Launching Innovation in the Market Requires Competences in Dissemination and Exploitation

Kerstin Siakas[1], Richard Messnarz[2], Elli Georgiadou[3], Marja Naaranoja[4]

[1] *Alexander Technological Educational Institution of Thessaloniki, Department of Informatics, P.O. Box, 141, GR-57400 Thessaloniki, Greece {siaka}@it.teithe.gr*

[2] *International Software Consulting Network Ltd Florence House, 1 Florence Villas, Bray, Co. Wicklow 1E02, Ireland {rmess}@iscn.com*

[3] *Middlesex University, School of Engineering and Information Sciences, The Borroughs, London NW4 4BT, UK {e.georgiadou}@mdx.uk*

[4] *Unívers̀ity of Vaasa, Department of Industrial Management P.O.Box 700, FIN-65101 VAASA , Finland {marja.naaranoja}@uwasa.fi*

Abstract. It is widely recognised that innovation is required for economic growth on a number of levels, such as in Small and Medium sized Enterprises (SMEs), large organisations, regions and nations. Innovation is an important driver for organisational survival, sustainability, improvement, long-term productivity and economic growth. However, innovation in isolation is not only wasteful but also not useful. All projects, and in particular innovation projects, need to disseminate and exploit their results for maximising achievements and increasing sustainability after their completion. This includes launching of the innovation to market, transfer of results and best practices to different and broader contexts; potential tailoring to the needs of others; continuation after the funding period has finished; influences on policy and practice; as well as serving the public good. The emphasis should be on optimising the value of the project and on boosting its impact.

Many European and other projects seem to be missing a good valorisation strategy. Projects seem to be carried out in isolation, and finish without essential impact. In addition there is a lack of skills for carrying out valorisation actions. Taking this into consideration a new certified Valorisation Expert profession was created and sponsored by the European Commission aiming to fill the gap and to train various stakeholders in launching innovative and other project results in the market. In this paper we describe the aims and the objectives of the project and the competences base the project is aiming to create through its content and teaching approach.

Keywords: Innovation Networking, Stakeholder Networking, Dissemination Strategies

1 Introduction

Recent trends in the world economy including globalisation of markets and technology supply, networking as business models and technologies enabling distance mode of working have increased the complexity and competition level of organisations. There is a push for organisations to produce innovative products and services for survival, sustainability and growth. Simultaneously processes need to be innovative to keep costs down and to improve productivity. Innovation is about finding new ways of doing things and of obtaining strategic advantage.

The degree of novelty in products or services (unique offering), and/or in process (faster, lower cost, customisation) is decisive for the strategic advantage of innovation. Complexity (offering something that others find difficult to master), legal protection of intellectual property rights (others need to pay licence), timing (first-mover or fast follower advantage), robust design (platforms others can build on), rewriting the rules (different ways of doing things – old ones redundant) and reconfiguring the parts (rethinking how bits of systems work together) can also be considered innovations providing strategic advantage [16]. It is not always the innovation or the technology in itself that matters, but innovation-in-use (e.g. growth of email use). In [3] they argue that innovation is an invention implemented and taken to market.

Beyond innovation there lies disruptive innovation that changes social practices by changing consumer behaviour and/or causing disruption in the way business is done. In [4] they show, by using lessons learned of successes and failures of leading companies, how disruption innovations can initially be rejected by mainstream customers because they are not ready to use the new product or service. As a result firms with strong customer focus may allow important innovations to languish, because they did not concentrate on new customers for the products or the services of the future. The more innovation develops over time, the more players are brought into the game [17]. A complex exchange network emerges of individuals and interest groups (customers, partnerships, joint ventures, company acquisitions, sponsors etc.) engaging in various transactions necessary for moving the innovation forward and to launch it on the market.

Many innovative projects, however, seem to be missing an innovative business model and a good valorisation strategy. The French term valorisation is often used encompassing all activities that maximise the achievements of a project, including dissemination and exploitation of results and outputs.

The word dissemination derives from Latin 'disseminare' ('*dis'* means to spread or scatter widely and *'semen'* means seed[1]) and indicate spreading of information to ensure that others benefit from experiences gained in the project. Exploitation of the results of project activities means that more people can share in the successes, experiences and lessons learned.

The European Commission defines dissemination as "a planned process of providing information on the quality, relevance and effectiveness of the results of programmes and initiatives to key actors. It occurs as and when the results of programmes and initiatives become available and exploitation as *"mainstreaming: the*

[1] http://www.thefreedictionary.com

planned process of transferring the successful results of programmes and initiatives to appropriate decision-makers in regulated local, regional, national or European systems, and multiplication: the planned process of convincing individual end-users to adopt and/or apply the results of programmes and initiatives"[2].

2 Innovating Innovation in Europe

In EuroSPI (European Systems and Software Process Improvement and Innovation) European industry and task forces for innovation published various case studies about success criteria in European industry.

A most recent set of publications [11], [12], [13] illustrates that the European industry has transformed into a networked cluster of partnerships and stakeholders who jointly integrate larger products in e.g. Automotive, Aerospace, and medical industry. Strategies were developed by leading industry to create idea and stakeholder networks and infrastructures to build a networked ground for idea creation, innovation evaluation and exploitation of ideas (see Figure 1).

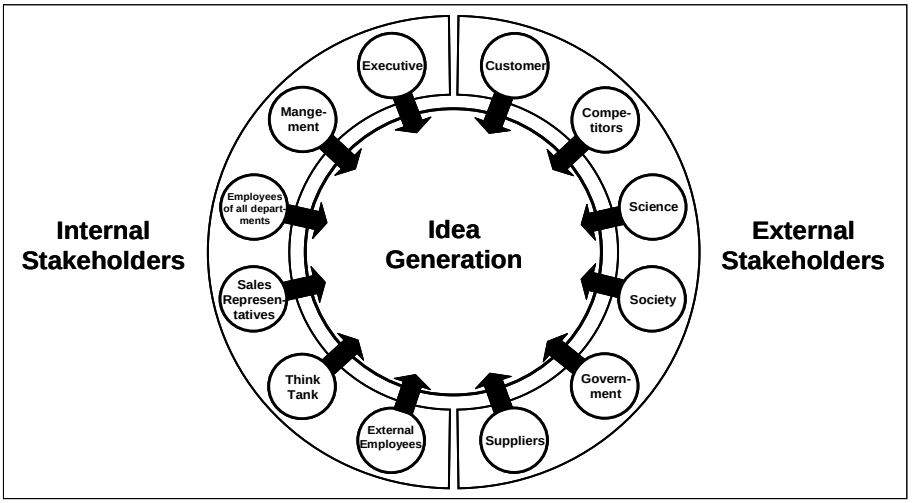

Fig. 1. Making Idea Generation a Professional Process Linked with Lead Industry [20]

In addition to that KSPG (a leading Automotive company owned by Germany's largest steel industry) published that companies nowadays need a professional infrastructure to support this level of networking but also to integrate ideas in a database and to evaluate with the help of supervision teams and transporting them into real products.

---

[2] http://ec.europa.eu/education/programmes/llp/guide/valor/what_en.html#2

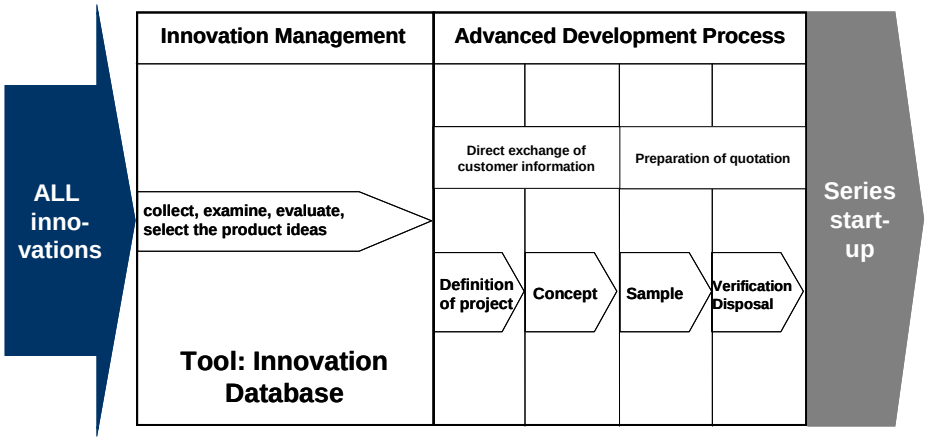

Fig. 2. Supporting Idea Generation and Innovation with Professional [12]

In [10] the transformation of the innovation networking in a European dimension is described and it is highlighted that currently virtual expert topic clusters are built which are connected to such stakeholder networks to deliver solutions for leading industry in Europe. This type of dynamic networking is then seen as a driver for European innovation success in the future.

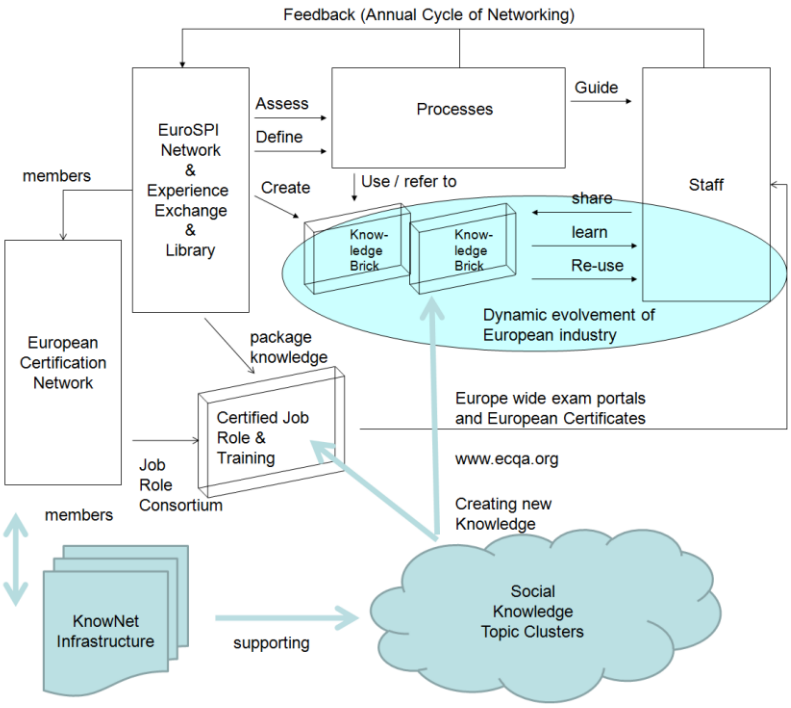

Fig. 3. EuroSPI Strategy 2020 - Expert Clusters as Knowledge Clusters to be Networked to Industry and Qualification Strategies [10]

The EuroSPI 2020 objectives published in [10] foresee that the networking and knowledge exchange has to be enriched by service based networking functions (shown in Figure 3), including:

1. Packaging knowledge into service packages and training with certificates. For this a European Certification and Qualification Association (ecqa.org) was set up supported by a series of EU projects from 2005 – 2012.
2. Creating groups of experts who form a knowledge community which can solve problems and give advice to industry. This resulted in e.g. workshop communities around EuroSPI and in e.g. Germany the Bavarian industry kick off financed in 2003 a set of cross – company task forces in areas required to keep leadership on the market.
3. Building on social media based knowledge communities and software which can create a knowledge based for innovation networking across regions and companies.

If innovations are successful this usually leads to the hype cycle which was published by Gartner group and is continuously discussed in various articles [1],[10].

The "1. Technology Trigger" phase in the hype cycle includes building a critical mass of interest which leads to a growing investment into the innovation as a successful start up.

Also the SPI Manifesto [14] which describes 3 key values and 10 success principles for industry implementing improvement and innovation contains organisational success principles which directly support the dissemination and distribution of improvement ideas, human aspects and networked learning and growth.

In addition, the EU project ORGANIC (Certified Innovation Manager, 2003 – 2005, [8]) developed competencies for dynamic learning and networking to build on continuous innovation and growth.

Conclusion Concerning European Industry:

This means that innovations in Europe must get linked into these stakeholder networks, expert clusters, and organisational strategies of leading industry to get their ideas accepted, exploited and used in a broad sense. A good valorisation strategy must find ways to disseminate and network into the industry. And researchers can expect that leading industry has created such networks. It is necessary to find a way to get connected.

3 Innovation Success Factors in General

Innovative organisations usually do extremely well in their core mission, but they often fail to capitalise on their own learning [5]. They use passive approaches relying on the assumption that evidence-based practice is enough to spread innovations and best practice into broad use across organisations and among organisations and the market in terms of consumers and competitors. Dissemination, however, is not just to inform potential stakeholders about innovations and best practice but to embed these

in the organisational culture, including structures, processes, underlying behaviours etc.. The critical initial criterion for dissemination comprises an innovation or practice that is worthy of replication and spread. This is equivalent to a CMMI maturity level of 2 (managed). It can be said that at this level the organisation focuses on projects and is reactive rather than pro-active. Organisational conditions need to be supportive of inventive activity, originality of thought, creativity and breakthrough insights. It is generally recognised that creativity generates the basis of innovation [2]. The likelihood for innovative work attuned and responsive to the market in terms of consumers and competitors is only made possible by social conditions inside organisations that can affect psychological conditions likely to lead to creative work. The creation of an innovative culture involves a learning process that builds on evaluation, reflection and development of the organisation toward response maturity for emerging challenges. The relationship between social attribution and technological possibilities are cornerstones for the learning process. An emergent challenge is tapping collective explicit and tacit knowledge and intelligence of users (customers and consumers) by social media networks and thus reaching beyond the conventional boundaries of the organisation. Users' tacit knowledge can for example be tapped through reflection in practice by launching prototypes for user tests before the product is launched on the market. Another key factor in tapping collective knowledge is the leverage if disparate assets of people from different cultures, different disciplines and different organisations. Today the Information and Communication Technologies (ICTs) provide opportunities, such as social media, to connect people together in a totally different fashion than before and also to shape artificial intelligence prototypes that can evoke tacit opinions by customers.

In [16] they propose that key factors for competitive success include organisation specific knowledge and capacity to exploit this knowledge. Other success-factors are related to the accumulation of the firm specific knowledge, level of uncertainty regarding present and future technology developments, competitive threats and market demands. In addition they argue that internal structures and processes must continuously balance conflicting requirements to identify, develop and exploit specialised knowledge across technological fields, business functions and product divisions. Ideas flowing out of the organisation for evaluation and flowing into the organisation as new offerings and new business models is called Open Innovation [3]. Finding the right balance and mechanism for this situation seems to be a core issue.

In [6] they discuss the concept of C-space (Culture Space) by analysing the flow of knowledge within and among organisations. The framework consists of two dimensions, the codification, that expresses the extent to which information can be expressed and the diffusion, the extent to which information is shared by a given population. The interaction between codification and diffusion result in the social learning curve in culture space depicted in Figure 4.

The social learning curve consists of four stages: problem solving, diffusion, absorption and scanning. The problem-solving process results in higher levels of codified information (ease of expression), which in turn increases the diffusion level and the absorption of the information by external stakeholders. The scanner stage is the feedback loop that contributes to learning and thus to the social learning curve.

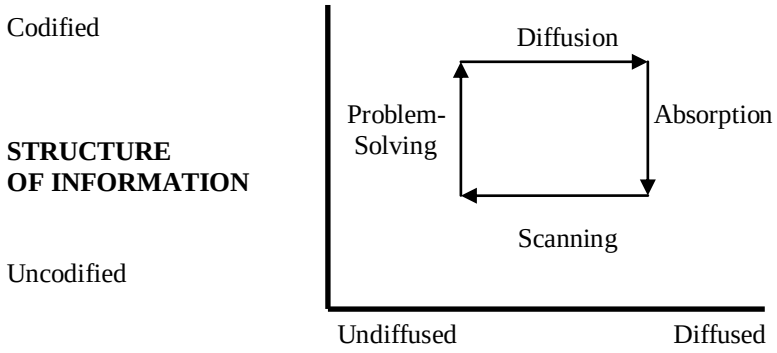

Fig. 4. The social learning curve in culture space

In [8] the authors discuss dissemination of innovation in community psychology by looking at the Development of Innovation (DOI) paradigm related to the improvement of human and community functioning. They conclude that the DOI typically involves the dissemination of particular social programs that consists of three components, namely adoption, implementation and institutionalisation. They also argue that DOI, as a paradigm, offers a valuable framework to community psychologists for social change, including developmental perspectives on innovation, properties of innovations and innovators, implementation and post-adoption activity, measuring implementation, fidelity vs. adaptation and reinvention, as well as dissemination of interventions and innovations into routine practice.

3 Diffusion of Innovation

Using a staged model of behaviour change, untying is seen as a precursor for dissemination activities, which in turn exposes one to consider change in their practices e.g. use the research results. Implementation activities capitalise on this by "enabling" and subsequently "reinforcing" the desired behaviour change. Different skills are needed for each activity.

Rogers [15] defines the innovation-decision process as the "process through which an individual (or other decision making unit such as a group, society, economy, or country) passes through the innovation-decision process". According to Rogers there are five stages in the innovation-decision process:

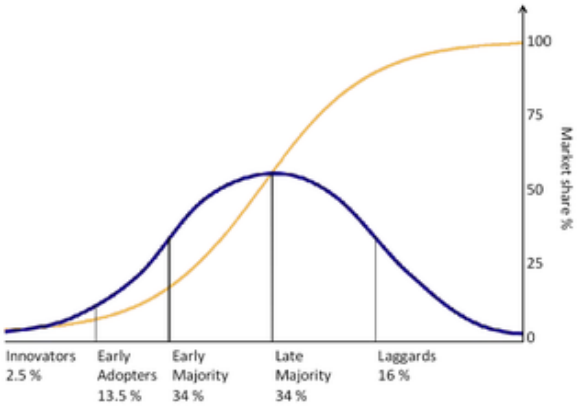

Figure 5. With successive groups of consumers adopting the new technology (shown in blue), its market share (yellow) will eventually reach the saturation level. In mathematics the S curve is known as the logistic function (Rogers 1962, Fisher et al 1997)

(1) from first knowledge of innovation,
(2) to forming an attitude toward the innovation,
(3) to a decision to adopt or reject,
(4) to implementation of the new idea,
(5) to confirmation of this decision.

The previous practice, felt needs/problems, innovativeness, and norms of the social systems affect the innovation decision process. The first stage of the innovation-decision process entails seeking one or more of three types of knowledge about the innovation. Rogers [15] describes these as:

1. Awareness knowledge is information that an innovation exists.
2. How-to-knowledge consists of the information necessary to use an innovation properly, and
3. Principles knowledge consists of information dealing with the functioning principles underlying how the innovation works.

Rogers states that awareness and knowledge of an innovation can be made most efficiently through mass media. It will be interesting in twenty years or so, to ascertain if mass media will still be considered the most efficient means to create product awareness and knowledge.

According to Rogers [15] the diffusion of innovations depends on the type of adopter. Rogers defines an adopter category as a classification of individuals within a social system on the basis of innovativeness. Rogers suggests five categories of adopters in order to standardize the usage of adopter categories in diffusion research. The adoption of an innovation follows an S curve (Fig.3) when plotted over a length of time [7]. The categories of adopters are: innovators, early adopters, early majority, late majority, and laggards [15]. Each of these categories need a different approach when disseminating the innovation.

4 Building on the Valorisation Competences

In order to support organisations in building competences in dissemination and exploitation of results of innovations, research projects and lifelong learning projects a new valorisation competence is currently developed within the frame of the

European Certification and Qualification Association[3]. The *ECQA Valorisation Expert Training and Certification*" (VALO) two year project started in October 2011 with funding from the EU Lifelong Learning Programme. The project aims at developing a new skill set and a job role qualification study program, where competencies in valorisation are customised for the European industry into an online study program complemented with an on-line examination and certification training and certification schema for Valorisation experts. A pilot training will take place in the participating organisations/member states (Austria, Finland, Greece, Ireland and the UK) and the study programme will be refined and improved based on systematic feedback. Table 1 provides the skills developed during the training. The training material is modular, consisting of Units (U) and Elements (E). Every element consists of 3-6 performance criteria in line with the European Qualification Framework (EQF)[4].

5. Pedagogic Framework and Quality Assurance

The production of the training material follows the European Learning Outcomes framework embodied in the Bologna Process whereby expectations at the end of the study are expressed as knowledge and understanding but also kills i.e. what the learner will be able to do The training material available in the learning portal is supported by exercises. The accredited training can either be provided in traditional or distance mode. The same structure for trainings, self test, exam and certificate ensure a common Europe wide integrated Infrastructure and training base. The ECQA Exams are computer-based and random. Exams are generated from a large central question pool translated to several European languages (depending on countries participating at each profession schema).

Table. 1. The Skill Card of the ECQA Valorisation Competences

U1	**Understanding the importance concerning valorisation of innovation and EU project results**
U1E1	Introduction to valorisation (terms such as: broad and deep dissemination – exploitation: sustainability, value creation and mainstreaming)
U1E2	Innovation
U2	**Dissemination**
U2E1	Broad Dissemination
U2E2	Deep Dissemination
U2E3	Dissemination Strategy
U3	**Exploitation**
U3E1	Creating Stakeholder Value

[3] www.ecqa.org
[4] http://ec.europa.eu/eqf/home_en.htm

U3E2	Sustainability
U3E3	Mainstreaming
U3E4	Exploitation strategy
U4	**Valorisation Methods**
U4E1	Diffusion
U4E2	Communication to potential stakeholders
U4E3	Valorisation channels - formal and informal valorisation
U4E4	Valorisation tools (cluster building, open innovation etc.)
U4E5	Intellectual Property Rights (IPR)

One of the objectives of the Bologna Process is the establishment of quality assurance systems enabling the evaluation of programmes and institutions in the form of internal assessment together with external reviews [18]. It is aimed that all stakeholders (member states, institutions, staff, students, industry) participate in the process and that results are transparent so that good practice and lessons learned can be shared [19]. For this reason the development of the materials will undergo systematic reviews and updates by specialists drawn from members of the consortium. Because the learner will engage in self directed study and self assessment it is important to anticipate as many learner questions as possible. The exercises, scenarios and model answers will provide knowledge, guidance, feedback and encouragement to the learner.

As the number of people who are taking the Valorisation Manager Certification grows (wider acceptance) the database of exercise and exam questions will grow. In order to make the system sustainable comprehensive and systematic updating, maintenance and quality assurance of the database are incorporated enabling wider dissemination, and providing a self-funding system. The ultimate measure of success will be the widespread dissemination and the sustainability of the project outcomes. The benefit will satisfy the requirements of all stakeholders starting from the individuals (teachers and learners), the participating organisations and the funding bodies. Valorisation of the results will feed back to the reviewing process of new research and development proposals to avoid duplication of effort and re-inventing the wheel.

4 Conclusions

All projects (innovations, research projects and LLPs) need to valorise (disseminate and exploit) their results for maximising achievements and increasing sustainability after their lifetime. This includes transfer of results and best practices to different and broader contexts. Many European and other projects seem to be missing a good valorisation strategy. Projects seem to be carried out in isolation, and finish without essential impact. In addition, there is a lack of skills for carrying out valorisation actions. The aim and objective of this work is to fill the gap and create a new certified Valorisation Expert profession adding to the 18 existing certifications in the European Certification and Qualification Associations. The skill card of the new profession was

described. Before the development of the actual training material feedback is sought from the industry and other stakeholders in order to develop competences valuable to the market.

European industries have already started to develop and implement open innovation strategies by building up cross company task forces, networks of stakeholders, idea databases, innovation supervision teams, etc. [9],[10],[11],[12][13]. The dissemination and exploitation of new ideas in future requires to get connected to these networks and get dynamically involved. This will require considerable dissemination, valorisation and especially networking competences.

Acknowledgements

The work presented in this paper has been partially supported by the activities in the project "*ECQA Valorisation Expert Training and Certification*" (VALO), number 2011-1-GR1-LEO05-06789, funded by the EC LLP under the Leonardo da Vinci programme with support from the European Commission. This publication reflects only the views of the authors, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.

References

1. Miklós Biró (2009): *The Software Process Improvement Hype Cycle. Invited contribution to the Monograph: Experiences and Advances in Software Quality* (Guest editors: D.Dalcher, L. Fernández-Sanz) CEPIS UPGRADE Vol. X (5) pp. 14-20.
2. Bullinger, H.J. (1999). Turbulent times require creative thinking: new European concepts in production management, *International. Journal Production Economics*, No. 60-81, pp. 9-27
3. Chesbrough, H. (2003). *Open Innovation, The New Imperative for Creating and Profiting from Technology*, Harvard Business School Press, Boston, USA
4. Christensen, C.M. (1997). *The innovator's dilemma: when technologies cause great firms to fail*, Harvard Business School Press, Boston Massachusetts, USA
5. Dearing, J.W. (2008). Dissemination of Innovation: the Will to Change an Organisation, *the Permanente Journal*, Summer 2008, Vol. 12 No. 3, pp. 75-77
6. Griffiths, D., Boisot, M. (2000). Are there any competences out there? Identifying and using technical competences, in J. Tidd (ed.), From Knowledge Management to Strategic Competence, Imperial College Press, Londoln, UK, pp. 199-229
7. Fisher, J. C., Pry R. H. (1971). A Simple Substitution Model of Technological Change, *Technological Forecasting & Social Change*, vol. 3 No. 1
8. Mayer, J.P.; Davidson, W.S. II, (2000). Dissemination of innovation as social change of community psychology in Julian Rappaport and Edward Seidman (Eds), *Handbook of community psychology*, pp. 421-443. Dordrecht, Netherlands: Kluwer Academic Publishers, xxi, 1011
9. Messnarz R. et al., (2004). ORGANIC - Continuous Organisational Learning in Innovation and Companies, in: Proceedings of the E2005 Conference, E-Work and E-commerce, Novel solutions for a global networked economy, eds. Brian Stanford

Smith, Enrica Chiozza, IOS Press, Amsterdam, Berlin, Oxford, Tokyo, Washington, 2004

10. Messnarz, R., M. Biro, S. Koinig, M. Reiner, R. Vajde-Horvat, D. Ekert, *The future of SPI Knowledge and Networking in Europe – A Vision*, In: O'Connor, R., Pries-Heje, J., Messnarz, R. (Eds.): Systems, Software and Services Process Improvement – 18th European Conference, EuroSPI 2011, Roskilde, Denmark, June 27-29, 2011, CCIS 172, Proceedings, pp. 121-132, Springer-Verlag, Berlin Heidelberg (2011)
11. Neumann, M., Riel, A., Brissaud, D.: *Improvement of Innovation Management through the Enlargement of Idea Sources.* In: O'Connor, R., Pries-Heje, J., Messnarz, R. (Eds.): Systems, Software and Services Process Improvement – 18th European Conference, EuroSPI 2011, Roskilde, Denmark, June 27-29, 2011, CCIS 172, Proceedings, pp. 121-132, Springer-Verlag, Berlin Heidelberg (2011)
12. Neumann, M., Riel, A., Brissaud, D.: *Innovation Management System for the Automotive Supplier Industry to Drive Idea Generation and Product Innovation.* In: Proceedings of the 17th EuroSPI Conference, Vol. 17, pp. 7.13-7.24 (2010)
13. Neumann, M., Riel, A., Brissaud, D.: *Improvement of Idea Generation by Capitalisation on Internal and External Stakeholders.* In: Industrial Proceedings of the 18th EuroSPI Conference, Vol. 18, pp. 3.25-3.33 (2011)
14. Pries-Heje, J., Johansen J. (2010): SPI Manifesto. Version A.1.2.2010. Available at: http://www.iscn.com/Images/SPI_Manifesto_A.1.2.2010.pdf
15. Rogers, E. M. (1962). Diffusion of Innovations. The Free Press. New York
16. Tidd, J., Bessant, J., Pavitt, K. (2001). *Managing Innovation, Integrating technological, market and Organisational Change,* 2nd edition, John Wiley & Sons Ltd., West Sussex, UK
17. Van de Ven, A.H., Polley, D.E., Garud, R., Venkataraman, S. (2008), *The innovation journey*, Oxford University Press, New York, USA
18. Bologna. Retrieved April 22nd, 2012 http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html
19. Siakas K. & Georgiadou E. (2009) *A Flexible Adaptable Internal Quality Assurance Framework for Higher Education: Designing Key Performance Indicators*, Proceedings of International Conference (Tempus JEP-27178-2006) on Quality Enhancement: Experience, Challenges and Perspectives for Armenian Higher Education, October 5th and 6th, Yerevan, pp.190 – 203
20. M. Neumann, Presentation at the EuroSPI 2011 conference, Workshop about *"Creating Environments Supporting Innovation and Improvement",* http://2012.eurospi.net/images/Documents/eurpspi%20ws1%20neumann.pdf