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Collaborative practices and the temporal space between science and business

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Introduction
Collaboration (or “samverken” – Swedish) between university and society is in Sweden seen as strong driver to innovation and economic growth. Innovation steaming from universities is regarded as being key to the nations long-term competitiveness on the global arena. Similar trends can be seen across most OECD countries with the emergence of innovation system theory (Lundvall 2010) and triple helix (Etzkowitz, 2008). Within this context most of the European universities have created technology transfer offices (TTO) connected to the university with the sole purpose to support the commercializing of science. The operations of TTOs have traditionally been focused on work associated with patents and licencing but also with assisting researchers in entrepreneurial ventures e.g. through providing seed funding. These three activities are also what constitutes the “spin-our funnel” (or the linear process of innovation) from universities, meaning that innovation that is based on academic researcher follows a set of predetermined steps (Clarysse et al. 2005). However, few ideas have been so intensely criticised as the linear process of innovation (see e.g. Van de ven 2008 or Faberberg et al. 2006). It has also been recognised for a quite some time that patents and licencing only contributes to about 7 to 14 % of all knowledge transferred from university to the rests of society (Cohen et al. 1998; Agrawal 2002). University knowledge is transferred to the surrounding society in many other ways, through what Perkman et al. (2013) calls “academic engagement”. Academic engagement is all the activities that researchers engage in outside there specific research praxis e.g. publications, conferences and meetings, contract research, informal conversations over organizational boarders, consulting and collaborative research, co-supervising PhD-students and industrial PhDs (Salter & Martin 2001; Jacobsson & Perez Vico 2010).

Swedish universities are mandated by law to commercialize their science at the same time, and unlike almost all of the European countries, a national regulation known as “the professors privilege” grants all rights of a scientific discovery to the researcher (Nilsson, Rickne & Bengtsson, 2010). It could be argued that this situation would make the idea of the traditional linear spinout funnel, based on the sequence “discover – patent (license) – spinout - exit”, less of an obvious strategy for Swedish TTOs. It induces them to apply alternative mechanisms to diffuse science to society and several of these mechanisms are based explicitly on stimulating various forms of university-industry interactions (see e.g. Jacobsson & Perez Vico, 2010). Nilsson et al. (2010) call this the ‘Grey zone’ because these additional mechanisms are “general facts” but, nevertheless, are disregarded since its effects are difficult to measure and relate to innovation and economic growth. It is also pointed out by Perkmann and Walsh (2007) that current research seems to lack deep descriptions and analyses of university-industry interactions, thus there seem to be room, and need, to explore this ‘grey zone’ that constitutes so much of universities impact on innovation, economic growth and society.
at large. This paper aims at exploring one of these alternative mechanisms for diffusing academic research to foster innovation within industry namely, *collaborations*. This paper also provides the body of literature on industry-academia with first of all an empirical illustration built on a longitudinal study on industry-academia interactions, something that seem to be very rare within the literature. Van de ven and the innovation journey (2008) is an influential and noticeable exception even though it does not discuss the same issues I have looked into. Using a practice approach to understand interaction (in my case collaboration) between industry and academy does not seem to be present in the current literature on both practices as well industry-academia interaction.

Many scholars before me have described both the practices involved in research as well as business. There has however, to my knowledge, never been anyone formulating an idea of how this two practice interact and work together *in this present setting*. By applying a practise approach to these collaborations following the reasoning from Schatzki (1996) as a guide in practice theory, Wegner (1999) and Nicoloni (2012) on communities of practice present study outlines a new, and unexplored, way to understand these collaborations.

### The collaborations

Over the course of around three years I have been involved in explorative longitudinal studies on about 25 collaboration projects between researchers and small and medium sized businesses. I followed these collaborations by interviewing the mangers of the SME and the responsible researcher in the project on a regular basis, my questions was focused on what was transpiring in the projects e.g. what were they doing connected to the project and what artefacts moved between the SME and the researcher. I also made a number of participating observations on meetings between the SME and researcher. I was introduced to these collaborations through a project that were part of the work conducted by a Swedish TTO, UU Innovation. UU Innovation is Uppsala University TTO and works extensively with different aspects of industry – academy interactions. In fact the organisations have two interconnected strategies, where one is to engage researcher and industry to work together and the other is the more traditional commercialisation process, “discover – patent (license) – spinout - exit” (Jonsson et. al. forthcoming).

The project I followed was based on a straightforward approach: facilitate the formation of collaboration projects between SMEs and researchers by providing smaller grants. The strategy of offering funding was to provide additional incentives for researchers and SMEs to find each other and to engage in collaboration projects. The project also had an outspoken aim to only focus on providing new collaboration with funding in an attempt to reach out to SMEs that had no previous interaction with a university.

The collaborations were very diverse; some short while others stretch over years, some have a lot of recourses at their disposal others that have few, some within the hard sciences others in history or literature. The collaborations also differed greatly in the practices involved; one of the collaborations involved the characterisation of one of the most lightweight materials known to man, Aeorgel. Another collaboration was an attempt to cultivate probiotics in fine cheeses. Yet another one was an attempt to develop story telling around a tourist attraction.

### Practice theory?

Practice as a theory does not adhere to a common unified and coherent picture instead
there a few prominent scholars that have adapted a ‘practice approach’. This creates a somewhat distorted picture of what practice theory entitles and also a need to sketch out how I will apply it in this paper. Schatzki (1996) distinguishes four main types of practice theorists: philosophers (such as Wittgenstein, Dreyfus, or Taylor), social theorists (Bourdieu, Giddens), cultural theorists (Foucault, Lyotard) and theorists of science and technology (Latour, Pickering). It is also possible to distinguish two ‘waves’ or generations of practice theorists. The first generation comprises very prominent scholars e.g. Bourdieu, Foucault and Giddens. They were the first formed a foundation for practice theory; the second generation e.g. Schatzki, Reckwith, Warde or Ortner is currently developing that foundation (Warde 2005). The interests in practice from these diverse scholars seem to coincide with an interest in the ‘everyday’ and the ‘life world’. (Reckwitz 2002)

For Schatzki, the main philosophic advocate on the subject, one of the most attractive aspects of practises is that they are neither individual nor holistic. Practice theory ‘solves’ the long debate on how the social imposes on the individual either through structure or agency. There is instead a recursive processes in where each agent perform a practice somewhat different but still within the same practice, so as to both perform the practice but also change it and in doing so create, maintain and change the social world. It is also important to highlight that when using practice as a way to understand the social world it is not the individual as such that is the study object, the individual agent is instead the carrier of a practice and that practices are shared with other agents. Schatzki (1996) distinguish between two types of practices, dispersed practices and integrative practise. Dispersed practice appears in many sectors of social life, examples being describing, following rules, explaining or imagining. ‘Integrative practices’ are ‘the more complex practices found in and constitutive of particular domains of social life’ (Warde 2005). A practice can only be said to be a practice, if it has the following properties:

• If we are to engage in any practice it needs to be an understanding of what that is, what to say and what to do. Action on it own does not have meaning, it needs a context or it would make little sense.
• We also need rules of a practice i.e. what is allowed within a practice? Rules could be imposed from above, explicit, (e.g. manuals etc.) but most of the times rules are developed through the practice itself, they are of a tacit nature. Rules then have a double meaning in that they one hand are written but on they other hand they are also unwritten. Rules are also sources of understanding as the inform us how to behave (reading the rules of how to do something is also learning/understanding of how to behave)
• There also needs be ‘teleoffective’ structures, Schatzki (1996) uses the term to describe how one needs to embrace ends, projects, tasks, purposes, beliefs, emotions and moods in order for there to be a practice. There needs to be engagement (Warde 2005)
• Some scholars within the practice paradigm also emphasis that the material or material infrastructures are a fourth crucial part of any practice. Orlikowski (2007) argues the need to recognise that all practices are always and everywhere sociomaterial. That means that not only the direct things we use within a practice (like using my computer to write this text) but also the material around me that enables me to perform the practice.
These four (three for some scholars e.g. Schatzki 1996) properties of a practice forms a nexus of sayings and doings and one cannot go without the other in order for there to be a practice. When Schatzki (1996) outlines what a practice is by claiming that it is a nexus of sayings and doings he gives no priority any of them. That implies that there is a very intimate connection with language and practice. According to most theorists language can however never fully capture the understanding of a practice but are nevertheless inseparable from the practice. Practice is thus always linguistically under-determined yet language actively enters practice and is part of it. (Nicolini 2011)

According to Wenger (1999) practices also tend cluster together. In his book Communities of practices he outlines the way in which practices creates and form communities, he does this in order to form a learning theory different from then established norms. Although his aim rather different then my own his arguments are very attractive in the way he discusses how practices through learning, meaning and identify forms communities in a social world. He describes three dimensions in which practices forms a community: 1, there is mutual engagement, or there is a shared teleoaffectivity (Schatzki 1996), with the people involved within the community. 2, there is a negation of a joint enterprise within the participants. 3, there is a development of a shared repertoire. In an earlier work Lave and Wenger (1991) defined these communities as “a set of relations among persons, activity, and the world, over time and in relation with other tangential and overlapping communities of practices. A community of practices is an intrinsic condition for the existence of knowledge, not least because it process the interpretive support necessary for making sense of its heritage. Thus, participating in the cultural practice in which any knowledge exists is an epistemological principle of learning”. These communities should however not be seen as something static, the practices that brings people together are always evolving and changing.

Collaborating practices
By highlighting certain aspects of practice theory I want to focus on the practices involved in the collaborations I have been following for some time now. I believe that by first of all using Wengers (1999) concept on the communities of practise and matching that Schatzki (1996) definition on a practice with it is possible to argue that within the collaborations I have been looking at there are two large communities.

First of all I have two groups of actors, companies and researchers. If we start with companies it would be safe to say that they are, in very wide sense, doing some kind of business practice. The practice of business is indeed a very broad term but I believe it is possible to classify it in accordance with the four properties of a practice and argue that they form a community of practices within society. The other group of actors, the researchers, are doing a different practice: they are doing the practice of science, which we all know can be extremely diverse, but can also be said to adhere to the four properties of a practice an also form a community. It is also so that these two communities are by definition separated, within each community there my be similar practices that actors are performing, there my be boundary objects that brings actors together, there might be brokers that move between each practice, there might even by boundary practices between the communities (Wegner 1999) but on a community level the practices of business and practices of science are not the same thing regardless of the renegotiation and boundary spanning activities. The collaborations I am looking at are thus between two main communities, that of business and that of research. So how then are collaborations taking place between these two practices? First of all, a practice
is not a practice without the understanding, the rules, the teleoffectivity and the material Schatzki (1996). If we take away one of them it seizes to be a practice, the agent(s) that were performing the practice would then stop what he or she is doing or start doing some other practice. It is even likely that it becomes nonsensical or even impossible to keep performing the practice if any of them are missing e.g. writing this text without understanding what I am doing makes no sense, failing to grasp the rules of how one writes also makes it impossible to keep writing, without the teleoffectivity I have no motivation towards my writing and lastly I need something to write with, writing in thin air produces nothing.

What I also want to address it the importance of langue used in a community, practice is intimately connected to language and a practice is saturated with its own discourse. Each community, or practice, has words and concepts that need to be understood, in varying a degree, by every member of the community or those members are not immersed within the practice. According to Wenger (1999) a community develops a shared repertoire, that is to say a repertoire not only of shared practices as such but also a shared use of terms and concepts which might be hard for other communities to fully understand.

An illustration
If collaboration is to take place between two practices then what occurs in one practice should provide something to the corresponding practice or one practice is performing work that only has bearing in that practice. There is also a need to be some type of exchange or only one practice would have gained something i.e. there is no collaboration. I also think that what is exchanged or transferred needs to change or enable the other practice. An example is perhaps needed in order for this to make sense. In order to illustrate my point I will describe an imaginary project that has components from most of collaborations I have been following, I will construct a “idealized case” so to best try and capture as many of the collaborations as possible.

In one of the projects I am looking at a company that are selling a test that enables a very sensitive detection of small molecules in human blood are working together with a researcher at Uppsala University. The parties are still involved with each other to this day but the project official ran between 2012-2013. The researcher is specialising in a small molecule (Fox-7) thought to have a strong correlation with insulin resistance and development of type 2 diabetes. The company and the researcher have been trying to devise a new type of test that can detect this molecule. The company have the resources and the expertise to produce a wide verity of test but lack the specific knowledge needed in order to produce one that targets Fox-7. If a test could be created then the company would be able to launch a new product on the market. The researcher on the other hand seeks to gain more knowledge on this molecule and a well function test allowing screening of lots of samples would provide just that. The two parties had never before worked together in a structured manner. Even though the project seemed clear-cut a substantial amount of negotiations were needed to establish the details of the work that was to be done and decide on a shared goal that both parties could accept. In this initial stage of the project UU innovation was very much involved as a type of mediator in order to help the company and researcher formulate a joint project plan. The researcher expressed concerns that there was not enough time or researcher ambition to be worth his time. The company on the other hand worried that the project might take to long
with the risk that a product might never even come out of the collaboration. As UU Innovation provided funding for the collaboration there was less concern on possible financial risk other than potential loss of man-hour’s that could be put to better use somewhere else.

It was noticeable that in the early meetings the researcher and the company seemed to have difficulty communicating, it was as if concepts and words used didn’t resonate with the person sitting across the table. After a few meetings the communication issue seem to resolve itself and with that both parties were able to agree on terms of the project. The researcher in the project once said that he needed to ‘speak in layman’s terms’ in order to work with an industry partner. The company expressed similar thoughts in that they needed to downplay their business interest and focus on highlighting any potential new research results when working with academia. From the outset of the collaboration it was decided that the company would provide the materials and knowledge needed to work with a similar product that they hoped could be modified in order to detected the wanted molecule. The researcher with his superior knowledge would perform tests in his lab that either confirmed or denied the presence of Fox-7 and relay that knowledge back to the company that would produce the test in their facilities. As work started it was noticeable that there were a lot of materials being sent by mail or courier back and forth from the researcher to the company and vice versa. This mostly included samples with serum, vials containing Fox-7, lab protocols or different test kits, the work process that developed over the year was the following: company sent the materials to the researcher needed to set up experiments using similar tests that they anticipated could be modified in order to detected the wanted molecule, the researcher performed the experiments in his lab and sent back protocols to the company that tried to modified their production facilities and produce a test that, with enough sensitivity, could detect Fox-7. There were also quite few emails sent when something needed to be clarified or questioned about the materials being sent. Over the course of the year this back and forth process continued with mostly successful experiments and after some time it became clear that a test for Fox-7 seemed probable. The company started to realize that with all likelihood they would have a new product to offer the market. The company then tried to explore any potential costumers for the test by sending out commercial through their marketing channels, however the interest seem to be low with only a few costumers requesting to purchase the test. Sales was not what the company expected but they manage to sell enough that it justified their involvement with the researcher. Still, this collaboration was largely successful for both parties; the company got a well functioning and sensitive test for Fox-7 that they launched to the market. The researcher, given the freedom to use the test, was able to publish two separate scientific articles in esteemed journals.

I believe it is clear that even though the researcher and the company are working together there interest in Fox-7 is rather different. The easiest way of demonstrating this interest is to go through the four properties of a practice for the researcher as well as the company.

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1 As the researcher is Swedish he actually said ‘Att tala med bönder på bönders vis’ which doesn’t truly translate to a similar English phrase or saying. I decided on ‘speak in layman’s terms’ as sufficient to explain the researchers point.
• The understanding': Both practices are trying to increase their understandings on Fox-7. The understandings that move between the two practices are what enable work and in a sense it is what creates either the business practices or the researcher practice. Without the recursive flow of ‘understandings’ there would be no practice of business or of science. Off course there would be other science practices that involve other types of understandings and the same would apply to business practices. Therefore it is the understandings that move between the practices that are of interest here.

• ‘The material’: A practice requires something material. In the example I highlight Fox-7 as the main material component but it could just as easily be the machines in the lab, the machines the company uses to produce the test for Fox-7. One could certainly make a very long list of the materials used in science or in business (especially as I am very broad in my description of both of these practices). However, once again I want to highlight the materials that flow between the practices e.g. samples with Nox-4 sent to the researcher is the most obvious. But in order for there to be an exchange of knowledge/understandings there also need to be an exchange of materials e.g. emails, documents, protocols sent from the researcher to the company and vice versa.

• ‘The teleoaffecitivity’: This I believe is more self explanatory as the engagement within each practice does not necessarily have to change. Regardless what is exchanged a science practice would still be pursuing a similar teleoaffecitivity and the same would stand for a business. It is only in the specific types of science or business practices that something is likely to change in teleoaffecitivity. With that said it is obvious that the exchange that takes place gives rise to varying type of engagement from the involved parties.

• ‘The rules’: Similarly as teleoaffecitivity the rules of doing either business or science as practice would probably not change depending on what flows between the practices. Regardless of what understandings or materials the rules need to stay the same or the practice becomes something other then research or business. However, what might change is how these practices are executed. They might not change in respect to the overall practice of science or business but they could change in the details e.g. altered protocols in the case of research or a shift focus on a new market segment in the case of business.

Infused within these two practices (as in all practices) I have briefly explained and also what seems to be crucial to the success of the collaboration I described is how the researcher and the company communicated and the language they used. It was only after both of them recognized that they needed to reframe how they used technical terms/business terms and concepts as to adjust what they were speaking to find a common ground to work on. They changed their way of addressing the issues involved with Fox-7 by stripping away or focusing on parts that they felt was relevant to their counterparts in order to be able to achieve their goals.

In this paper I focus on the idea of collaborations between practises and I will limit myself to not go into a more thorough description of the practices in the above example. There is a flow of materials that moves from the company (a business practice) to the
researcher (a science practice) simultaneously as information (or understanding) moves in the other direction. As they continue their collaboration this process becomes recursive with materials and understandings constantly moving between the practices. It is this process that enables work in both of the practices, but it is not the same practice that is made possible. With such a demarcation made the first thing to notice is that that even though the researcher and the company are collaborating there interest in Fox-7 is rather different. The company does try to help the researcher in developing the test but the company mostly want to have product that they can sell i.e. enabling a business practice. Similarly the researcher is helping the business create a new product but he is mostly focused on exploring Fox-7 (and publishing one might ad) i.e. enabling a science practice. The understandings and the materials that move between the two practices are what enable work and in a sense it is what creates either the business practices or the researcher practice (See figure 1). Without the recursive flow of understandings and/or materials there would be no practice of business or of science within this specific collaboration. Of course there would be other science practices that involve other types of understandings and materials and the same would apply to business practices.

![Figure 1. Illustration of the recursive flow between business and science practices through the temporal zone of collaboration. The smaller circles represent the variations of each practice in their respective community.](image)

**Conclusions**

What I have put forth is a theorisation of how collaboration between industry and academia takes place, but it is not the people who collaborate, it is the practices. The agents are merely the carrier of these practices. Such an approach brings forth what is required to perform work within a specific setting and that collaboration between these rather different practices is maintained.

What I also want to underline is the I believe that when materials and understandings flow back and forth from science to business it needs to be facilitated in order to move. There is something, a temporal space of sorts (see figure 1), which emerges between the communities. It is in that space that the actual collaborations are. This space facilitates that what is sent between the practices, without it there cannot be anything sent to or from the practices i.e. they stop collaborating and instead does something in their respective practice. E.g. When the company send materials to the researcher they don’t
send an outlined plan for how they will use a Fox-7 test, they don't send their instruments, they don’t include a market plan nor do they explain how business works. No, they filter what is sent, they only provide what they see has bearing for what they think the scientist needs and can use in order to work with Fox-7. Similarly the researcher don't explain all the intricate details that he deemed not be relevant when he has done experiments on Fox-7, he sends the companies what he think they need in order to produce and sell a Fox-7 test. This negotiation is constantly changing and renegotiated but as long as there is collaboration there is also a space in where materials and understanding can travel. This space does not seem to come about without work, the actors actively create it, and specifically it develops through their adjusted language.

References


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