Agreeing on expectations

How project management can help balance the ambitions of cooperation

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Agreeing on expectations: How project management can help balance the ambitions of cooperation

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Abstract

Commitment and trust are often mentioned as important aspects of creating a perception of reliability between counterparts. In the context of university-industry collaborations (UICs), agreeing on ambitions and expectations are adamant to achieving outcomes that are equally valuable to all parties involved. Despite this, our initial probing indicated that such covenants rarely exist. As such, this paper draws on project management theory and proposes the possibility of structuring assessments of potential partners before university-industry collaborations are brought to life. Our analysis suggests that project management can improve the perceived success of the relationships in university-industry collaborations. We also find evidence that the initial stages are vital for collaborative success and we confirm that clearly defined, mutually agreed objectives and realistic aims heighten the chances of value-added for all involved parties. Finally, we convey views of the respondents, which may well constitute fruitful avenues for furthering the success of collaborations between universities and industry but without the backdrop of extra administrative layers.

Key words

University-industry collaboration, project management, clarifying expectations, aligning objectives, value creation

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Introduction

Universities have come to play an important role in society as producers and transmitters of knowledge (D'Este & Patel, 2007) and governments around the world are actively encouraging collaboration between universities and private companies (Barnes *et al.*, 2002). This has spurred a growing trend toward greater university-industry collaboration (UIC). Paradoxically, collaboration between universities and industry faces significant challenges and a number of potential conflicts (Bruneel *et al.*, 2010), with the result that the potential benefits of such collaborations are often not realized in practice (Barnes *et al.*, 2002). Especially there is a need to balance on ambitions and agree on expectations when parties have different motives.

A number of studies have found that some of the potential challenges can be overcome if collaborative projects are managed properly from the beginning (e.g. Barnes *et al.*, 2002, 2006; Ruuska & Teigland, 2009). These and other studies have led to the identification of a number of critical success factors that influence the success of projects between universities and industry. For example it has been found that good planning and mutually agreed objectives enhance the chances of successful collaboration. However, there is only a limited literature focusing merely on the establishment and initiation of university-industry (U-I) collaboration. This is the case although it is generally accepted in the project management literature that the initiation of a project is a crucial process (See e.g. Nobelius & Trygg, 2002). This means that deeper questions remain unanswered, e.g. the question of what constitutes good planning in a U-I context?

The purpose of this paper is to investigate how collaborations between scientists from Aalborg University and local SMEs are established, initiated and more importantly, whether the way they are managed has positive or negative effects on the perceived value. The paper draws on the literature on both U-I collaboration and project management. Based on a review of relevant literature, critical success factors related to the matching of partners and the initiation of collaborative projects are identified. Afterwards, 38 U-I collaborations are examined, with the aim of studying to which degree the critical success factors are managed in accordance with recommendations. The aim is to identify best practice and come up with more detailed recommendations on how to manage the establishment, initiation and completion of collaborative projects.

It is clear that not all collaborations between universities and industry are organized as projects. Thus, the process of knowledge transfer between university and industry occurs through a number

of channels such as personnel mobility, informal contacts, published papers, conferences, spin-offs, patenting, consulting relationships and joint research projects (Cohen *et al.*, 2002; D'este & Patel, 2007). However, projects as a means to organize operations and collaborations have become gradually more popular in both public and private organizations (Ruuska & Teigland, 2009). Therefore, this paper finds that it is especially interesting to further illuminate how potential conflicts are managed in projects involving universities and industry.

This paper is original in the sense that it applies a measurement of project success to the investigation on how different project management techniques are utilized in the early stages of U-I collaborations. This provides an opportunity to identify best practice on a more solid foundation than seen in many other studies. Furthermore, very little research has addressed U-I collaborations in a Danish context. The background of this is an assumption that some managerial practices have the potential to enhance the success of the individual partners and that some practices have the potential to enhance the success of all parties. Based on this assumption, the paper seeks to compare the individual parties' perception of project success with the usage of managerial practices. First the potential benefits and conflicts of U-I relationships are discussed. Following this discussion is a review of the literature on how industrial and academic partners identify each other and how U-I collaborations are established. Finally, potential project management strategies are discussed in relation to possible benefits and conflicts.

Establishment and initiation of university-industry collaborations

The objectives of university-industry collaborations

As mentioned in the introduction there is a trend towards greater collaboration between academia and industry. Naturally, these collaborations are established as they are assumed to benefit all parties and the literature has found that U-I collaborations have a number of potential benefits. In this regard Lee (2000) has studied the objectives for collaborating of both companies and scientists. He finds that companies are interested in knowledge resources, research and development activities, network and contacts. Primarily, the companies are interested in research and knowledge related to their existing product line or product/process innovations. According to George *et al.* (2002), U-I collaborations can potentially enhance innovation processes and universities can supplement internal research resources through this medium, thereby leading to lower R&D expenditures whilst upholding the same quality.

Taking another perspective, Lee (2000) finds that the scientists have a number of reasons to collaborate with industry partners. Their primary objectives are found to be; to secure external funding, to gain insight in one's own research and to test application of theory. Likewise, D'Este & Patel (2007) point out that scientists have a variety of reasons for collaborating with industry. In line with Lee (2000) he mentions; additional research income, testing applicability of research, access to industry skills and facilities, and keeping abreast of industry problems. On the matter of external funding Van Dierdonck *et al.* (1990, 558) find that laboratories collaborating with industry receive three times as much external funding as laboratories not collaborating with industry. In addition, Siegel *et al.* (2004) find that scientists that engage in U-I collaboration are often more scholarly productive, despite the fact that it could be argued that scholarly production may be the instigator of U-I collaborations. Concluding, most studies indicate that researchers benefit from collaborating with industry partners.

Though U-I collaboration seems to have a number of potential benefits, these benefits are still often not realized in practice. E.g. Lee (2000) finds that though a majority of the companies in his study felt that they gained access to new research and benefits related to the development of new products/processes, 77 % of the companies still felt that the collaboration with a university made only "moderate or marginal improvement of product quality". In addition almost 82% of the companies felt that 'the faculty contribution to firms' R&D agenda was inconsequential'. This incurred despite the fact that benefits related to their product line were their primary objective. On the other hand, a majority of the scientists in Lee's study were experiencing the collaborations as beneficial. This may indicate that objectives are sometimes conflicting and that creation of mutual benefits is a complex matter.

That the motives of academics and companies are often conflicting is widely acknowledged in the literature. The potential conflicts between university actors and industry actors often relate to the cultural gap between public research organizations and private companies. In general, scientists are oriented towards building reputation, while industry actors face the commercial imperative to produce exploitable results (Dasgupta & David, 1994).

For example both Ruuska & Teigland (2009) and Bruneel *et al.* (2010) find that academics and companies often have different perspectives on the timeframes of collaborative projects. Academics are often working on a long-term basis, whereas companies are often working on a more short-term basis, as they face rapid changes in their environments. When new knowledge is created as a result

of a collaborative project, Bruneel *et al.* (2010) point out that the perspectives of the parties are often changed. Now the academics have an incentive to disclose the results early in order to improve their reputation in the scientific community. The company on the other hand has an incentive to postpone the disclosure of results in order to hold on to a competitive edge. Van Dierdonck *et al.* (1990, 554) refer to this conflict as the dilemma between the "freedom of publication and the secrecy of research findings".

Other potential conflicts may arise due to different attitudes toward intellectual property rights (Bruneel *et al.*, 2010) or differences in languages and values that affect communication (E.g. Elmuti *et al.*, 2005). As it has been established, U-I collaborations hold potential benefits as well as potential conflicts. However, these conflicts may have to be managed already from the establishment and throughout the initiation of a collaborative project in order to realize the potential benefits.

Finding the right partner and the formation of alliances

Choosing the right collaboration partner is an essential element that influences the success of any U-I collaboration (Barnes et al., 2006, 399; Mora-Valentin *et al.*, 2006). A number of attempts have been made in the literature to establish how organizations form alliances and identify collaboration partners. Gulati & Gargiulo (1999, 1476) find that organizations in general tend to seek partners that have "complementary resources and capabilities" and are regarded as reliable counterparts.

In a U-I context Carayol (2003) examines the reasons that lead a firm to select a given academic partner and what would lead the chosen academic to accept or refuse collaboration. He argues, in line with Gulati & Gargiulo (1999), that firms are often trying to avoid uncertainty, which lead them to choose academics with a good reputation. Also the basicity of the scientists' research is important. On the other hand Carayol (2003) finds that the scientists are looking for exploitable synergies and tend to accept or refuse to collaborate under the main criterion that the proposed project does or does not fit their own research agendas.

That both scientists and companies are looking for partners with complementary aims and competencies is confirmed by Barnes *et al.* (2002) and Mora-Valentin *et al.* (2004), who also stress that a thorough assessment of such elements is important in order to ensure project success. The same authors also find that choosing prior collaboration partners or partners with collaborative experience improve the chances of success. This is in line with Thune (2011), who find that companies tend to collaborate with research partners with whom prior relationships have been

established. On that matter Gulati & Gargiulo (1999, 1477) argue that the tendency to enter "secure" partnerships, e.g. by choosing former collaboration partners, may harm the individual actors, as they fail to realize the potential of alternative alliances.

Thune (2011) finds that the tendency to choose prior collaboration partners is often related to an ambition of building mutual experience, before undertaking larger projects. This may be interpreted as trust being a key dimension in U-I collaboration, as it has been found to be in the general literature on inter-organizational relationships (see e.g. Tomkins, 2001). In line with common acknowledgements of the literature on inter-organizational relationships, Thune (2011) and Barnes *et al.* (2002) both emphasize the importance of identifying committed partners and that that commitment and trust are essential dimensions in a U-I context.

However, it is important to notice that actors related to different sectors of economic activity and different fields of science interact differently (Schartinger *et al.*, 2002). E.g. Schartinger *et al.* (2002) find that faculties and companies related to natural sciences, technical sciences and agricultural sciences generally interact more than those in medicine, social sciences and humanities.

To sum up both scientists and companies are generally searching for partners with complementary competencies. Furthermore, project success seems to be positively affected if prior collaboration partners or partners with collaborative experience are matched. Finally, it is stressed that both university actors and industry actors must thoroughly assess potential partners with the aim of identifying committed partners with more or less complementary objectives. The latter point may be addressed by working systematically with filing out the table below.

	Complementary Competencies	Reputation	Assessment	Commitment	Collaboration experience
Enablers					
Barriers					

Table 1: Enablers and barriers in the contact phase

Managing the initiation of university-industry collaborations

As it has been illustrated, U-I collaborations face a number of potential conflicts. However, Barnes *et al.* (2002) have found that project management can improve U-I collaborations, and that a number of project management processes related to the initial stages of the collaboration are vital. Also Ruuska & Teigland (2009) find that a number of processes related to project management could improve project success in collaborative projects involving private, public and academic partners. Both studies identify practices that are related to the initiation of the collaborations, which is an important stage in any collaboration between universities and industry (Philbin, 2008).

Barnes *et al.* (2002) find that clearly defined, mutually agreed objectives and realistic aims are very important in the management of U-I projects. Without such clearly objectives, projects tend to become too broad and exceed their initial boundaries. Likewise, the importance of a mutually agreed project plan is stressed. Effective communications and a competent lead researcher that has the ability to balance objectives were also found to be critical to the success of the collaborations that were studied.

The observations of Barnes et al. (2002) are more or less similar to the results put forward by Ruuska & Teigland (2009). Studying a project involving private, public and academic partners Ruuska & Teigland (2009) find that co-development of a clear project plan is essential if a common understanding is to be established, when a project is initiated. Furthermore, in line with Barnes *et al.* (2002), they stress the importance of the project leader and effective communications in order to continuously balance ambitions and expectations.

Also Anderson *et al.* (2012) examine how projects involving private, public and academic partners are managed and, in line with Barnes *et al.* (2002) and Ruuska & Teigland (2009) they find that a number of actions must be taken to insure project success. They stress the importance of a clear identification and explanation of the motives and goals of each partner. In addition they find that it is important that all partners are given the opportunity to influence decisions affecting the partnership.

As can be seen, there exist some degree of consensus in the literature on management of U-I collaborations. Thus, a number of proposed actions related to the initiation of a project, e.g. project planning and establishing of mutual agreed realistic objectives are found to be important in a number of studies. These elements are not only found in the literature on management of U-I collaborations but are also present in the more general literature on project management (Fortune &

White, 2006). But in most cases the literature gives very little guidance on how to establish objectives and mobilize good planning in practice.

In addition, Thomas *et al.* (2008) argue that planning is not enough. Also the "project team" that is responsible for implementation and execution of the plan is important, as collaboration is initiated. Thomas *et al.* (2008, 107) suggest some actions that may improve the project team in a project initiation process. They stress the importance of developing the relationship between the members, e.g. at a kickoff meeting. Furthermore, the boundaries of the project must be set and the project manager must provide clarity and direction.

Summing up, a number of project management activities seem to be pivotal in the initiation stage of projects in general and U-I projects in particular. The below table lists some of the critical success factors that are identified across a range of studies.

	Planning	Objectives	Team building	Establishment of boundaries	Communication
Enablers					
Barriers					

Table 2: Enablers and barriers in the initiation phase

Methodology

Defining and measuring success is generally not easy in inter-organizational settings (Gulati 1998, Zollo *et al.* 2002) and there is not a single definition of what success is and how it can be measured in U-I relationships (Thune, 2011). As a result mostly subjective assessments based on participants perception has been used to measure performance and success (see e.g. Barnes et al., 2002; Mora-Valentin et al., 2004). Attempts at operationalizing more objective type measurements have been made by applying the collaboration-continuum as a measure of success (Cyert & Goodman, 1997; Mora-Valentin *et al.*, 2004). However, this is not regarded as a feasible route in this study, as projects are defined as being limited in time (Kerzner, 2009). Therefore, this paper measures success as the parties' perceived degree of goal achievement. In line with Barnes *et al.* (2002) this measure is then balanced with more objective measures, including:

- Meeting budget constraints
- Number of product/process innovations that are completed
- Contractual renewal of collaboration

Data collection

The empirical foundations of this paper are 72 semi-structured interviews conducted over the period 2011 to 2012. We aimed at identifying university-industry collaborations that covered projects between companies and researchers on the one hand, and companies and students on the other. Identifying company/researcher collaborations was done with the help of Aalborg University's contracting unit official database, whilst the identification of company/student collaborations was done by active search and contact with the various departments at the university. The respondents were selected so as to give a balanced insight into different types of collaboration, different stages of collaboration, and different project sizes.

The interview form was semi-structured, probing into five themes, which reflected the purpose of the paper, and these in turn therefore constituted the main sections of the interview guide:

1. Introductory questions concerning the respondent and his/her organisation
2. Questions addressing the different phases of a collaboration:
    a. Contact phase
    b. Initiating the collaboration
    c. Project phase: conceptualizing, planning, executing
    d. Completion phase: concluding, evaluating renewing
3. The overall cooperation of the relationship

During the interview process we made use of asking for extensive amounts of examples and stories as reflexive-type questions much in the manner described by Kreiner & Mouritsen (2005). In this way we aimed at forcing the respondents to explain what really goes on during their workday and also to stimulate them to provide details and thoughts that were more detailed than we otherwise would expect to get.

Analyzing the data

Immediately after finishing each interview the interviewer wrote a brief resume of the main points according to the 3 themes of the interview guide. Here we aimed at noting down exceptional examples or particularly interesting points being made. The interviews were transcribed in their full length and we applied a structural coding approach in the analysis of them along the lines of Krippendorff's (1980) recommendations. This coding tree was based on the full interview guide. After coding the interviews, a list containing the drivers of collaboration and project management considered critical by the interviewed respondents was prepared. The data-analysis was initiated by looking for patterns relating to the respondents' views on the search and initiation processes. After this the data was analysed with respect to identifying patterns between these stages of a UIC and its success rate.

Discussion of empirical findings

Our interviews generally covered the whole project from beginning to end, as this was more natural to discuss it as a whole rather than focussing on specific parts. As such our analysis of the empirical data for the sake of this paper takes its point of departure in the initial phases, but also turns to the termination phase in order to establish links between initiation and the degree of project success.

Finding the right partner and the formation of alliances

In relation to the contact phase, our theoretical framework suggested that six factors were relevant to analyze and discuss, namely: an analysis of complementary competencies, reputation of the partners, prior assessment of partners, establishing commitment, past collaboration experience, and contact. Table 3 below depicts a series of statements from our analysis. The first noticeable characteristic of the data is that seemingly, reputation does not play a significant role in the search process between universities and industry. This is contradictory to existing theory but is potentially explained by the unique setting of Aalborg University as mainly being a regional player and the fact that most collaborations are with SME's who do not have aspirations of working with universities in other regions, countries or continents. Despite this, we did have aspirations of finding evidence that the choice of researcher/company contact to some extent was explained by reputation on the level of the individual. This clearly not being the case, we may insinuate that our dataset is comprised of respondents that are unbiased from the beginning of the collaboration and who rely on assessing the partner rather quickly in the contact phase.

	Complementary competencies	Reputation	Assessment	Commitment	Collaboration experience	Contact
Enablers	Company finds that researchers have unique competencies Researcher has competencies relating to project management		Scientist and company have engaged in prior interaction – assessment not necessary Company assessed a number of potential partners	Trust between the parties	Company has extensive collaboration experience Company has extensive collaboration experience Both parties have extensive collaboration experience Company has extensive collaboration experience	Network. External consultant facilitates contact Scientist contacts company with project proposal Contact is facilitated through network Researcher takes contact with ideas Shared initiative
Barriers	University has theoretical competencies, company has practical competencies: they are difficult to match		Company had very little knowledge of scope and terms – limited assessment of partner and projects Very little assessment	University is often not committed to business partners Company is most committed Company is committed from the beginning Company finds it hard to commit to project in busy periods, paying attention to customers comes first in line	Company has no collaboration experience Extensive collaboration experience	Uni. Identifies comp. and take contact through network Formalized continuous contact Company takes contact with ideas

Table 3: Enabler and barrier patterns in the contact phase

Our data illustrates the importance of the contact phase for a UIC. Therefore we might also expect to find structural arrangements or formalized processes and procedures that enable a smooth partner search and selection in order to increase the chances of good collaboration. However, we can conclude that the search process is often characterized by the use of informal connections. This means that the assessment of potential partners is often limited because network connections are trusted partners, and even though the selection process may move outward in the companies' or researchers' networks, this lacking formalization and assessment continues to pertain. In line with theory it is found that companies tend to contact prior collaboration partners, when looking for potential partners, and this is something that could pose a potential problem for the value creation in UIC's moving forward, especially in the case of the regional setting that Aalborg University is a part of.

Also in relation to the contact stage, our dataset indicates that contact seems primarily to be initiated from the researchers and students' perspectives, i.e. students asking for company access to write a project report or researchers informing the company of a potential joint research project. However,

there are a multitude of different initiatives being taken from the Aalborg University matchmaking unit in the past year, so these results may be altered dramatically if new data were to be added. There is no doubt that the respondents in our dataset have difficulties in finding their way to the university, yet alone the right partners in the university. Local marketing through e.g. media, seminars and conferences such as the InnovationX conference series are good examples of communication channels that can potentially lead to contacts. In relation to e.g. InnovationX and seminars to corporate managers, we suggest that researchers be more open, or should we say aggressive, about communicating which types of companies they would like to get in touch with and which problems they would like to study in these companies. Concrete suggestions in this line could be a standard Powerpoint introduction slide with marketing-points aimed at researchers presenting to external stakeholders that helps them to emphasize this and a formalized cooperation with the business networks of the local governments and Connect Denmark.

The real problem that needs to be overcome is that a lot of this knowledge is intrinsic, so it builds itself up around the partners within researchers, students, companies and matchmakers; and then it leaves! This is emphasized by the findings that partners with extensive collaboration experience tend to conduct more successful projects; in part due to the fact there is a learning curve in identifying complementary competences, which is confirmed to be a major criteria of value creation from the perspective of business.

Managing the initiation process

The initiation phase is analyzed through the five components: planning of the project, defining the objectives, team building and personal capabilities, establishment of boundaries such as legal contracts and rights to the output, and finally communication between the collaborating partners. By looking at table 4, it is interesting to see that there is a hole in our data concerning the positive effects of establishing boundaries such as legal contracts and rights to potential output of the project. This is a rather interesting outcome as it contradicts existing knowledge in the field. In line with Tomkins (2001), formal agreements and Non Disclosure Agreements are found to help build trust between partners. However, the projects we studied had a tendency to be initiated before formal agreements had been made, and as this process at the central Aalborg University contract-unit, at least in the words of the respondents, works very slowly, potential problems, e.g. in relation to intellectual property rights are prone to arise.

One possible explanation of the lack of boundaries early in the process is that the establishment of boundaries is a continuous process, and not necessarily something that is done at the outset of a UIC. This, of course, poses both potential problems and potential advantages, the latter relating to flexibility in outcomes and the ability to optimize the project focus during its course of action. With regard to the former, i.e. potential problems, the predicted outcome of this is that when projects go wrong, then they tend to go very wrong. As such we suggest action to be taken in relation to focusing on the establishment of boundaries, but in such a manner that the partners do not feel overly bureaucratized, and thus be a key focus in future developments.

	Planning	Objectives	Team building/personal capabilities	Establishment of boundaries	Communication
Enablers	Deadlines are appreciated Company finds planning stage fine (The project is described), but the university administration works slowly Company arranges first meeting and proposes ideas Upon the first meeting researcher proposes a research design and a plan in order to balance expectations in the early stages Ongoing dialog with the purpose of understanding each other's agendas and objectives	Negotiated and balanced from the beginning. Mutually agreed objectives from the beginning Scientist defines scope, company balances and accepts Objectives are formally agreed – including research output Milestones and formal deadlines Researcher defines the initial objectives – company accepts. Afterwards the final more detailed objectives are derived from workshop activities	Researcher has a great 'drive' A project management group is formed with success – all partners are present and active		Researcher: communication was adjusted and improved over the period Intensive communication in the early stages - Less communication in the later stages Researchers are introduced to the field to promote mutual understanding The objectives of each part is clearly communicated
Barriers	Extensive planning takes place. But university parties are not committed to plan Milestones were established. But not entirely in accordance with objectives Balancing of expectations is not sufficient Terms should be balanced in an ongoing process There is a lack of follow-up meetings	Scientists have theoretical ambitions, company has practical ambitions. Ambitions are not balanced Company has a number of ideas and objectives – these are negotiated and balanced to fit researchers ambitions and objectives However, the company in retro perspective found that it did not have the capacity to define the right objectives		NDA takes a long time to move through University administration – Project is initiated before the completion Formal agreements are made. The process works very slowly leading to potential problems related to IP rights	Cultural gap makes communication difficult Different objectives and practices must be clearly communicated Culture gap present in administration and timeframe

Table 4: Enabler and barrier patterns in the initiation phase

With regard to the planning component of the initiation phase, this was found to be an important instigator for the perceived project management success and thereby also the evaluation of the collaboration on a day-to-day basis. Here the company respondents in general appreciated the use of milestones, deadlines, balancing out expectations and agreeing on objectives, and not surprisingly, much dissatisfaction was related to lack of commitment to the plan from the researchers' side, the lack of alignment between milestones and objectives (i.e. here a difference between project

management success and project success), and a lacking focus on follow-up meetings. It was specifically commented that researchers often propose a research design from the beginning and that initial negotiations tended to depart from this design, thus leaving open to debate whether the objectives of the companies were sufficiently incorporated.

It is an interesting challenge that companies appreciate the establishment of formal deadlines; students are forced to live by them; but researchers do not necessarily feel comfortable in such an environment. Companies were clear in stating that milestones must be agreed on from the beginning. However, some projects tend to forget the initial milestones and change scope; which could be both good and bad. Sometimes objectives are communicated and balanced from the beginning, but projects are not carried out in accordance with agreements, as a result of limited communication beyond the initiation stage.

The arguments posed above both relate to an important point to be taken from this study, namely that flexibility should be incorporated but that this generally craves a better communication between the partners. This can potentially be achieved without too big an administrative setup, e.g. through the use of project Wiki's, project management tools like Podio or the correct use of a Google Docs setup. An efficient setup gives a quick overview and pushes only relevant messages to the partner on changes in schedule. In testing some of these tools, we have unfortunately found some hindrances in Aalborg University's IT setup, which does not allow for such collaboration with external stakeholders when systems are setup by the university.

It can hardly be surprising that the objectives of each partner ought to be identified and communicated from the very beginning. Afterwards, the involved partners should negotiate with the aim of balancing and agreeing on expectations and objectives. Hence we suggest the use of formal – but non-contractual – agreements that specifically state the roles and responsibilities of each partner and which clarifies the value that each partner gets from the collaboration. While this is general practice in industry, it may comprise new ground for many researchers. We also find further evidence that a distinct culture gap between universities and companies does exist. This is not necessarily a problem, but it is important that it be recognized and managed. This means agreeing on expectations and planning the process from the very beginning of the project. Finally, there is the problem of time horizon between university and industry, which must be taken into account at the outset of a UIC.

Interestingly the formation of a project management team is rarely mentioned. Actually, in our data we encounter only one occasion where such a team is formed to contribute to the success of that specific project. This is surprising, as Nielsen et al. (2012) argue that the formation of a project team is an important aspect of creating good project management.

Generating project success or not

The causes of success and non-success of UIC's was also analyzed in our dataset. Success was to a large extent found to be driven by companies' gain of valuable knowledge and for the companies it was projected as a success that results predominantly matched the initial expectations set out in the initialization phase. This did not entail that every depicted expectation had to have been met. For researchers, product and process innovation was an important milestone for success and several researchers stressed that the collaboration could be good, despite the results being ordinary. Therefore there is a slight misalignment between perceived successes, although not critical. Interestingly, this means that while researchers can perceive UIC's as successful already before they are finished, companies are more reluctant to do so.

Concluding remarks

The strong emphasis on utilizing existing networks only strengthens the fact that the reputation of the scientists has not been found to play any particular role. In the long-term, this may pose a potential problem that private networks play such a large role, in turn leaving little leeway for new partnership constellations. Therefore, action should focus on mixing the cards in a better fashion, not through mandatory matching but through a better marketing exercise, whose primary responsibility must lie with the researchers.

Action should also focus on easing selection processes both for companies, students and researchers. Work must be done in relation to creating structural arrangements or formalized processes and procedures that enable a smooth partner search and selection in order to increase the chances of a good collaboration. Why is it for example that industry has access to online recruitment systems that test and match personal profiles, while UIC's do not recognize this aspect at all? We also suggest action to be taken in relation to focusing on the establishment of boundaries,

but in such a manner that the partners do not feel overly bureaucratized, and that this should be a key focus in future developments.

Respondents continuously emphasized the need for better communication between the partners. This can potentially be achieved without too big an administrative setup, e.g. through the use of project Wiki's, project management tools like Podio or the correct use of a Google Docs setup. An efficient setup gives a quick overview and pushes only relevant messages to the partner on changes in schedule. In testing some of these tools, we have unfortunately found some hindrances in Aalborg University's IT setup, which does not allow for such collaboration with external stakeholders when systems are setup by the university.

Finally, our dataset may potentially play an important role in defining future objectives of university-industry collaborations. We suggest challenging the traditional objectives of these UIC's by using formal agreements that specifically state the roles and responsibilities of each partner and which clarifies the value that each partner gets from the collaboration. This would entail analyzing and agreeing on common value creation and the value creation for each partner as well for example creating flexible contracts. In Nielsen & Sort 2012, this is exemplified through the analysis of the UCI as a business model proposition.

References

Anderson, T.S., Michael, E.K. & Peirce, J.J., (2012), "Innovative Approaches for Managing Public-Private Academic Partnerships in Big Science and Engineering", *Public Organization Review,* 12:1, 1-22

Barnes, T.A., Pashby, I.R. & Gibbons, A.M., (2002), "Effective University-Industry Interaction: A Multi-case Evaluation of Collaborative R&D Projects, *European Management Journal,* 20:3, 272-285

Barnes, T.A., Pashby, I.R. & Gibbons, A.M., (2006), "Managing collaborative R&D projects development of a practical management tool", *International Journal of Project Management,* 24, 395-404

Bruneel, J., D'Este, P., Salter, A., (2010), Investigating the factors that diminish the barriers to university-industry collaboration, *Research Policy*, 39, 858-868

Carayol, N., (2003), "Objectives, agreements and matching in science-industry collaborations: reassembling the pieces of the puzzle", *Research Policy,* 32, 887-908

Cyert, R.M. & Goodman, P.S., (1997), "Creating effective university-industry alliances: An organizational learning perspective, *Organizational Dynamics,* 25:4, 45-57

Dasgupta, P. & David, P., (1994), "Toward a new economics of science", *Research Policy,* 23, 487-521

D'Este, P. & Patel, P., (2007), "University-industry linkages in the UK: What are the factors underlying the variety of interactions with industry?", *Research Policy,* 36:9, 1295-1313

Elmuti, D., Abebe, M. &Nicolosi, M., (2005), "An overview of strategic alliances between universities and corporations, *Journal of Workplace Learning,* 17:1, 115-129

Fortune, J. & White, D., (2006), "Framing of project critical success factors by a systems model", *International Journal of Project Management,* 24, 53-65

George, G., Zahra, S.A. & Wood, D.R., (2002), "The effects of business–university alliances on innovative output and financial performance: a study of publicly traded biotechnology companies", *Journal of Business Venturing,* 17, 577-609

Gulati, R., (1998), "Alliances and networks", *Strategic Management Journal*, Vol. 19, 293-317

Gulati, R. &Gargiulo, M., (1999), "Where do interorganizational networks come from", *American Journal of Sociology,* 104:5, 1439-1493

Kerzner, H., (2009), *"Project management: a systems approach to planning, scheduling and controlling",* 10th ed., Hoboken, New Jersey: John Willies and Sons Inc.

Lee, Y.S., (2000), "The sustainability of university–industry research collaboration: an empirical assessment", *Journal of Technology Transfer* 25, 111–133

Mora-Valentin, E.M., Montoro-Sanchez, A. &Guerras-Martin, L.A., (2004), "Determining factors in the success of R&D cooperative agreements between firm and research organizations", *Research Policy,* 33, 17-40

Nielsen, C., J.C. Sort & M.J. Bentsen. 2012. Creating levers of management: Project management as an instigator of value creation in different stages of university-industry collaborations. Working paper, Department of Business and Management, Aalborg University.

Nielsen, C. & J.C. Sort. 2012. How is value created and exchanged in different stages and different types of university-industry collaborations? Working paper, Department of Business and Management, Aalborg University.

Nobelius, D. &Trygg, L., (2002), "Stop chasing the Front End process – management of the early phases in product development projects", *International Journal of Project Management,* 20, 331-340

Philbin, S., (2008), "Process model for university-industry research collaboration", *European Journal of Innovation Management*, 11: 4, 488 - 521

Ruuska, I. &Teigland R., (2009), "Ensuring project success through collective competence and creative conflict in public-private partnerships – A case study of Bygga Villa, a Swedish triple helix e-government initiative", *International Journal of Project Management,* 27, 323-334

Schartinger, D., Rammer, C., Fischer, M.M. &Fröhlich, J., (2002), "Knowledge interactions between universities and industry in Austria: sectoral patterns and determinants", *Research Policy,* 31, 303-328

Siegel, D. S., Waldman, D. A., Atwater, L. E. & Link, A. N., (2004), "Toward a model of the effective transfer of scientific knowledge from academicians to practitioners; qualitative evidence from the commercialization of university technologies", *Journal of Engineering and Technology management*, 21, 115-142

Thomas, M., Jacques, P.H., Adams, J.R. & Kihneman-Wooten, J., (2008), "Developing an Effective Project: Planning and Team Building Combined", *Project Management Journal,* 39:4, 105-113

Thune, T., (2011), "Success Factors in Higher Education-Industry Collaboration: A case study of collaboration in the engineering field", *Tertiary Education and Management*, 17:1, 31-50

Tomkins, C., (2001), "Interdependencies, thrust and information in relationships, alliances and networks", *Accounting, Organizations and Society,* 26, 161-191

Van Dierdonck, R., Debackere, K. &Engelen, B., (1990),"University-industry relationships: How does the Belgian academic community feel about it?", *Research Policy*, 19, 551-566

Zollo, M., Reuer, J. T. & Singh, H., (2002), Interorganizational Routines and Performance in Strategic Alliances, *Organizational Science*, vol. 13, no. 6, 701-713