Creating levers of management

Project management as an instigator of value creation in different stages of university-industry collaborations

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Creating levers of management: Project management as an instigator of value creation in different stages of university-industry collaborations

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Abstract

This paper reports a longitudinal multi-case research project encompassing 72 semi-structured interviews carried out in 2011 and 2012. The interviews covered topics of the collaboration type, the initiation of the collaboration and details concerning the planning of the collaborations. In addition the interviews focused on the relationships between the people involved and as such also on the effects of project management. We distinguish between project management success and project success and try to identify best practices according to which dimensions such practices must distinguish themselves from non-best practices. The paper concludes that whereas project management success was not found to be causally related to project success, there seems to be a clearer link between project management success and to ensuring effective use of resources in both companies and universities. There is also evidence to the fact that it is problematic when corporate managers think they can run research projects like lean-based production companies.

Key words

University-industry collaboration, project management, project success

KASK:VIE VIDENSAMARBEJDE INNOVATION ENTREPRENØRSKAB

DEN EUROPÆISKE UNION Den Europæiske Fond for Regionaludvikling

Interreg IV A ÖRESUND – KATTEGAT – SKAGERRAK

Introduction

In an environment of increasing international competition, rapid technological change and globalization there has been a trend towards collaboration between organizations (Otley, 1994; Gulati & Gargiulo, 1999; Castells, 2000; Grabher, 2002; Batonda & Perry, 2003; Håkansson & Lind, 2004; Barnes *et al.*, 2006). At the same time governments are encouraging collaboration between universities and industry with the aim of promoting innovation and strengthening wealth creation (Barnes *et al.*, 2006; D'Este & Patel, 2007; Lundvall *et al.*, 2008) a notion which is at the very center of the Mode 2 society (Gibbons 2000) and the Triple Helix movement (Etkowitz & Leydesdorff 2000). This has spurred a growing trend towards greater collaboration between universities and industry (Barnes *et al.*, 2002) and there has been a rise in commercial knowledge transfers from universities to practitioners (Siegel *et al.*, 2003).

To the individual company university-industry collaborations have several potential benefits; technology and expertise, enhanced reputation and image, skill development, enrichment of corporate values and culture, technology testing and development, new perspectives, recruiting and retention, etc. (Austin 1998; Kanter 1999; Austin 2000). From the perspective of the university and the scientists university-industry collaborations have the potential to provide funding, to provide insight in own research and to test application of theory (Lee 2000, cf. Carayol 2003, 890). In addition Siegel *et al.* (2003) find that scientists that collaborate with companies often have a higher scholarly productivity.

However, the benefits mentioned above are often not realized in practice (Barnes *et al.*, 2002) and there are several barriers to successful collaboration between universities and industry (Bruneel *et al.*, 2010). This indicates that collaborations between universities and industry need to be managed in order to optimize the value creation process. In the process of innovation, project management is often a key activity (Shenhar & Dvir, 1996) and project management has been found to hold the potential to optimize the value creation in university-industry collaborations (Barnes *et al.*, 2002). But still the question on how project management can fulfill the potential of university-industry collaborations has not yet been fully illuminated (Shenhar & Dvir, 1996).

Therefore, the purpose of this paper is to investigate how project management is used in collaborations between scientists and students from Aalborg University and local SMEs. The paper is original in the sense that it investigates how project management is applied in different stages of a collaborative research project. This approach has been chosen under the assumption that projects

need to be managed in different ways at different stages in their life-cycle. The aim of the paper is to derive recommendations on how to apply project management in different stages of university-industry collaboration projects.

The scope of the paper is in some regards similar to the focus of Barnes *et al.* (2002). However, this study is conducted in a Danish context and furthermore this study includes a wider range of industries and scientific fields. Finally, the incorporation of the stage model approach contributes to the originality of the paper. The remainder of this paper is structured so that the next section describes the theoretical framing of the paper by looking into the value proposition of university-industry collaboration on the one side and the evolvement of inter-organizational projects on the other hand. Finally, this section dwells on the notions of project management and project success. The next section explains the applied methodological approach, while section 4 contains the empirical evidence and analysis. Finally, the paper is concluded upon in section 5.

The theoretical framework

The value of university-industry collaboration

As mentioned in the introduction there is a growing trend towards greater collaboration between universities and industry (Barnes *et al.*, 2002) and there has been a rise in commercial knowledge transfers from universities to practitioners (Siegel *et al.*, 2003). This indicates that both scientists and companies have incentives to collaborate in order to create mutual benefits/value.

However, companies and scientists often perceive value in different ways, which give them different motives for collaborating. Thus, university scientists are often motivated by recognition within the scientific community and the ability to make publications, whereas companies are normally motivated by the opportunity to commercialize new knowledge in order to generate a financial gain (Siegel *et al.*, 2003).

The above-mentioned variety of motives often creates conflicts of interest between scientists and companies. Bruneel *et al.* (2010) argue that conflicts arise in relation to both the orientation of the parties and in relation to the transactions between the parties. For example they mention that university research is often purely orientated towards science and, contrary to most companies, has a long-term orientation. In addition they find that companies often experience conflicts concerning

the intellectual property rights when interacting with universities. From the perspective of the scientist, there is a conventional perception that there is a tradeoff between involvement in industry collaborations and scholarly productivity (Siegel *et al.*, 2004, p. 132).

Despite of the potential conflicts scientists and companies still engage in collaboration. This spurs the need for university-industry projects to be managed (Dodgson, 1991, cf. Barnes *et al.*, 2002) in order to mitigate barriers and deal with potential conflicts. Furthermore, there is a need to question conventional perceptions of university-industry collaborations. For example, both Siegel *et al.* (2004) and Zucker & Darby (1996) find that the tradeoff between industry collaboration and scholarly activity does not always exist. Actually, they find that scientists engaged in collaborations with companies are sometimes more scholarly productive.

How do inter-organizational projects evolve?

The earlier mentioned increase in inter-organizational relationships, have made academics try to establish what relevant variables influence the success and failure of a relationship, (cf. Batonda & Perry, 1), but very little attention has been directed toward how networks develop (Anderson *et al.*, 1994; Håkansson & Snehota, 1995). There are several different approaches in the field (Batonda & Perry, 2003). Bertonda & Perry (2003) describe three major directions in the area: stages theory, states theory and joinings theory. The stage theory contains two main theories: life cycle models (Bertonda & Perry, 1458) and growth-stages models (Bertonda & Perry, 1458). Both theories are focused on how inter-firm networks gradually develop through sequential stages, and over a period of time (Ford, 1980; Van de Ven, 1992; Batonda & Perry, 2003). States theory comes from a different school of thought, and opposes the sequencing in stage theory. Instead the state theory suggests that actors in a cooperation move randomly from one state to another (Anderson *et al.,* 1994; Håkansson & Snehota, 1995; Bell, 1995; Ford, 1997; Batonda & Perry, 2003). Joinings theory is more centered on what happens at the beginning of a network and how the entry has a major influence on what happens afterwards. (Thorelli 1986, Batonda & Perry 2003).

Drawing on these studies Batonda & Perry (2003) conclude that companies that are new in network settings often tend to think of the collaborations as following a sequence of stages, as suggested in the stage model. More established companies or network-based companies tend to accept the approach of the states theory. Furthermore Bertonda & Perry (2003) conclude that joining theory is not applicable when focusing on inter-firm network development. This study will utilize these

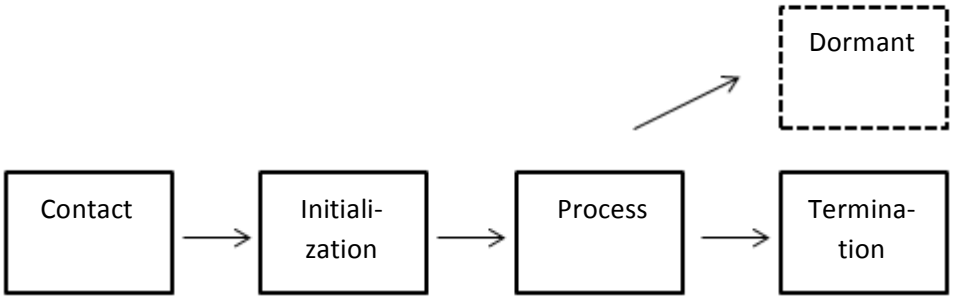
experiences when conducting the research, but before outlining the specific use, it is necessary to describe the context of inter-organizational projects that is the focus area of this study.

Distinguishing between Inter-organizational relationships/networks and Inter-organizational projects

Grabher (2002) notes that the focus in the literature concerning inter-organizational relationships has shifted from focusing on joint ventures and strategic alliances before the 1990s, towards networks in the 1990s and most recently the focus has now shifted to projects. Given that actors are striving for more fluid and market-responsive organizational forms, hence the attention towards projects. (Lundin and Söderholm, 1995; Midler, 1995; Lundin and Midler, 1998; Lindkvist *et al.*, 1998; Ekstedt *et al.*, 1999; Hobday, 1998, 2000; Gan and Salter, 2000). Thereby following the thoughts of Grabher (2002), projects are not that different from networks and both are branches of inter-organizational relationships. Despite of this, Grabher (2002) points out some underlying characteristics such as projects in terms being of short-cyclical nature, more flexible, but can also entail high-risk and high-stakes outcome, and have less safeguards (Storper, 1997; Grabher, 2002) that minimize the likelihood of failure. These characteristics get less distinct, when relationships lead to more projects and thereby a project-based organization. (Grabher 2002). Kerzner (2009), in line with Grabher (2002), defines a project, as a series of activities and tasks that have a specific objective to be completed within certain specifications. He further notes that projects often have defined start and end dates, funding limits, and consume various kinds of resources across several functional lines.

How can the evolving of projects be categorized in the study's context?

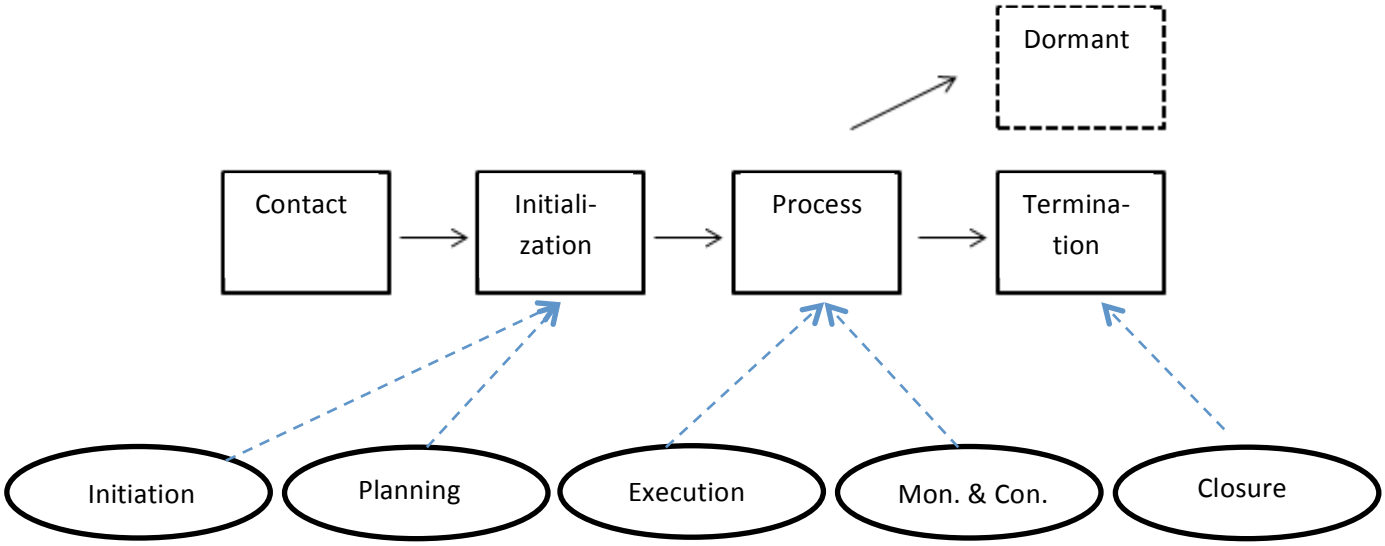
When taking into account both Grabher's (2002) and Batonda & Perry's (2003) considerations, it is feasible that the stage theory model developed by Batonda & Perry is applicable on this study, given that Grabher (2002) points towards little differences between network relationships and project collaborations. Furthermore the context of university-industry collaborations is considered often to be closer to the new companies in networks settings (especially student projects) described by Batonda & Perry (2003), why the stage theory will be the preferred option, but keeping the states theory in mind. In this study we apply the following stages that projects are assumed to undergo: contact, initialization, process and termination (plus dormant).



The contact stage is where the university and company consider how and why to make the contact and subsequently who is the proper to contact and how to contact this person/company/institution. This stage relates to Batonda & Perrys (2003) 'searching process'. The initialization stage encompasses how the project is started, for example the first physical meeting and matching of expectations takes place, called 'starting and development' by Batonda & Perry (2003). The period where the actual project is ongoing, is called the process stage, where elements like conceptualizing, ongoing knowledge transfer, planning and execution takes place, known as 'ongoing maintenance' from Batonda & Perry (2003). The last of the active stages are the termination stage (same name as Batonda & Perry, 2003), where the projects results and evaluation are shared and if wanted a renewal process. Based on the findings of Batonda & Perry (2003) the dormant stage is also included in the stage model. The dormant stage is where some projects become inactive due to change in business and/or the project has failed to meet the individual requirements.

Project management

As mentioned earlier, Kerzner (2009) defines a project as a series of activities and tasks that have a specific objective to be completed within certain specifications. Kerzner (2009) further defines project management as a number of processes designed to make better use of existing resources. He further identifies five groups of processes that constitute project management; 'project initiation', 'project planning', 'project execution', 'project monitoring and control', and 'project closure'. Each of these groups contains a number of sub-processes that relate to different stages of a project.



'Project initiation' and 'project planning' relate to the *initialization stage* and for example involves the selection of a project, the establishment of objectives, the definition of requirements and the scheduling of activities. The groups 'project execution' and 'project monitoring and control' involve processes such as the direction and management of activities, and the comparison of actual outcome to predicted outcome. These processes are related to the *process stage*. Finally the 'project closure' involves both financial, contractual and administrative closure and evaluation. These processes are related to the *termination stage* (Kerzner 2009).

Distinguishing between project success and project management success

Project management is in terms a number of processes that are undertaken with the purpose of ensuring project success. But what is project success and what constitutes successful project management? Cook-Davis (2002) argues that there is a distinction between 'project management success' and 'project success'. Project management success can be measured as the degree of on-time and on-cost performance, whereas project success is seen as the amount and size of anticipated benefits. Cook-Davis (2002) further identifies a number of factors that promote the two types of success.

Shenhar *et al.* (2001) also investigate the concepts of project success and contrary to Cook-Davis (2002) they find that project success can be described along four dimensions with different time frames. In the short term projects are successful if meeting initial constraints and making an impact

on the company's customers. In the longer term projects are considered to be successful if they have a direct impact on the success of the business or if they prepare the company for future shifts in technology or business.

Both Cook-Davis (2002) and Shenhar *et al.* (2001) focus on projects that are carried out within a single organization. But what constitutes project success, when projects are undertaken in collaboration between separate organizations? In general it is difficult to assess the value and performance of collaborations (Gulati, 1998; Zollo *et al.*, 2002). Therefore, Barnes *et al.* (2002), in their case study of six university-industry project collaborations, evaluated the success of each collaborative project on the basis of key participants' general perception of success, which is more or less in line with the approach of Cook-Davis (2002). These subjective measures were then balanced with objective measures such as the number of published journal papers, the number of filed patents and/or evidence of innovation (Barnes *et al.*, 2002, p. 273).

Barnes *et al.* (2002) further identified a number of project management issues that were found to influence the success of the different projects. They found that clearly defined, mutually agreed objectives and realistic aims were crucial to the success of collaborative projects. Furthermore they found that good project planning and progress monitoring helped to increase the progress of the projects. Finally they found that the role of the lead researcher had an impact, and that effective communications were pivotal to the success of the projects. Below, these issues are structured according to the stages of a project to illustrate, where and when each process is relevant.

	Project 1	Project 2	Project n
Contact			
Initialization			
Process			
Termination			

Data and research methodology

The examination of how project management affects project collaborations between universities and industry constitutes the empirical part of this paper. A qualitative approach will be used to address this issue, and the study is based on semi-structured interviews with the 72 key participants

from collaborating organizations, where the respondents have been the main contacts and responsible project managers from both the university and the companies.

Data collection

The empirical foundations of this paper are 72 semi-structured interviews conducted over the period 2011 to 2012 around a total of 38 university-industry collaborations. Each interview ranged from between 60 minutes to 90 minutes. 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 form of interviewing chosen was based on the principle of dialogue between the interviewer and the respondent (Kvale, 1996) and has some similarities with the type of interview that Yin (1994, 84) calls "focused interviews". The interview guide is divided into sections from the stage model and questions about these, added follow up questions. The emphasis in the interview is not to strictly follow the guide, but let the respondent talk freely, naturally still making sure to address all main topics. To secure that the needed data was collected there were at least 2 interviewers present at each interview, one talking and ensuring a good interaction with the respondent, and one taking notes and securing that all main topics were covered, this approach is also suggested by Yin (1994). The interviews probed into five themes, which reflect 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 three 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 project management, project success and project management success considered critical by the interviewed respondents was prepared. The data-analysis was initiated by searching for patterns in the subsection of the case study database that was specifically focused on the codes for this paper. From this a set of working hypotheses was generated and they were supported through analytical generalization.

Empirical analysis

In this research project on university-industry collaboration we have encountered three types of respondents lodged into two types of cooperation. On the one hand we have projects between researchers and companies and on the other hand projects between students and companies. Initially we will treat these two groups separately however, we will attempt to synthesize differences, common ground and possibilities for creating synergies between them. Our interview guide, as described above, probed the respondents' description of the collaborations in stages relating to the drivers of contact, initialization of the project and its conceptualization, the planning and actual execution of the project to its completion, evaluation and in some instances thoughts about continuance of the collaboration.

Do respondents consider project management important?

In general the answer to the question above is yes. Despite the fact that the notion of project management has a tendency to be stronger from a corporate perspective, several respondents on the industry side also reflected upon the interaction with the university as a space where more flexibility is needed. Some respondents expressed that engaging in *process* was a major reason for collaborating with the university – and posited that this was at the same time the risk of collaborating with universities – a risk that therefore could be perceived from a positive stance also. The synthesis of this view was that it was important to be aware of such aspects before engaging in a collaborative agreement and that therefore it is important to be explicit about which types of projects that fit with a university-industry setting and which that do not. One respondent commented:

> "When you work with this type of project it helps to have the viewpoint that you can learn from everything. There are many aspects that are difficult to predict (in such a project), and how things will go"

The general perception of the companies in relation to cooperating with researchers was that they were the ones with the greatest incentive to ensure that the projects maintained momentum. In our analysis of UIC's, researchers tended to be more focused on the outcomes of the project – in terms of new knowledge – and regardless of deadlines. Almost as in a caricature of common understanding, one respondent described his ordeal with the university researchers:

> "The schedule of this project is continuously running on fumes. There is some momentum, but it seems more sporadic than planned. Sometimes a guy shows up with some competences we can use, and the process then gains speed for a bit, but then things slow down again. This project is not really running steadily. If we played a larger role in the project we would probably take some more responsibility; but that's not our role here.

Interestingly, when the perspective turned to UIC's with students, the perceived incentive structure and project management responsibility changed hands. Here the students became the mains drivers of process and thereby also project management. One of the possible reasons behind this seemed to be that the partner with the shortest horizon became the partner with the incentives to lead the process. For some students merely having access to a company to collaborate with is a success criterion. Our data suggests that students get more freedom to effectuate their projects than

researchers do, which is perhaps logical as there is seldom money involved in these collaborations and that the companies thereby have less resources committed to the success of these projects.

While company respondents did not seem to place as much emphasis on the project management assignment when the projects involved students, other types of problems emerged. Firstly, students had unrealistic expectations to when and what the company managers could and would answer by email. Secondly, there were examples of students communication abilities when calling on the phone or writing an email. Particularly the ability to appear professional, set up meetings, write emails correctly etc.; all minor details that may add up to a manager wanting to invest his/her valuable time without a secure pay-off. Thirdly, some student groups tended to be locked into their problem before the first meeting with the company. Other comments along these lines suggested that the commitment from the students was simply too poor and some respondents argued that in fact the supervisor is probably the best contact-person for the companies. It was suggested that the supervisor needed to be much more visible and more active, especially in the work with clarifying expectations.

The synthesis of the arguments made above raise questions such as whether some supervisors are incapable of working with companies. Perhaps some sort of screening for this might be required. Therefore the university needs to make sure that the supervisors are rewarded in terms of contact hours. Perhaps such contact hours may be reserved for company contact hours? Another important criticism relating to the output for the company was the flexibility of the project periods. Therefore, interesting questions raised by the respondents were: How can the contact and initiation phases be started earlier in the semester than is the case at the present? And what is the ability to adapt and make flexible the start and finish of the project from both sides of the relationship?

Lack of time and focus was not just problematic in relation to students. Some corporate respondents were frustrated with the lack of time and focus spent on ensuring that the interaction between the researchers and the company functioned properly and also on ensuring the momentum of the project. One, although a particularly critical one, respondent noted that:

> "There ought to be a lot more control of the work process from the university. Also, there needs to be a better project management and a lot more time spent on managing the details of the project. There have been too many sporadic decisions and a lot of randomness"

Several of the other corporate respondents did also make a note of the fact that getting a collaboration to work meant that inevitably both parties would have to make adjustments to their processes of interacting and collaborating. One such respondent acknowledged that it may as well be on the part of the corporate partners that adjustments need to be made:

> "Perhaps we are not clear enough on determining our goals and our milestones, but we are learning from this, and the way that the university works. In the beginning we were a bit insecure, but then we set up some milestones – also for them (the university). We had to be explicit that these success criteria also concerned them; otherwise we couldn't call it a success criterion; and that they were related to milestones and not the overall goal of the project"

There is an important distinction in the quote made above, namely that project management success and project success need not be identical. Therefore, when designing university-industry collaborations (UIC's) it is important to be explicit about the success criteria related to project goals and the success criteria related to project milestones. The section below discusses this assertion in greater detail.

Are there relations between project management success and project success?

Throughout the data collection we probed the interrelations between project management success and project success. During the process of the interviews, the respondents clearly articulated a positive and perceived significant influence of project management on the success of the UIC. Interestingly, when we analyse the data to uncover this relationship, we find that there is not direct link as generally perceived by the respondents. The only completed project which unanimously has been pronounced as a failure was a project where all four of the identified stages were found to be insufficiently addressed.

Therefore, in order to probe more deeply into the particularities of the successful project management and project we analysed the criteria that were identified as drivers of good (and bad) project management. One of these drivers was the agreement, and also the balancing, of the time allocated to the project. Time allocation was often perceived as a proxy for focus or importance to each partner. Respondents from all three partner groups studied, i.e. companies, researchers and students alike, reasoned that if one or more of the involved partners were too busy, i.e. had too little focus on the particular project, it potentially posed a problem for the project. For the case of the

companies this was often dictated by the business cycle or by the general competitiveness in the industry. For the sake of the universities it may often be the case that industrial partners tend to migrate towards working with a few very successful researchers, rather than disperse themselves across a larger portion of these. As such key researchers easily become overworked, but are at the same time enticed to take in new projects to enhance their career opportunities and to sustain their existing organization. In balancing out project focus, some respondents argued that UIC's should insist on budgets of co-financing hours because they indicate the balance in the focus of each of the respective organisations.

Also the organisation of the inter-organizational team and the intra-organizational team, in the form of team composition, is emphasized as an enabler of project success. Several respondents were discouraged by the lack of clear power structure in UIC's and clarity as to who decides on which route to take in times of disagreement. In the analysis of these aspects, the separation of project holder and project manager was put forth be several respondents. One of them argued:

> "There needs to be room for a coordinator that has just a little bit of an overview, and can give just that little bit extra to make the collaboration succeed. This person does not necessarily have to be a person that will sit and write academic papers afterwards. The coordinator and the researcher extracting the knowledge out of the project do not necessarily have to be the same person. There are a lot of assignments in driving forth a research project that do not necessarily result in new scientific knowledge. "

Another important aspect was found to be agreeing on rules and values, i.e. aligning expectations and identifying cultural differences. Aligning expectations is addressed in greater detail in the next section concerning the phases of the UIC, however, in connection with e.g. agreeing on the culture around preparation for meetings, this alignment is important from all partners. This is emphasized in the following quote:

> "Ok, so most of us are academics ourselves, and we know that researchers have this one aspect that you should not take from then, namely their ability to choose exactly what they want to spend their time on. In this way the alignment of expectations is more concerned with linking some themes. So we do not control the processes very harshly. We don't let the researchers interfere with how we run the company and therefore we don't interfere with how

they run their research either. There is a good dialogue and as such more often than not we reach results that are mutually interesting".

So in effect, companies and university staff need to establish a reciprocal understanding not just on an organizational level but also on the personal level, where openness to give and receive critique as well as the ability to quickly get in touch is highlighted in the study. The synthesis of this discussion is that aligning the level of input is as important as aligning the output-related expectations.

In some instances university researchers were simply found to be inferior at clarifying what precisely they offered to industry. However, some corporate respondents held the point that this could be their own responsibility and that it was a question of getting to know the rules of the UIC game before trying to win the World Series. One self-conscious corporate manager confirmed that:

> "There will always be some instances where you think 'Okay, we could've done that in a smarter way'. But it is often just as much our own fault, and not just because the university does things in a special manner. Of course, sometimes we would like the outputs to be a bit more specific: Results tend to be very abstract and oriented towards knowledge sharing. But at least this is our own expectation too"

Another company respondent expressed:

> "I think it's more a question of getting in touch with these companies that are present in the area. There are a lot of companies that don't have a clue of the potential there is in the university. Company A (anonymized) didn't have any particular knowledge of which advantages they could get out of cooperating with the university. When they did start it was also with another expectation, but in the end they were happy, and they continued to have student projects after the initial trial. After having done one project for them, they may have different expectations to the next groups, because they've been through the process once before. Predetermined project suggestions are a good thing for the companies".

As such, it may be sensible for companies to define a strategy for UIC's with milestones and learning curves; a kind of UIC driver's license, so to speak, and perhaps the universities should be handing out lessons. Further, in relation to the UIC learning curve, one respondent noted that:

> "It was probably the administrative and financial set-up that was the most frustrating in the beginning"

Lack of alignment and clarity were in some cases tracked to the problem of continuity on the behalf of university staffing, where the best staff are "stolen" off by a private sector which can afford to pay premium wages and offer other goods such as longer maternity and paternity leaves, salary for extra workloads, just to name a few. A final cause of misalignment was traced to a lack of flexibility in project periods from the university. While this was problematic for some companies, other companies acknowledged that it was primarily a question of being adequately prepared.

Being adequately prepared seemed to be a concept that went across several themes of these interviews. Previously we saw how preparation was a part of meeting culture and knowing the context of your counterpart. Preparation also found its way into the realm of the project management itself, where the use of project managers was associated readily with project management success. One respondent argued that:

> "When the companies have the project management then there are no problems. However, most often it is the university that holds the project management responsibility as a part of the funding".

Thus we pose: Could the companies be activated more generally to take the project management responsibility? There is in our data a perceived – and big – difference between instances where there has been a project manager connected to the project versus instances where the researcher him/herself has conducted the role of the project manager. It was hinted that the successful project manager was someone that somehow could – if not bend rules – then at least take the role of a good lobbyist that worked at affecting the progress of the project.

While project management success was not causally related to project success, there seems to be a clearer link between project management success and to ensuring effective use of resources in both companies and universities. Here the use of milestones become important elements in achieving success and it is this function that is most often seen as missing in UIC's. It does, however, become problematic when corporate managers think they can run research projects like lean-based production companies (someone please tell our politicians that this also goes for running universities and research organizations). Therefore, we need to beware of the fact that potential problems arise with regard to preparation, theorizing, and that methodological aspects such as documentation processes can be a hindrance to the momentum of the project, not to mention

bureaucratization effects of steering groups, committees etc. connected with funding, that can be unforeseen time consumers.

Is project management considered to be of equal importance across the various stages of a project?

Our data indicates that project management is mainly perceived important in relation to the process stage of the UIC's. However, there were more perceived unsuccessful collaborations in the initiation and termination phases of the projects studied, than in the process phase. Therefore, it is important that project management is viewed as an underlying value of the whole research project rather than merely an add-on tool for ensuring milestones in the process stage.

In the contact stage of a UIC, project management is not very important. Here the personal traits of the partners and their respective track records are more important. For example, personal drive is perceived as extremely important for the project to succeed. However, already in the initiation phase, project management becomes adamant. This is the stage at which most projects fail. Our data indicates that aligning expectations is an extremely important part of the success-formula. Here, one respondent from the corporate sector concluded that: "The formalities of initiating the projects could be much better", and the viewpoints from all three partner groups studied, asked for the use of regular review-meetings and milestone meetings, of course balancing out the risk of bureaucracy. In general, companies stressed that some kind of involvement in the project description phase would be nice. We synthesize from the anecdotes in the interviews that getting the project structured right, and quickly, is important.

In relation to the process stage of a UIC, the use of a stage gate-model or milestone approach, as it was also titled, was the most prominently mentioned aspect. We had expected some respondents, especially corporate respondents, to stress the use of milestones and series of success factors, but we were surprised at the strength of this argument. And as such, perhaps we will need to take care in our interpretations, as the wording of our interview guide; our applied semantics or even our appearance may have enticed some respondents to stress this perspective. Despite this insinuation of a lack of reliability of this focus, our data does undoubtedly stress that especially researchers need to be clearer on the goals of their projects, but beware not to lose sight of the process. For the success of a UIC "someone in the collaboration has to have a real goal with the project", exclaimed one respondent.

Finally, in relation to the termination stage of the project, evaluation was highlighted to be a continuous exercise, which should be encompassed in the planning of the project and thus also in the alignment of expectations. To some extent, the knowledge flow, which is traditionally taken care of by the handing over of a research report or a paper of some sort, was seen as being just one of the ways where researchers, students and companies create knowledge between one another both in the process stage and the termination phase. Also, a few respondents noted that there should be time set off for discussing implementation issues with the company during the termination phase if this was not a part of the researchers' or students' responsibilities during the course of the project.

Conclusion

This paper illustrates the merits of using project management for inter-organizational purposes and how project management is important not only in a process phase, but also in the initialization phase of a UIC and in the termination phase. Our analyses indicate that project management affects value creation in each stage of the research project and not just in the process stage. From a theoretical stance, our data contributes to understanding the importance of reciprocity and aligning incentives in research collaborations. Future research should aim at theorizing this output in greater detail to create more normative models of UIC management practices, like for example the work being done on theories of New Research Management.

Project management is not merely a necessary add-on in the process stage of a UIC. Rather, it is to be considered a part of the initiation, process and termination phases of a research project. Although not an active part of the contact phase, we encountered anecdotal evidence that researchers having a good brand for keeping agreements and delivering as promised were more prone to achieving contacts with the most interesting companies to collaborate with. In the initiation phase we found that alignment of expectations, roles, responsibilities and agreeing on an organizational culture was important. In the process stage we found the merits of a dedicated project manager to foster a positive relationship with a good project execution. In general, a good project execution was not necessarily seen as a creator of better results. Rather, it was viewed as a security for the effective use of funding and as a motivator to the whole partner team.

Our analysis indicates that caution should be taken in bringing in too tight a control regime on the process stage, as it e.g. was problematic when corporate managers thought they could run research

projects like lean-based production companies. Research needs some slack because of unforeseen problems, documentation, and methodological issues. There was no causal alignment between project management success and project success. As a matter of fact, a research project can well be a success despite the failure of project management in one or more stages of the project. However, our data reveals a link between project management success and to ensuring effective use of resources in both companies and universities.

Finally, this study sets out to speculate on how these notions of project management across the phases of a research project can help identify best practices – or at least archetypes of best practices. Our results indicate that educating companies to work with the university is a good idea; perhaps starting them off with a team of students, a small scale research project etc. There are also indications that universities ought to work with structuring student contributions and supervision exercises through e.g. Lab initiatives and Solution Hubs to better coordinate with companies.

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