their attitudes toward others, and their evaluations of

others' opinions. Sustaining such an environment is even more difficult to achieve, but it pays back in a not-so-distant time horizon.

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