ACTA TECHNICA CORVINIENSIS
– Bulletin of Engineering
Tome X [2017]
Fascicule 1 [January – March]
ISSN: 2067 – 3809

[1.]Dusko LUKAC, [2.]Maria Mikela CHATZIMICHAILIDOU

COMMON SENSE APPROACH AS A BASIS FOR SUCCESSFUL UNIVERSITY-INDUSTRY COOPERATION

[1.] Rheinsiche Fachhochschule Köln gGmbH, University of Applied Sciences, Cologne, GERMANY
[2.] University of Cambridge, Cambridge, UNITED KINGDOM

Abstract: Many studies confirm the positive aspects of the "open innovation" approach for university- industry collaborations. Often are such positive aspects connected with different, in studies proposed, step-by-step procedures of open innovation implementation, within the university- industry cooperation. Such procedures take into consideration cultural aspects of the parties, core capabilities, employees and staff, structures of organizations, issues regarding managing intellectual property, and at the end, creation of knowledge base, all in order to run university-industry cooperation successful. In this paper we show that a lot of collaborations develop themselves successful, not by following strictly methods proposed by literature, but by acting according to common sense code. We show, based on best-practice example of cooperation between the EPLAN Software & Services Company and Rheinische Fachhochschule Köln gGmbH, that some collaborations are open innovative in their practice, even if they do not follow the open innovation idea and that open innovation as an idea is not the primary reason for successful cooperation.
Keywords: Open Innovation, University-Industry Cooperation, Common Sense Code

INTRODUCTION

In different studies, is the open innovation idea priced to be a business success factor [1]. Many companies, as well as higher institution organizations, pursues a business to guarantee their good economic performance, they have to produce innovative products, or to offer innovative and novel knowledge, meet customer, students' and own needs, and respond rapidly to market burdens.

The idea of open innovation supports the notion that companies and educational institutions do not necessarily have all the competencies to perform every operation in-house, so that they search for partners, to share their "problem" and on the same way as before, to come to the wishfully results [2]. Along these lines, partnerships between two or more partners, should help in solving the set of difficulties, which may not be solved by the partners alone. Additionally, recent studies of open innovation have pointed to the rising significance of external sources of innovation, so that in the latest years, many enterprises have established partnerships, with so-called centers of knowledge like institutions of higher education [3]. It is also to be pointed out that most of the studies about open innovation mention the R&D activities in connection with the "open innovation" idea, but only few of them so-called formal and unformal collaborative projects. Objective of this paper is to indicate whether open innovation is a way for successful holistic designing of one university-industry cooperation, or such one successful cooperation can be based on ordinary personal experiences and heuristic methods that enable drawing intuitive insights or tacit knowledge from our experience by shaping the cooperation.

PRINCIPLES OF OPEN INNOVATION APPROACH

As stated by [12, p.40] "Innovation has been defined in a different manner". One commonly accepted definition of innovation is well-defined by [13, p.5], along with the innovation is "the adoption of an idea or behavior, whether a system, policy, program, device, process, product or service, that is new to the adopting organization".

Accordingly, innovation is "something new or improved, which is done by the enterprise to significantly add value…" [14, p.4]. Organizational innovation is widely described as the company's

capability to realize a variety of coordinated actions, in order to distribute new products or services to the market in a way that outclasses the market opponents.
In a narrower sense, innovation result only from ideas when these are implemented into new products, services or procedures, which really find successful use and penetrate the market (i.e. diffusion). In the innovation-related terminology, terms such as "open" and "closed" models are often used. The concept of closed innovation is a model where companies generate their individual innovative ideas and do their distinct R&D to update invention into innovation. The concept of the open in contrast to the closed innovation model, is described as the action of using "purposive inflows and outflows of knowledge to accelerate internal innovation…" [17, p.1]. The crucial differences between the two abovementioned models are visibly illustrated in Figure 1.

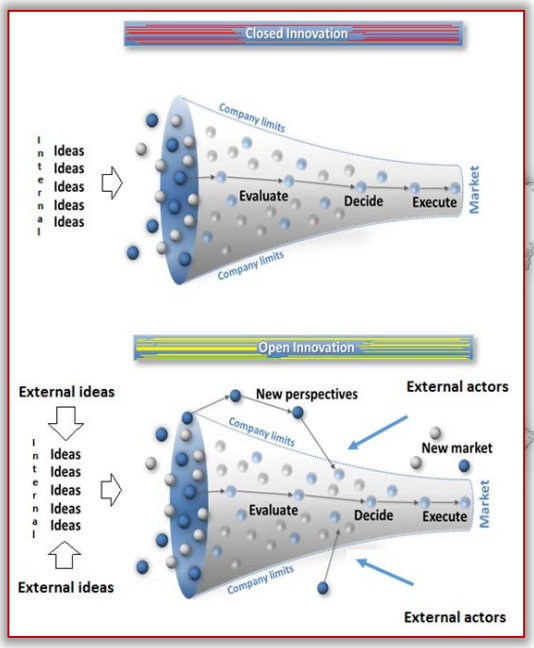

Figure 1 – Closed and Open Innovation Model, adopted by [18]

External actors in Figure 1 could be universities, companies, institutions or individuals. In the open innovation model, all actors can bring their own ideas and practical support into the joint project, in order to realize services or products, appropriate for the market. This means that R&D activities are not delimited by firm's boundaries. Furthermore, some of the features of the open innovation model, are that appreciated R&D activities may be exposed and established externally, the focus lies on building a better business model. On the other side, the issues of the intellectual property are not merely an internal matter, but it is arranged with external partners. The open innovation strategy that companies implement may vary, in relation to their size and determinations, as well as the type of openness of the innovation progress. According to [19], there are four types of openness and their associated benefits. According to [20], these types of openness can be shaped as a two-dimensional frame, consisting of the evaluation of the studies on open innovation. The two-dimensional framework encompasses the comparison between the so-called inbound (acquiring and sourcing) and outbound (selling and revealing) innovations versus pecuniary and non-pecuniary methods. Its intention is to evaluate the motives, by which some enterprises gain, and others may lose, with the application of the open innovation notion. The framework is presented in following figure.

Open Innovation Type	Description	Mechanisms
Outside-in (Inbound) ➢Pecuniary inbound [Acquiring] ➢Non-pecuniary inbound [Sourcing]	Involves opening up the company's own innovation processes to many kinds of external inputs and contributions	• In-licencing intellectual property • Scouting • Crowdsourcing • Intermediaries • Competitions and tournaments • Communities
Inside-out (Outbound) ➢Pecuniary outbound [Selling] ➢Non-pecuniary outbound [Revealing]	Involves allowing unused and under-utilized ideas and assets to go outside the organization for others to use in their businesses and business models	• Out-licencing intellectual property and technology • Donating intellectual property and technology • Spin-offs • Corporate venture capital • Corporate incubators
Coupled ➢Bi-directional ➢Interactive collaboration in form of joint production	Involves combining purposive inflows and outflows of knowledge to collaboratively develop and/or commercialize an innovative	• Strategic alliances • Joint ventures • Consortia • Networks • Ecosystems • Innovation platforms

Figure 2. Two-dimensional frame of open innovation in accordance with [20]

According to the authors, specific frames are in accordance with [12, p.42], defined as follows:

(1) Revealing: this type of openness relates to outbound, non-pecuniary innovation indicates how much the firms expose about their inside resources without direct monetary recompenses, taking into consideration, the not direct benefits for the firms.
(2) Selling: this type of openness relates to outbound, pecuniary innovation indicates, how the companies buy and sell their developments, and know-how by selling or licensing the assets developed in other organizations.
(3) Sourcing: this type of openness relates to inbound, non-pecuniary innovation indicates, how the companies can use external bases of innovation. The underlying principle is, that the more external sources of innovation are acquired, the more open is the companies' research policy.
(4) Acquiring: this type of openness relates to inbound, pecuniary innovation indicates, the achievement of participations for the innovation progress by the way of the market, that is, how companies license and gain know-how from third parties. Firms licensing or gaining know-how from third parties should have research ability and experience to review knowledges.

Connected to the grouping of the number of players involved in the process of innovation, there are, the so-called spots of concentration, where open innovation is positioned [21]. These spots can, according to the literature, be: internal R&D, internal cross-functional collaboration, mass collaboration and R&D alliances. The spots of concentration of the open innovation process are related to the locus of the innovation process and the number of the actors n>2.

UNIVERSITY-INDUSTRY ALLIANCES AND OPEN INNOVATION

In the case of universities and companies, both of them try to gain benefits out of cooperation. Scrutinizing both parties, it can be stated that enterprises have incomplete access to all essential competencies, services, apparatus, assets, etc.. On the other side, universities try to gain financial support for their work, to commercialize their academic research results and with it, their status within the academic society.

Therefore, there is an obvious benefit from the collaboration for both sides. There are studies proposing that organizations "embed the innovation process in their daily business and long-term strategy, in order to create new products and solutions because the innovation is also a key factor for organizations." [4, p.1].

In order to correctly use peripheral resources, according to the authors, the innovation process and partnership in the segment of the new product development becomes more open innovative. In [5, p.3078] it is mentioned that, "Looking further on the operational issues, universities may face some thoughtful complications related to alliance with industrial companies. The risk for universities doing fundamental research, if join to the project with industrial partner, can be the pressure they are exposed to, to concentrate themselves too much on applied research and with it to ignore the elementary research and fundamental education, because the project funding comes mostly from industrial companies.

Often, daily business requires much efforts so that supplementary working time is needed to do both, daily job and project job, so that the educational daily requirements cannot be met without extra work or extra working force." As stated in [6], restrictions to academic honesty, i.e. in the form of delays in publication or problems associated with "in secret" issues, may appear.

A further problem may well relate to the dependence on financial support. By accepting financial support, universities may commit themselves to enterprises which support them, and therefore lose their bargaining power. It can lead to divergences in proprietorship and use of academic properties [7]. Moreover universities have expectations, which have to be fulfilled. One of the main issues is the result of the partnership. That is, often, the results achieved may end up being fairly insignificant equaling with the efforts invested in co-operative open research, and guaranteed knowledge transfer my not happen [8],[9]. Further obstacles relate to organizational cultural issues, like unmotivated stuff, or different perceptions of time horizons, which may hinder such open innovative ideas [10], [11].

Despite the obstacles, collaborations are usual, often practiced by companies, universities and other partners. Some collaborations follow the open innovation idea, others are based on further principles, such as the so-called common sense code principle.

COMMON SENSE APPROACH TO UNIVERSITY-INDUSTRY COOPERATION

Some cooperation opportunities develop themselves gradually and become after a while a fruitful business idea. This gradual development can be based on no specific model, but on the common sense approach. This means that instead of implementing strict procedures, the cooperation is developed by mutual tendency to follow best-principles and practices of doing business and realization of the target objectives. Thanks to the collaboration between the Rheinische Fachhochschule Köln (RFH), University of Applied Sciences in Cologne/Germany and EPLAN Software and Services GmbH & Co.KG, a third party certification program carried out at RFH has been developed.

The main focus of the cooperation has been the so-called informal declaration of intend. In this informal meeting minutes, the targets and expected results have been defined. Those have been reached by the RFH, in expected time of 6 months and in expected quality. It was a natural step for the definition of the further collaboration steps. Gradually, further steps and collaboration targets have been defined. Those have been reached to the full satisfaction of both partners. In order to reach the targets, some open innovative methods and approaches, as well as further business approaches (differed by open innovation idea) have been implemented, without to highlight their affiliation to some business model or to explicitly relay on some suggestions of specific academic writings.

Moreover, according to common sense, the necessity to "open" some information has been jointly accepted, as well as the necessity for definition of joint research in addition to development of interfaces. Decisions, how far and under which circumstances, sharing of internal information and knowledge have to be carried out, was mostly result of meetings. Important subjects have been protocolled but not defined very strictly, without losing the sight of the target objectives and middle or long term goals. By this way external cross-functional

collaboration have been developed and kept functional for 8 years. The concept developed between both organizations is related to the, in-between, international model of certification of the E-CAD users of the software developed by EPLAN company. Certification itself, is carried out solely at RFH. In the following section one of the joint developed certification models is presented.

STUDENT CERIFICATION MODEL DEVELOPED BY RFH & EPLAN

As a result of this collaboration, three different certification programs have been developed: EPLAN Certified Engineer for industrial customers, EPLAN Certified Technician, as so-called Eplan Education model for attenders of technical colleges and vocational schools and EPLAN Certified Student, also as Eplan Education model, for visitors of universities and universities of applied sciences.

Figure 3. Eplan Education Micro-Side [22]

As stated in [5, p.3081] "in consideration of the continuously growing number of the applicants of the CAD/CAE software EPLAN Electric P8 in the industry and educational market, RFH in collaboration with the EPLAN Company has created new international certification models for scholars and students called EPLAN Certified Student (ECS) and EPLAN Certified Technician (ECT). ECS is certification which considers universities and universities of applied sciences, and ECT certification considers vocational schools, master schools and technical colleges. In order to be efficiently prepared on the examination, as a part of the project, scholars and students can use EPLAN Education P8 software for free. It can be downloaded in news version via EPLAN Education micro side and be freely used by students, pupils and trainees for the duration of their training in order to intensify and build upon preceding lessons". The web site to the cooperation, related to the named certification program, is presented in figure 3.

The result of the collaboration is permanently in use, and is becoming still developed. Scholars, as one of the beneficiaries have many advantages out of the certification program.

On the one side, they earn up-to date knowledge, because the content of the certification procedure is becoming permanently updated according to the E-CAD software development and according to the updated methods of the application of the software.

On the other side, the owner of the certificate, owned after theoretical and practical exam, attain in usual case appreciation from the future employer, because employers do not must to invest in employees training any more. This especially, because knowledge necessary to pass the exam corresponds the standard industrial training which is quite cost-intensive. It means, that employers of the certificate owners, can count on financial savings if employing the person which is holder of ECS or ECT certificate.

Figure 4. ECS certificate issued by RFH

Other certification programs jointly developed, offer similar benefits for all stakeholders involved in the project.

CONCLUSION

Analyzing the principles of open innovation model it can be stated that the open innovation model is one of the relevant business success models, also for university-industry cooperation. Many alliances between different intuitions follow the principles of this model, some of them rely on the gradually development of the joint idea and possible R&D activities, without strictly following the categories and contents of the open innovation approach. One such case, the cooperation between university and industrial partner described in this paper, have been presented. The main results indicate that much of the steps in one successful cooperation can be rather common sense based and triggered by circumstances, rather than formally defined. Less formalism, with certain amount of reasonable human and business understanding, can be a success factor for long-term university-industry partnerships.

Note

This paper is based on the paper presented at The 7th International Conference on Mass Customization and Personalization in Central Europe – MCP–CE 2016 – Mass Customization and Open Innovation, organized in Novi Sad, SERBIA, September 21-23, 2016, referred here as [23].

References

[1.] Resnick, Denys (2015) "Why More Companies Are Embracing Open Innovation", Avaliable at <http://www.fastcompany.com/3050661/hit-the-ground-running/why-more-companies-are-embracing-open-innovation>,10.05.2016

[2.] Lehoux, N., D'Amours, S., Lavgevin, A., 2008. A win-win collaboration approach for a twoechelon supply chain: a case study in the pulp and paper industry. European Journal of Industrial engineering, 4(4), pp. 493-514

[3.] Chesbrough, H.W. (2006). Open innovation: a new paradigm for understanding industrial innovation. In Chesbrough, H.W., Vanhaverbeke, W. and West, J. (eds), Open Innovation: Researching a New Paradigm. Oxford: Oxford University Press.

[4.] Roshani, M., Lehoux,N., Frayret,J.M. (2015) "University-Industry Collaborations and Open Innovations: An Integrated Methodology for Mutually Beneficial Relationships, CIRRELT-2015-22, June 2015,pp.1-33

[5.] Dusko Lukac (2016) "Best practice of university-industry collaboration and development of successful certification programs in the domain of electro-cad application by using eplan p8 and e-learning systems", INTED2016 Proceedings, Pages: 3077-3085, Publication year: 2016, ISBN: 978-84-608-5617-7, ISSN: 2340-1079, doi: 10.21125/inted.2016.1715

[6.] Bronwyn H.H., Albert N.L. and John T.S. (2003), Universities as Research Partners, Revised September 2001, Working Paper- University of California at Berkeley and NBER, pp-1-19

[7.] Azaroff, L.V. (1982) Industry-University Collaboration: How to make it work? Research Management, 3, pp. 31–34.

[8.] Pollitt, D. and Mellors, C. (1993) " Making knowledge work through closer ties between town and gown", European Business Review, Vol. 93 Iss: 4

[9.] Richard M. Cyert and Paul S. Goodman (1997) Creating Effective University-Industry Alliances: An Organizational Learning Perspective, Spring 1997, pp.45-57

[10.] Wu, FS. (1994) "The Cultural Impact of University-Industry Research Cooperation: the American Experiences," Sino-South Africa Bilateral Symposium, Taipei, Taiwan.

[11.] Schein, E.H. (1996) Organizational Culture and Leadership (Jossey-Bass Psychology Series), Jossey-Bass; 2 edition (December 5, 1996)

[12.] Duško Lukač, Miroslav Rogić, Jelena D. Rihter, Maria Mikela Chatzimichailidou (2012) "Open Innovation model in the ICT industry — The case of the German Telekom" Telecommunications Forum (TELFOR),20-22 Nov. 2012 , pp. 40 - 51, ISBN:978-1-4673-2983-5, DOI:10.1109/TELFOR.2012.6419144

[13.] Damanpour, Fariborz, 'Organizational innovation: meta-analysis of effects of determinants and moderators" Academy of Management Journal 34, 1992, pp. 555-590.

[14.] Business Council of Australia, Innovation Study Commission Report, Managing the Innovating Enterprise: Australian Companies Competing with the World's Best, 1993, pp.1- 37.

[15.] Weerawardena, J. (2003), "The role of marketing capability in innovation-based competitive strategy", Journal of Strategic Marketing, Vol. 11 No. 1, pp. 15-35.

[16.] Tobias Müller-Prothmann, Nora Dörr: Innovationsmanagement. Strategien, Methoden und Werkzeuge für systematische Innovationsprozesse. Hanser, München 2009, ISBN 978-3-446-41799-1

[17.] Chesbrough, H.W. (2006), "Open innovation: A new paradigm for understanding industrial innovation", in Chesbrough, H.W., Vanhaverbeke, W. and West, J. (Eds), Open Innovation: Researching a New Paradigm, Oxford University Press, Oxford, pp. 1-12.

[18.] CSP Innovative (2016) "How to Systematise an Innovative Cultur2, avaliable at <http://cspinnovate.com/methodology/>, 11.05.2016, 16:58h

[19.] Dahlander, L. and Gann, D.M. (2010), "How open is innovation?", Research Policy, Vol. 39 No. 6, pp. 699-709.
[20.] Oliveira, F and Vicentin, P (2011) "Innovation Process and International Networks in the Brasilian Bioscience Industry, Working Paper, pp. 1-19, Available from < http://www.redesist.ie.ufrj.br/ga2012/paper/FlaviaOliveiradoPradoVicentin.pdf>, 11.05.2016,19:55h
[21.] Elmquist, M., Fredberg, T. and Ollila, S. (2009), "Exploring the field of open innovation", European Journal of Innovation Management, Vol. 12 No. 3, pp. 326-45.
[22.] EPLAN Software and Services GmbH & Co.KG (2016), EPlan Certified Student/Technician, available at < http://www.eplan.education/en/for-students/certi- fication-program/>, 23.05.2016, 16:38h
[23.] Lukac, D. and Chatzimichailidou M.M. (2016), Common sense approach as a basis for successful university-industry cooperation, The 7th International Conference on Mass Customization and Personalization in Central Europe – MCP–CE 2016 – Mass Customization and Open Innovation, organized in Novi Sad, SERBIA

ISSN:2067-3809