University-Industry Collaboration in IS Research: 
An Investigation of Successful Collaboration Models

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Abstract

The topic of university-industry collaboration has been of particular importance to the Bled Conference for the past 25 years. Our motivation to study this topic was inspired by recent discussions on engaged scholarship and successful publication strategies in which we observed a difference in attitudes towards collaboration projects in different regions of the world. We were particularly interested in exploring drivers and barriers for engagement with industry partners from the point of view of IS academics. As a result, we embarked on a long-term research programme on the investigation of successful modes of collaboration. In this paper, we present the findings of the first qualitative in-depth phase, in which we interviewed nine experienced researchers in order to understand the phenomenon of university-industry collaboration in the context of different research backgrounds. The findings from the preliminary interviews show that researchers have very differing individual preferences regarding the ideal setup of such collaborative research projects. They also show that design research and case study are the most common research methods in such projects. While peer-reviewed conference papers and journal articles are the most popular forms of academic output, reports and sessions with managers are the prevalent output for industry partners. This work is a precursor to a larger survey, which will allow us to study correlations between characteristics of researcher/project type and success factors for such projects in different regions of the world.

Keywords: University-industry collaboration, collaborative work, practitioners, research programme, research funding
1 Introduction, Motivation and Research Question

It seems to be a worldwide trend that research is equivalent to publications and that the
only “real” measurement of research excellence is the number of journal publications in
the best (most cited) international journals (Straub, 2009). The authors of this paper per‐
ceive this as the absolute dominating metric in current research assessments exercises.
However, there is a growing concern that a total focus on journal publications may div‐
ert our attention from providing value to our key stakeholders: industry, students and society
(Davis et al., 2005). As a reaction to that, a number of researchers have proposed a “re‐
vival” of collaborative research, which is now increasingly referred to as "engaged scholar‐
ship” (Van der Ven, 2007).

The purpose of this paper is to contribute to the understanding of university-industry col‐
laboration within the discipline of information systems (IS). We propose to do that
through investigating the nature, role and value of current “best practice” collected from
real-life experiences of IS researchers. We especially focus on barriers and drivers and we
intend to address the question whether there is a conflict between the pursuit of providing
value to stakeholders (especially industry) and the demand for “playing the publication
game” by maximizing the number of articles in the highest ranked journals.

Bruneel et al. (2010) performed a study on the barriers to university-industry collabora‐
tion from the point of view of companies: They found that “[...] relatively few studies have
investigated the nature of the barriers and the factors that might mitigate them” (Bruneel
et al. 2010, p. 858). Our study, on the other hand, investigates attitudes and experiences of
IS researchers. We assume that the attitude of researchers towards research with industry
partners is largely determined by the prevailing research culture and dependent on per‐
sonal experiences that the individual researcher has gained from such projects. In order to
explore these assumptions we embarked on a long-term project aimed at obtaining em‐
pirical data on experiences and attitudes. The following sections report on the findings of
our preliminary study. In this phase we seek to identify different collaboration efforts be‐
tween IS academics and industry unearthing the barriers, drivers, and benefits (both for
academia and for industry).

Van de Ven and Johnson (2006, p. 802) point to rising concerns in the IS discipline stating
"that academic research has become less useful for solving practical problems and that the
gulf between theory and practice in the professions is widening”. They raise specific con‐
cerns e.g. that “findings from academic as well as consulting studies are not useful to prac‐
titioners and do not get implemented” and they claim that academics are not aware of the
relevant (i.e. practice-oriented) research questions. They conclude that, “as a result, or‐
ganizations are not learning fast enough to keep up with the changing times.” The key is‐
 sue is to address what they call, the “transfer problem”.

In our observation, the IS research community is divided over the question of whether the
collaboration with industry is something that IS researchers should embrace as a valuable
way of knowledge co-creation, or if it is a difficult and treacherous path because of its
many "distracting facets" that it should be avoided. If we want to provide value to our key stakeholders (industry, students and society at large) we need to become engaged scholars and we argue that there are forms of university-industry research collaboration that are highly rewarding for the researchers involved in it and that such research can lead to "value co-creation" (Sarker et al., 2012).

We believe that the prevailing relationship between academia and industry is an important aspect in the discussion around the nature and fundamental understanding of the IS discipline. Provided that the scientific community understands the concept of "relevance" to a large extent as "relevant to practitioners" it becomes clear that a researcher's attitude towards an engagement with industry is a defining characteristic of his or her research stance. This question is isolated from the question of how to communicate the research findings to practitioners. Academic outlets are not suited for this communication because they are relevant to academics and not to practitioners. This is emphasised by Straub and Ang (2008, p. v) who state: "Any academic journal written by researchers for researchers as the primary audience is simply not targeted for practitioners." In our study we thus included questions regarding suitable academic as well as practitioner outputs.

Our motivation for our long-term study on IS researchers' engagement with industry was further spurred by a number of discussion streams in recent IS journals and at IS conferences. Among these are the following academic discourses:

- The provocative opinion piece "Why the old world cannot publish?" (Lyytinen et al., 2007),
- the debate about the publication chances of design science articles in journal publications (Österle et al., 2011; Baskerville et al., 2011),
- the value from research funding that stakeholders and society as a whole are deriving (Davis et. al., 2005; Gibbons and Johnston, 1974; Hall et al., 2003),
- the stream about the concept of "Engaged Scholarship" which is meant to address the alleged gap between theory and practice ("knowledge production problem", Van de Ven and Johnson, 2006, p. 802),
- the Scholarship of Engagement, a movement reacting to the disconnect between academics and the public (Boyer, 1996; Pettigrew, 2001; Barker, 2004),
- the pros and cons of collaborative research endeavours such as interactive social science (Orme, 2000; Simmons and Walker, 2000; Caswill and Shove, 2000; Van Buuren and Edelenbos, 2004; Hardy and Williams, 2011) or Co-operative Inquiry (Heron and Reason, 2001).

We argue that university-industry collaboration can actually address all of the above thematic challenges. We believe that the attitude towards university-industry collaboration differs substantially depending on academic traditions and socio-economic settings. Find-
ings from collaboration projects with industry can help academics to write relevant (and at the same time rigorous) publications and to sustain a high quality of teaching. We also assume that research cultures that benefit alternative research approaches (Frank, 2006) and more specifically Design Science (Hevner et al., 2004) are more likely to actively seek out opportunities for university-industry collaboration.

In this paper we are addressing the following research questions:

**What are models or forms of successful university-industry collaboration within IS?**

In order to answer this, we address the following additional questions in this paper:

- What are the characteristics of successful collaboration projects between IS researchers?
- What are the barriers and drivers of these projects?
- What are the attitudes of IS researchers towards collaborative research with industry?

The remaining paper is structured as follows: In the next section, we review the literature which led to our research question and the interview guideline. We discuss drivers and barriers to engagement and introduce different forms and methods of collaboration. We then explain the research steps and the development of the survey instrument. The main section presents the findings from the preliminary study. We conclude with some thoughts on the current findings.

## 2 University-Industry Collaboration in the Literature

Before engaging in a study of university-industry collaboration it is necessary to define the term clearly. We define the term "university-industry collaboration" as a research activity that is performed by a group of people containing academics and practitioners. The research is carried out together (collaboratively) or as Heron and Reason (2001) put it as research "with" rather than "on" people. In doing so, academics and practitioners are co-constructing knowledge (Hardy and Williams, 2011). The practitioners in a company or government agency are engaged in the research process – they are not a mere study object. Accordingly, a study of the impact of a particular technology in an organisation common to behavioural studies would not qualify as research collaboration in our definition. We are investigating research projects that are carried out as a collaboration between researchers in universities and practitioners in companies or government agencies.

The engagement can occur at all stages, from the definition of the research question and the development of the research design, to the actual research work and the interpretation of the findings. Pettigrew points out that it is essential that the practitioners are involved early in the research process: “The action steps to resolve the old dichotomy of theory and practice were often portrayed with the minimalist request for management researchers to
engagement with practitioners through more accessible dissemination. But dissemination is too late if the wrong questions have been asked.” (Pettigrew, 2001, p. 67)

**Scholarship of Engagement.** The idea of collaboration between university and industry is not a new one. Boyer (1996) coined the term “Scholarship of Engagement” (also see Barker, 2004). While the current traditional measures of research are the number of journal publications, and to some extent the number of citations, there is a growing demand in industry and society for research metrics of benefits to key stakeholders, students, industry and society at large. Accordingly, the Research Assessment Exercise (RAE) in the UK is now talking about research having to be excellent in terms of “originality, significance and rigour”, and researchers will now also be evaluated on whether their research has had an impact on society and industry (www.hefce.ac.uk/research/ref/about/background).

**Engaged Scholarship.** Van de Ven took up the idea and published a book entitled “Engaged Scholarship” (Van de Ven, 2007). In his book he describes a research methodology for participatory research with stakeholders. The content is concerned with bridging the knowledge gap and engaging practitioners in parts of the research process, but it does not talk about industry collaboration as such (e.g. the necessary organisational framework for such projects).

**Real engagement through collaboration.** However, whilst Van de Ven acknowledges the engagement of practitioners to ensure a certain degree of relevance and practicability in the research he does not explicitly argue for collaboration with an industry partner over the period of a research project with a defined outcome. There are, however, successful forms of collaboration which have been described in the literature, e.g. Collaborative Basic Research (Schubert and Fisher, 2009) or Consortium Research (Österle and Otto, 2010). Such forms of direct collaboration can vary depending on

- **scope** (number of parties involved, project amount)
- **length** (time in months/years)
- **initiator** (research initiated by university or industry)
- **research object** (artefact, process, data/information, behaviour, attitudes)
- **research outcome** (software, technology component, method, report)

These influential issues are surveyed in our interview guideline. We argue that collaboration can address many of the mentioned problems by engaging the practitioner in the research process as also argued by proponents of field work such as Schein (1987) and Whyte (1984).

**Drivers for engagement: successful publications.** We believe that engagement with industry can lead to successful academic publications if well presented and carried out in a rigorous way (Baskerville et al., 2011; Straub and Ang, 2008). Research with industry, when using a
suitable research method, can be a very valuable basis for evidence-based research (e.g. data, measurements, observations, testing, validation). This perception is in accordance with statements from the provocative opinion piece “Why the old world cannot publish?” (Lyytinen et al., 2007) in which the authors acknowledge a strong industry engagement of European Ph.D. students but criticise their lack of rigour in their academic writing. They say: “Many times, Ph.D. theses are produced to address practical problems within industry; for example, innovative workflow designs or modeling methods.” (Lyytinen et al., 2007, p. 323) They further argue that these projects often end when the industry partner is satisfied with the research outcome, which is often a product, some software or a method without scientifically reporting the results in journal articles. We argue that collaborative research indeed can lead to high-quality articles if their research design is considerate of the rules of high-quality academic writing from the start – adding decisive activities such as collecting evidence data and monitoring the research process on a meta-level which might seem superfluous for the industry partner but is essential for high-quality research publications. There is a prevailing criticism that design research projects often fall short of the last phase, the validation of the artefact in actual practice (Hevner et al., 2004).

**Barriers to engagement.** Schubert and Fisher (2009) identify a number of factors that impede collaboration between practitioners and academics from both of their respective points of view. Among the barriers for industry they mention unclear relevance of research findings to industry (Kabins, 2011), lacking knowledge and interest in designing the research instruments (Amabile et al., 2001), lack of access to research results (academic journals not attractive for practitioners), different timescales, different expectations from the research outcomes as well as disagreement on intellectual property rights. For the academics they mention a belief that industry is not interested or willing to work with universities (Hall et al., 2003), the often too long timeframe in which academic research is conducted (Pettigrew, 2001) and tedious maintenance of relationships with industry partners over a long period of time (Amabile et al., 2001).

In their study on collaboration from the point of view of industry Bruneel et al. identified two different kinds of barriers: “(i) those related to differences in the orientations of industry and universities”, what they describe as “orientation-related barriers” and “(ii) barriers related to conflicts over IP, and dealing with university administration”, labelled “transaction-related barriers” (Bruneel et al., 2010, p. 858)."

**Types of industry collaboration.** Our search for classification schemes for university-industry collaboration remained largely unsuccessful. Perkman and Walsh (2009) performed an inductive study and identified four typical goals of collaboration from interviews with academics. The findings showed that companies had addressed the researchers with issues regarding (1) problem solving, (2) technology development, (3) ideas testing and (4) knowledge generation.
3 Research Steps and Survey

The following section describes the steps that we followed in order to develop our research instrument. In the first step we deployed an inductive, qualitative research approach in order to understand the factors surrounding successful collaboration with industry from the point of view of IS researchers. We developed a semi-structured interview guideline based on the themes identified from the literature. With this, we conducted nine interviews at major IS conferences in the years 2010 and 2011 of between half an hour and an hour in length with researchers who had carried out collaborative research projects. We recorded and partly transcribed the interviews.

In the interviews respondents were asked to indicate their level of agreement with the proposed statements grouped into thematic areas. The items were developed based on the literature on drivers and barriers to university-industry collaboration discussed above. The interviews were used to develop and validate an online questionnaire that will be used for further data collection. The questionnaire (which is planned to be very similar to the interview guideline) is described below. Some questions are simple selections from a list of items. Questions on opinions or attitude are phrased in statements and responses are measured on a five point Likert scale from “I fully agree” to “I fully disagree” (or “no response”).

The questionnaire has four main sections with the following content:

1. Demographic information
   - Position, role, size of group, academic age, country

2. Types of industry collaboration
   - Engagement in the past

3. One successful project
   - Demographics of the successful project
   - Initiating party
   - Motivation to start project
   - Research methods used
   - Publication output
   - Output for practitioners
   - Success factors

4. Project experience in general
   - Overhead
   - Satisfaction of industry partners
   - Drivers for engagement
   - Barriers to engagement
   - Problems/challenges encountered in the past
   - Experience with of Ph.D. students
   - Perceived trend towards more or less industry research

We collected demographic information to be able to see correlations between project characteristics and the outcome/attitude of the researcher. We also investigated the previous engagements of the interviewee to see the range of projects he or she had been engaged in.
The main section of the questionnaire explores the experiences with a “successful project”. We believe that the motivation/output for the practitioners largely defines the research design and thus the choice of the research method. We expected that we would find typical combinations of “research method used” and “output for practitioners”. We used the items of the classification scheme by Perkman and Walsh (2009) for our list of “primary motivation”. We also explored the reasons why this project was seen as successful (“success factors”). The “general experience” section explores the drivers and barriers for collaboration as discussed in our literature review above and the role of Ph.D. students (in response to the criticism voiced in Lyytinen et al., 2007).

The following matrix was used to classify research projects (cf. Figure 1). An important finding of our literature analysis was a lack of structure in the discussion of university-industry collaboration which we are aiming to overcome with this matrix.

**Figure 1:** Classification of University-Industry Research (parties and external funding)

In the academic literature some authors focus on the *funding aspect* (Hall et al., 2001, 2003; Cohen et al., 2002; D’Este, 2007), others on the *parties involved* in the project (Schubert and Fisher, 2009; Österle and Otto, 2010). We felt that a classification scheme for *parties involved* and *external funding sources* would be helpful. We decided to only include *external funding* (industry partner or government agency) although the University, in most cases, contributes to the overall cost either as “in kind contribution” (e.g. their already employed staff) or in the form of additional financial resources.

## 4 Findings from the preliminary study

The following section presents the findings from our preliminary study. The results are based on interviews with IS academics. The number of interviews is indicated behind the question (N).
All respondents are either the head of their research unit (8) or the head of their own research group (1). They are experienced researchers; the average number of years since their Ph.D. graduation is 20 years. The sample includes researchers from Europe and Asia, i.e. Finland (2), Germany (3), Switzerland (1), The Netherlands (1), Singapore (1) and Taiwan (1).

Our search for typical patterns in industry collaboration revealed typical combinations (cf. Figure 2). The form “n:m, government-funded” emerged as the top model (6). The respondents had been engaged in all funding forms of 1:1 projects (total of 10). The collaboration type “1:m, industry-funded” was mentioned three times. Two respondents had additionally been engaged in “n:m, co-funded”, “1:m, government-funded” and “1:m, co-funded”. None of the n:1 combinations was mentioned at all. Neither was the unlikely construct of “n:m, industry-funded”. This result is not surprising as it reflects the existing funding structures in academic research shown in Table 1.

The primary motivation to start the research project was “an interesting research question” (4). Two respondents were looking for additional funding of research staff and three were approached by the industry partner.

![Figure 2: Experiences: types of industry engagement](image-url)
The successful projects had an average of 1.6 universities and 3.8 industry partners. This suggests that most projects that are ranked as "successful" are run by only one university (6) but include more than one industry partner. The "industry consortium" seems to be a popular model (5); only three respondents selected a 1:1 relationship as their most successful project.

The funding sources varied according to the different forms of collaboration. 41% of the funding came from government sources, 36% from industry and 23% was paid by the University itself.

The dominant research approach was Design Research (6) followed by Case Study (4), Behaviouristic Research (3) and Action Research (2). One respondent applied Grounded Theory (1). Mere deductive analysis and experiments/simulations were not used.

The research approaches confirm that projects with industry partners are best suited to develop artefacts and evaluate them in practice (cf. Figure 3). The case study allows academics to transfer the qualitative results of the projects into an accessible form. Industry projects are also a source for empirical data, as the company/government agency can also be seen as a study object for behaviouristic research. As expected we also see the application of action research where the researcher is part of the research process and actively influences the outcome.
Peer reviewed conference publications (45%) were the most frequent academic output of projects with industry followed by peer-reviewed journal articles (23%). The high number of articles in the AIS senior scholar basket of eight (14%) demonstrates clearly that findings from industry projects can be used to produce high quality publications (cf. Figure 4). Where Ph.D. students were involved in the projects the senior researcher tried to make sure that there was a high synergy between the project outcomes and the findings of the Ph.D. thesis (15%).

The findings of the study already show that there is a wide spectrum of outputs that are relevant for the industry partner (cf. Figure 5). The most important outputs for practitioners were reports and complementary sessions in which the findings were presented to senior management.
The perceived value to the industry partners from collaborative projects varies substantially (cf. Figure 6). Most respondents felt that the partners received a value that was greater than what they had invested. In two cases, however, the respondents felt that the value was much less than expected. Both researchers said in the interview that such research projects carry the risk of failure and that in many cases the industry partner might pay for the development of an artefact that will never be successful on the market (respondent #5 and #6). However, the perceived satisfaction level is high with only one exception and companies are likely to engage in another industry project with this university group again.

Figure 5: Output for practitioners

Figure 6: Perceived value for industry partners

Figure 7 shows the most important drivers for academics to engage in industry collaborations. The most important one is "access to empirical data" followed by "get more academic staff for your group".
Figure 7: Most important drivers for academics

Other drivers that were mentioned are “the prestige that such projects give to the University”, that “findings are an important input for teaching” and “that such projects provide evaluation opportunities (to try artefacts in practice)”.

Figure 8: Most important barriers for academics

Figure 8 shows the most important barriers for academics. “Lack of recognition from colleagues/deans” scores as the number one barrier followed by “Acquisition cost of getting projects is too high or takes too long time and effort”. The respondents also see difficulties
in obtaining funding and several report on scepticism in industry towards academics. Opportunities in the environment, unfavourable reputation and lack of access are not seen as obstacles. Finally, the respondents did not feel at all that they lack neither the necessary practical knowledge nor the ability to speak the practitioners’ language. All in all, the findings show that there is no lack of personal ability to work with industry but that collaboration is rather impeded by environmental factors such as attitude of colleagues/practitioners and funding/acquisition costs.

Other barriers mentioned were: “Board of University is now careful about direct collaboration with industry due to the risk of researchers becoming consultants and not doing research”; “It is too time consuming”; “Too short time perspective from the company’s side. Companies want too concrete results.”; “University administration makes it difficult to run such projects (too expensive).”; “Overhead costs on industry projects too high”.

There is no agreement on a trend towards more or less research collaboration with industry. Four respondents perceive a trend towards less, three towards more collaboration. Two do not perceive a trend at all.

Which type of collaboration was the most successful for you? (N=9)

None of the above described types of collaboration came out as “the most successful type” (cf. Figure 9). Two researchers favoured n:m, co-funded, two others 1:1, industry funded. Four types were mentioned only once. The ninth respondent stated that only a mix of types could sustain a successful research group.

The top two answers reflect two different paradigms. The n:m approach will most likely lead to large, complex projects with a lot of exchange of ideas, possibly interdisciplinary groups and the need to openly discuss ideas and share thoughts.

The 1:1 approach, on the other hand, can be used for small, agile projects where confidential topics are researched or new innovations are developed that cannot be shared with competitors.
This was confirmed by the respondents. One said: "Because if you involve many companies then you have a problem because they are competing and thus reluctant to provide data." (respondent #3) Another one argued for consortium projects as the best form because researcher teams can achieve a higher efficiency and more interesting output with multiple partners. (respondent #7)

The researchers responded unanimously to the last question: They would all engage in an industry collaboration project again. In the following paragraphs we summarise selected statements from the respondents and discuss the findings.

The issue of time and data access. "Research collaboration takes a lot of time and the mutual understanding and trust increases over time. It is an investment that you have to make." (respondent #7) "Industry projects are labour-intensive for the senior researcher (the professor) because he has to lead and guide the project." (respondent #9) These remarks are in accordance with the observation made by Lyytinen et al. who argue: "[...] intense research-industry engagements sap time and energy away from publication and decreases Europeans’ motivation to publish in elite journals" (2007, p. 324). Their conclusion, however, is not shared by our respondents. Respondent #9 said: "I gained access to valuable empirical data and was able to write a high quality paper with it."

The building of trust. "There are path dependencies due to different expectations in different countries. You have to identify overlapping interests with your research partners and build up social capital over time." (respondent #9) Again, this assessment is reflected in the literature. Van de Ven and Johnson say: "Time is critical for building relationships of trust, candour, and learning among researchers and practitioners" (2006, p. 812).

Findings are used for teaching. “The project contributed substantially to our Master programme.” (respondent #7)

Relevance. "Research with industry partners gives us access to practical problems that we do not see from ‘outside the company.’" (respondent #7)

Reputation. "I think you only get an unfavourable reputation when you engage exclusively in research with industry partners. The portfolio has to be mixed. Universities are not meant to be consulting companies but joint projects with industry partners can lead to high quality findings and this is highly respected in our place." (respondent #8)

Trend. “With worries I perceive a trend to counting, weighing and measuring and an obligation to publish in A-journals. This could lead to a trend of less engagement with industry”. (respondent #6)

5 Conclusions

This paper examines key issues of collaboration between researchers in universities and industry partners. As Baskerville et al. (2011) argue, top journals only accept top publications. Top publications are usually characterized by contribution to theory and novel find-
ings which on the other hand are based on a (rigorous) analysis of data (evidence). With the right skill set of methods researchers can derive findings that are highly relevant (for academics and practice) as well as highly rigorous at the same time if they are based on real-world data and retraceable steps in the research process which even involved different interest groups.

A second implication of engaging in university-industry collaboration is that we might avoid the many articles/projects, where the researcher is using a convenience sample of students from his/her class, which are often problematic proxies for real users/managers. The motivation to reply to a survey will be different, but most of all, the background for assessing and passing judgement is likely to be very different due to age, specific job context and world experience.

Thirdly and most importantly, university-industry projects are much more likely to produce value to our key stakeholders (industry and students) than research carried out exclusively at the desk. In collaborative projects with practitioners in industry, value will almost automatically become centre stage. Value to students is also likely to be higher. We will argue and we do accept that some of our colleagues might disagree, that in most situations, the marginal value to students of learning about one more taxonomy and/or one more theoretical perspective is likely to be substantially less than working with real cases/data/persons, and in that way get (better) exposed to the environment in which the student is going to practice after graduation.

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