

Innovationroom – a Service for SMEs to Cope with Virtual Innovation Teams

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Abstract

The objective of the study is to increase understanding and knowledge in the field where innovation management practices and physical room facilities overlap in the strategic sense. The purpose is to develop pragmatic, unique and competent management practices for strategic innovation management and business development from the whole company's point of view. In this paper the authors study the usefulness and usability of group support systems (GSS) and innovation management methods in groups particularly in the small and medium-sized companies. According to the authors' findings, applied methods offer many promising benefits for SMEs to find and develop new, profitable business activities. The developed Innovationroom facility could be part of regional services provided by incubators, research institutions, universities, virtual meeting service provides etc.

Keywords

innovation management, group work, group support systems

Introduction

Distributed (innovation) teams have been receiving a lot of attention lately in both the practitioner and academic literatures. While dispersed teams can bring benefits such as increased flexibility they also include challenges such as difficulties with coordination. The coordination challenge is particularly critical for dispersed teams because in addition to accomplishing their ongoing innovation task, they engage in activities that span many boundaries (e.g. temporal, geographical, cultural, and technical). There is thus a view, particularly in the practitioner discourse, that dispersed teams need advanced technologies to accomplish their distributed communication and tasks.

The objective of the study is to increase understanding and knowledge in the field where innovation management practices and physical room facilities overlap in the strategic sense. The purpose is to develop pragmatic, unique and competent management practices for strategic innovation management and business development from the whole company's point of view. The next generation of collaborative working environments are communications-driven, thereby increasing creativity and boosting innovation and productivity.

Innovationroom is a type of group support system that emphasizes communications, collaboration and shared decision-making support. A simple bulletin board or threaded email is the most elementary level of functionality. The system can be defined as software and hardware for shared interactive environments intended to support and augment group activity.

It enables two or more people to communicate with each other, share information and coordinate their activities. Innovationroom is a hybrid type of group support system that allows multiple users to work collaboratively in groups using various software tools. Examples of group support tools in general are: audio conferencing, bulletin boards and web-conferencing, document sharing, electronic mail, computer supported face-to-face meeting software, and interactive video.

The purpose is to provide guidelines for the management of important competencies and their associated technologies. The process helps to analyze and understand the linkages between innovation management and group decision-making. Opportunities for building and managing competencies should be systematically assessed when managing business development in groups. A better understanding of the technological resources and competencies, as well as knowledge embodied in groups in technology management can help to build sustainable competitive advantages.

The developed Innovationroom for SMEs has at least one of the following characteristics:

- Enables communication between groups of people
- Facilitates the sharing of information
- Supports collaboration and coordination between people
- Supports group decision tasks

Key research issues for Innovationroom include impacts on group processes and group awareness, multi-user interfaces, concurrency control, communication and coordination within the group, shared information space and the support of a heterogeneous, open environment which integrates existing single-user applications.

Challenges of Innovation Management in SMEs

New product or service development is extremely important for the future growth and success of all companies. Increased business needs, shortened product life-cycles and intensifying competition drive companies to invest more systematically on innovation management and processes. The trend of tightening competition in markets has had several changes in the way of doing business. That fact is not restricted only high-technology industries or industrial markets. Numerous research has pointed out how essential role small and medium-sized companies have in creation of welfare in society – finally, the results are shown up in employment rates etc. (OECD 1992; 1995) The importance of innovation for economic development is rarely challenged. Innovation is an essential condition of economic progress and a critical element in the competitive struggle of enterprises and of nation states (Freeman & Soete 1997, 1-2).

A Recent study of innovative environments of enterprises especially in South East Finland shows that R&D volume lags still back in SMEs and main innovation actions take place in the units of large enterprises. In the study the innovation environment is proposed to be developed by increasing the mutual acknowledgement and co-operation of the actors, supporting the commercialization of ideas also after the launching phase of the enterprise, increasing the contacts of SMEs to the units of large enterprises, inspiring entrepreneurship and innovation activities. (Hyvärinen 2005, 42-46)

For SMEs' business point of view new business development seems to be only productive and promising way to cope with challenges. Small business is regarded as the engine room for innovation in many developed economies. Basically, the purpose of innovation strategy in small companies is the same as in large companies: to create firm-specific innovative advantage. The extreme diversity of innovation process at both industry and small firm level suggests that a wider range of models, approaches and methodologies should be employed. (Miettinen & Hine 2001, 195)

The management of product or service development is a very challenging decision making area. The Development of new products must fulfill both customers' needs and company's objectives. Companies have to assess carefully customer needs for the successful development of new products and services. Developing the right product or service requires an accurate understanding of customer needs. All available customer need information should be carefully assessed and utilized already in the early development phases. (Cooper 1993)

Companies have realized they have to live with change, and hence to plan for it. Organizational change could be affected in incremental steps or could shift away from current paradigm to varying degrees. Ideas for change apply to different aspects of the firm – its structure, strategies, products, processes etc. According to Nagasundaram & Bostrom (1995, 110-111) whatever the nature of change desired, the targeted deployment of idea-generation techniques is needed by organizations to generate and implement ideas and issues that will help them survive and remain competitive in the long run in a rapidly changing world. Group support systems are one way to enhance organizational creativity.

Group support systems in general

Group (decision) support systems have been studied since the middle of the 1980s in variety of contexts. The early stage of the group support systems focused on the development of a comprehensive definition, architecture, and a multidimensional taxonomy of the group support systems. Later the research has concentrated more to real life organizations, which means more empirical research. (Torkkeli 2002, 2)

According to DeSanctis and Gallupe (1987), group decision support system is an interactive computer-based system that facilitates the solution of semi-structured or unstructured decision problems by several decision makers who work as a group. The goal of group support systems is to help a group in effectively cooperating and work together to achieve its goals. Technology and applied group methods support innovating and group decision making by eliminating communication barriers, offering the group different tools and managing the use of time as well as by handling meeting agenda systematically. (DeSanctis & Gallupe 1987) GSS meetings are basically different from conventional meetings in two visible ways; each participant has to use a computer and a facilitator helps the chairperson run the meeting (Weatherall & Nunamaker 1996). The components of GSS include hardware, software, people and procedures.

Group support systems are often categorized according to the time/location matrix using the distinction between same time (synchronous) and different times (asynchronous), and between same place (face-to-face) and different places (distributed). (DeSanctis & Gallupe

1985; Turban & Aronson 2001, 267). In a narrow sense, the term GSS or innovationroom is used to describe a network of computers in a face-to-face environment, such as a conference hall, and the software which enables a group to exchange written comments, ideas and votes. (Aiken et al. 1994)

Several benefits of group work have been recognized. Some of the benefits are that (Turban & Aronson 1998, 351; Elfvengren et al. 2002, 14)

- Groups are better than individuals at understanding problems
- People are accountable for decisions in which they participate
- Groups are better than individuals at catching errors
- A group has more knowledge than any one member and can combine that knowledge and also create new knowledge
- A group may lead to problem solving synergy
- Working in a group may stimulate the participants and the process
- Group members will have their egos embedded in the decisions and will, hence, be committed to the solution
- Risk propensity is balanced; groups moderate high-risk takers and encourage conservatives

Turban and Aronson (1998, 351) list disadvantages of a group work

- Social pressures of conformity that may result in “groupthink”
- Time-consuming, slow process
- Lack of coordination of the work done by the group and poor planning of meetings
- Inappropriate influence
- Tendency of group members to rely on others to do most of the work
- Incomplete task analysis
- Nonproductive time
- Tendency to repeat what was already said
- Large cost of making decisions
- Tendency of groups to make riskier decisions than they should
- Incomplete or inappropriate use of information
- Inappropriate representation in the group

When summarizing above mentioned aspects about group work advantages and disadvantages, some interesting characteristics of group support systems can be drawn. Turban and Aronson (1998, 354) summarize the advantages of the important features of the GSS in their studies. According to Turban and Aronson, process structuring keeps the group on track and helps to avoid costly diversions. Parallelism via multiple simultaneous electronic communications allows for many people to speak and comment at the same time. When working anonymously, the members’ ideas, comments and votes cannot be identified, and individual people can’t dominate the discussion. The GSS enables larger groups with more complete information, knowledge, and skills to participate in the same meeting.

Shortly, the benefits of group support systems in comparison to conventional meetings can be listed as below (Elfvengren et al. 2002, 15 (adapted from Weatherall & Nunamaker 1996)

- Shorter meetings: technology and group support system improves topic focusing and gives clear structure for the meeting. Parallel processing of input will make meeting more effective and shorter.

- More/better ideas: sharing of input increases the amount of ideas or comments. Systems make it possible to work anonymously which puts the focus on ideas rather than contributor and makes more open discussion possible.
- Better documentation: all records, ideas and comments are instantly accessible in electronic form.
- Greater commitment: the ability of individuals to participate to the decision making process increases the commitment of the group.
- Immediate actions

InnoStudio in Focus

The coordinator of InnoStudio is Kouvola Region Federation of Municipalities with its Expertise Centre. InnoStudio helps companies to find new and profitable business activities. InnoStudio is a combination of IT-technology, software and modes of action, which support the participants in the meeting to work effectively as a group. It is interactive system, which eliminates the disadvantages of a tradition meeting – standard roles, impossibility to work simultaneously, conflicts caused by differing personalities and interests. InnoStudio is a practical application of group support systems which were described earlier in general terms. (InnoStudio 2005)

In action, InnoStudio supports innovating, contemplating possible options and decision-making, which usually consists of the following operations

- Effective data collecting
- Processing data
- Analyzing, editing and outlining data
- Sustaining group decision-making
- Collecting and documenting the results

Software used in group decision support systems include tools for brainstorming, idea generation, idea categorizing, stakeholder identification, topic commenter, alternative analysis, rank order voting, enterprise analysis and a negotiation support system. Idea generation is achieved by allowing participants to generate ideas simultaneously and share them via electronic brainstorming. There are many commercial system solutions for group support, which offer different capabilities. One of the main software that can help in the whole group decision process is GroupSystems. GroupSystems has been developed at the University of Arizona and Ventana Corporation. GroupSystems can support all phases in the decision making process from problem definition to final conclusion. The Software consists of tools or steps described earlier and session leader works as a facilitator by selecting the tools and group processes that will be most appropriate for the planned group session. (Torkkeli 2002, 6)

InnoStudio utilizes GroupSystems II as a main software to work in groups. GroupSystems' software solutions get group through important processes such as brainstorming, strategic planning, focus groups, requirements gathering or idea management. In figure 1 is described the basic innovating process. In each stage any tools required may be adapted to achieve the set goals.

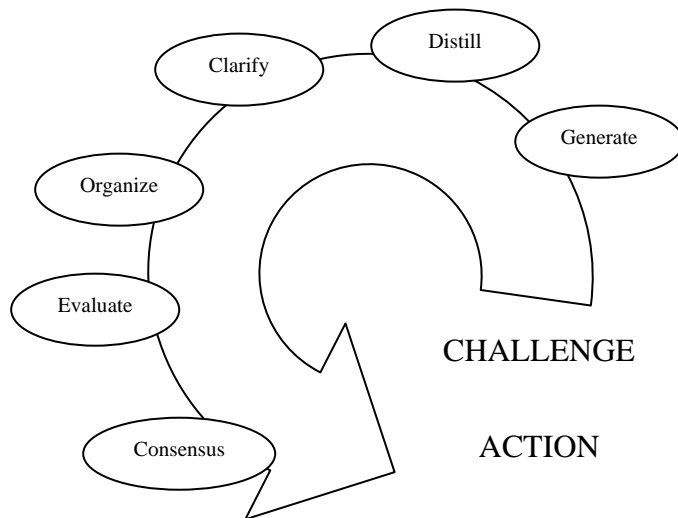


Figure 1. From challenge to action (GroupSystems 2005)

InnoStudio’s methods of operation contains a variety of services and processes, such as support for strategic planning, customer need assessment, new product or service development and company’s performance analysis. These different aspects are shown in figure 2. However, InnoStudio operates as a base for consulting firms to start new services of their own.

InnoStudio’s own services include

- Planning the meeting and setting the goals beforehand in the customer’s company
- Possibility to use the meeting room on a meeting day
- Utilizing the selected processes and tools to achieve the goals
- Orchestrating the meeting and controlling the equipment throughout the meeting
- Documenting the results and handing them over to the customer

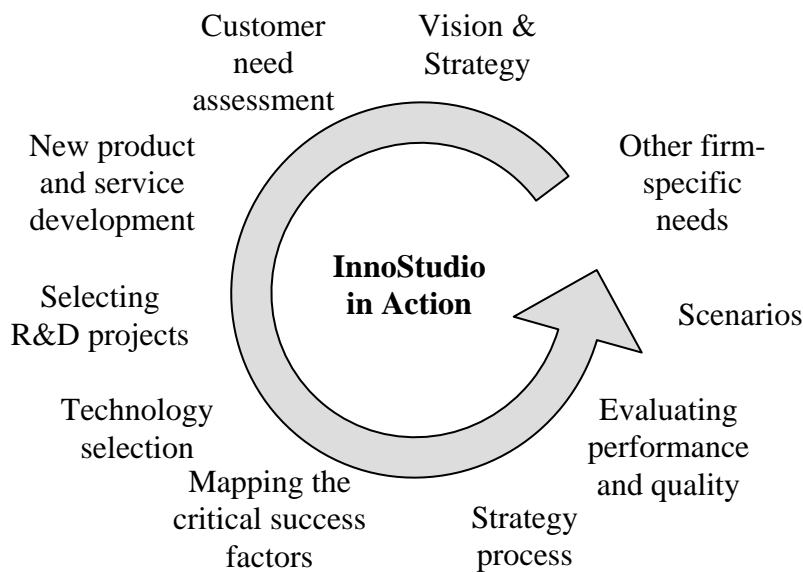


Figure 2. In InnoStudio following areas related to business activities are covered (InnoStudio 2005)

An Example of InnoStudio and group support system usage is described next. As mentioned earlier, there are many ways and situations in which InnoStudio and group support systems can be used to support idea generation, idea categorizing and decision making.

In figure 3 is a basic process applied for small and medium-sized companies to clarify their objectives to innovate new business possibilities or develop existing ones further. The whole process begins basically by planning the meeting and its goals beforehand in company. One of the basic notions behind the goal-setting is that a problem should be explicitly decomposed or broken down into a series of subproblems. Solutions are then obtained for each subproblem using in each stage tools required to achieve the set goals, and these solutions combined. (Armstrong et al. 1975, 257) It has been theorized that most tasks have a hierarchical or tree-like structure, enabling them to be divided and considered as a set of individual subtasks (Dennis et al. 1999, 95-96).

In meeting itself the phase of exploration of ideas starts the session. Idea generation tools are used for brainstorming ideas, which involves the development and exploration of issues relevant to task. Idea categorizing tool is used for synthesizing, structuring, and organizing ideas into specific groups or alternatives. Usually this is a follow up from brainstorming-phase. According for example to the creative process studies by Nagasundaram & Bostrom (1995, 87-90) the use of group support system in idea generation significantly increases the number of ideas generated.

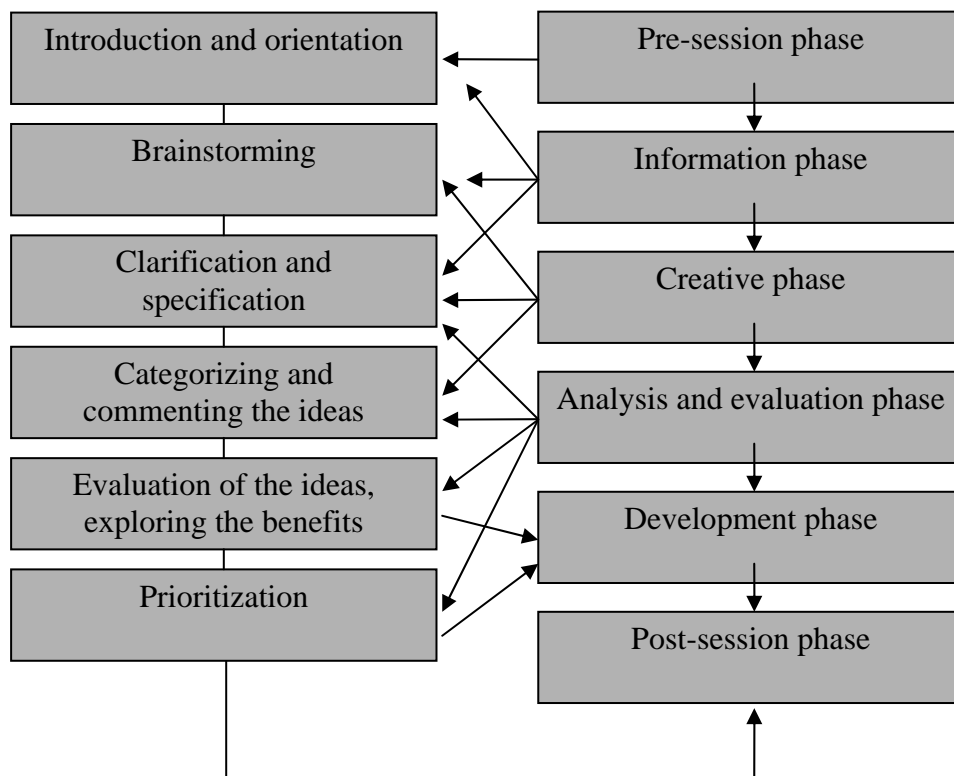


Figure 3. A process for innovating in SMEs

Commenting the ideas gives individuals possibility to clarify their or other ideas and the meaning or importance every idea presented. Finally, prioritizing tool is used to support the

individual group-members in evaluating alternatives. The figure 3 shows the interaction between different phases from challenge analysing into the decision-making, and how they interact with stages or steps in group support system process. In its simplicity the process boosts traditional phase-model analysis and decision making by increasing iterations between different phases.

The post-session survey is used to obtain feedback from the participants in the InnoStudio-sessions. The main questions for participants are

- How well did the session live up to your expectations?
- How well were the objectives of the session achieved?
- Were the session results worth the effort spent?
- Evaluate the effectiveness of the GSS-process
- How well did the process help in effectively focusing the discussion on essential matters?
- How functional was the brainstorming phase of the meeting:
- How functional was the commenting phase of the meeting?
- How functional was the prioritization phase of the meeting?
- Did you find benefits in the utilization of GSS that no other meeting methods would have been able to offer?
- How could we make the session more efficient? What could we do better in the session?
- Would the results have been achieved without the help GSS?
- Would you utilize the GSS again in similar types of situations?
- Would you recommend the GSS for others?

In addition results and participants experiences are evaluated with a set of propositions with a five-point rating scale.

Conclusions

In this report we have described existing challenges in innovation management and business development particularly in small and medium-sized companies. We have shortly reviewed the earlier research of group support systems and some demonstrable findings and benefits of group support systems. Our focus in future research will be on SMEs – which are the benefits and restrictions applying group support systems to develop business activities and increase innovativeness in small companies.

InnoStudio aids a group to cooperate and work effectively together to reach its goals. It supports group's decision making by eliminating the barriers of communication, by offering different tools for the group and by leading the use of time and handling the items systematically. Group support systems supported creative teamwork was found to be very important in the idea generation phase to generate, develop and evaluate new ideas concerning firm's strategy formulation, new business development process, and customer need assessment. The GSS supported creativity by increasing the number of ideas contributed, as well as quality of ideas. However, the findings and experiences are based on researchers' observations during meetings.

In this report we have not analyzed the experiences of SMEs about group support systems in detail. Participant feedback collected by electronic survey in the end of each meeting helps the researchers to measure the participants' commitment to the output of the meeting in future research. The survey can also be utilized to improve the developed services and processes for small and medium-sized companies. So far it is too early to make extreme conclusion or assess whether SMEs will benefit GSS permanently or not, but experiences so far support the conclusions which have found in research with larger enterprises and industries. It will be possible to study the effectiveness and profitability of InnoStudio-concept at a later point of time. These will be the further studies on topic.

References

- Aiken, M., Hawley, W. & Zhang, W. 1994. Increasing Meeting Efficiency with a GDSS. *Industrial Management & Data Systems*. Vol. 94, 13-16
- Armstrong, J., Denniston, W. & Gordon M. The Use of the Decomposition Principle in Making Judgements. *Organizational Behaviour and Human Performance*. Vol. 14, 257-263
- Cooper, R. 1993. *Winning at New Products*. 2nd ed. Addison-Wesley
- Dennis, A., Aronson, J., Heninger, W. & Walker, E. 1999. Structuring Time and Task in Electronic Brainstorming. *MIS Quarterly*. Vol. 23. No. 1, 95-108
- DeSanctis, G. & Gallupe B. 1985. Group Decision Support Systems: A New Frontier. *Database*. No. Winter, 3-10
- DeSanctis, G. & Gallupe B. 1987. A Foundation for the Study of Group Decision Systems. *Management Science*. Vol. 33, 589-609
- Elfvengren, K., Kärkkäinen, H., Torkkeli, M. & Tuominen, M. 2002. Group Decision Support Systems in the Customer Need Assessment of a Telecommunications Company. *Research Report 132*. Lappeenranta University of Technology
- Freeman, C. & Soete, L. 1997. *The Economics of Industrial Innovation*. 3rd ed. Pinter, London
- GroupSystems. 2005. <<http://www.groupsystems.com/page.php>>, 15.11.2005
- Hyvärinen, L. 2005. Innovation Environment of Enterprises in South East Finland and its development needs. *Employment and Economic Development Centre in South East Finland*
- InnoStudio. 2005. InnoStudio. <<http://www.innostudio.fi/>> 15.11.2005
- Miettinen, A. & Hine, D. 2001. If a Tree Falls in the Forest...: Informal Innovation in Small Firms. *Proceedings of ISPIM 2001*. Lappeenranta University of Technology, 195-208
- Nagasundaram, M. & Bostrom R. 1995. The Structuring of Creative Process using GSS: A Framework for Research. *Journal of Management Information Systems*. Vol. 11, Iss. 3, 87-114
- OECD. 1992. Report on Fiscal Measures to Promote R&D and Innovation. *OECD/GD(96)165*
- OECD. 1995. Report on Patents and Innovation in the International Context. *OECD/GD(97)210*
- Torkkeli, M. 2002. Technology Selection and Group Decision Support Systems: Case Studies on Supporting Strategic Technology Selection Processes. *Acta Universitatis Lappeenrantaensis 132*. Diss. Lappeenranta University of Technology
- Turban, E. & Aronson, J. 1998. *Decision Support Systems and Intelligent Systems*. 5th Ed. A Simon & Schuster Company
- Turban, E. & Aronson, J. 2001. *Decision Support Systems and Intelligent Systems*. 6th Ed. Prentice-Hall
- Weatherall, A. & Nunamaker, J. 1996. *Introduction to Electronic Meetings*. Technicalgraphics. Chichester