The importance of re-defining space in building a science park for knowledge creation

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The challenges in transforming a tech-park into a science park, from the traditional transactional knowledge-transfer model into a more relational knowledge creation based model, is here be described using the metaphor of liminality. Furthermore, how can the concept of "Ba" and the knowledge creation process assist in understanding how to avoid the condition of liminality, being neither in the transactional knowledge-transfer model nor having incorporated the more relational knowledge creation based model. This case, based on Johanneberg Science Park, illustrate the difficulties in making this change in mind and suggest using the concept of Ba' in better understanding how to enable the development of the concept of a science park as a place for knowledge creation in managing the space as Ba'.

Keywords: Innovation, Collaboration, Space, Science Park

The science park as a space for knowledge creation

The concept of science parks, or *technopoles* as those "innovative millieus" were then named, has been around since 1950's (Castells and Hall 1994). The first science parks were established in Silicon Valley, California and "Route 128" in Boston. However, the literature and studies on science parks, describing and assessing science parks came later (Quintas et al 1992, Massachusetts, Castells and Hall 1994, Westhead 1997, Westhead and Storey 1995, Clark 2003). As a concept, science parks developed slightly differently in USA and Europe. In EU science parks has regained focus during the last decade, related to the development of the EU science policy, and is now more based on the idea that science parks enables closer collaboration between academia, business and governmental organisations, referred to as triple helix collaborations (Etzkowitz and Leydesdorff, 2000) that drives innovation based on knowledge creation (Hansson 2007). Rather than science parks being a place that rent out office space with access to common services such as reception, IT etc., the concept needs to include aspects that drive knowledge creation (Hansson 2007).

In creating and offering space for knowledge creation across organizational boundaries, the proximity is not enough. Interaction, collaboration that entails knowledge creation is crucial. Based on the concept of Ba' (Nonaka and Konno, 1998, Nonaka, Toyama and Konno 2000), where space and context is at the core, space can be seen as framework to understand how to design for knowledge creation. This paper is based on the case of the establishment of Johanneberg Science Park (JSP), illustrating the difficulties in not to end up in the liminal space, in between, in striving to become a science park where knowledge creation is in focus rather than a single focus on a building and facilities that gives the impression of being collaborative and open.

Based on the suggestion in shifting role of Science Parks, from a focus on technology transfer and incubation more towards knowledge creation, the organizing and managing the science parks needs to be different and include the idea of space as opening up for collaborative knowledge creation processes (Hansson, 2007). In developing Science Parks towards an enabler of knowledge creation, Hansson (2007) suggests the concept of knowledge creation as developed by Nonaka et al (Nonaka and Konno, 1998, Nonaka, Toyama and Konno 2000) to be useful. In their model of knowledge creation shared space, as "Ba", is an important factor. The meaning of space here can be seen as a shared space for emerging relationships, space as the unknown, and as the as the context that is enacted depending on the involved actors. Space, as "Ba", is essential for the process, that convert and translate knowledge in a spiral, where knowledge through interactions in "the Ba" is transformed form tacit to explicit and explicit to tacit.

However, the challenges in transforming the understanding of what such science park consists of and understanding the space in such context, can if not carefully managed result in into a condition of liminality (Czarniawska and Mazza 2003), that is a status where the old logic is left behind but without having been replaced by a new. A condition of liminiality, or as the phrasing it origins from in the (van Gennep 1909) and in the management literature (Trice and Beyer 1993 and Eriksson-Zetterquist 2002) *"les rites de passage",* is a condition that appears under transition, and in a transition that demands an active phase of unlearning or leaving an old logic before entering into a new. The concept of liminality, or as it is also sometimes called, rites of passage, includes three phases, namely the separation phase, the transition phase and the incorporation phase. The different phases can be of different significances and magnitudes depending on the passage. Two examplew to illustrate this. given by van Gennep and also brought forward by Czarniawska and Mazza (2003), is the ones of funerals and marriages. For funerals the separation phase is the most significant, while for marriages the incorporation phase is more prominent. The condition of liminality, and the transition phase can be seen as a phase with lack of identity and thorough understanding of logic and a high level of ambiguity. It is a phase where the actor has separated from the old

logic while not been incorporated into the new, a phase that can be painful and if not carefully managed extended and not as short as first intended.

By inquiring into a case of a science park having the ambition to become an arena for co-creation rather than co-operation, this paper aims to shed light on how to contribute to a deeper understanding of the barriers in designing and establishing such space for knowledge creation across organizational boundaries. As the case will show there is a risk of ending up in the liminal space between the traditional identity of a science park as a place for knowledge transfer, rather than a transformative arena of trans boundary knowledge creation. Suggested is to use the concept of "Ba" to understand the notion of space as a context for knowledge creation.

Method

The study is based on an explorative and qualitative (Denzin, 2000; Silverman, 2000) case study approach (Eisenhardt 1989; Yin 2014), based on action research methodology (Cunningham 1993) to gain a deeper insight and understanding, with the aim to contribute not only to theory, but also to practice in terms of deliberate involvement of the researcher. The researcher here is based on Chalmers University of technology and engage in a project related to the JSP. With the dual focus on both theory and practice, and the closeness of the researcher to the object of study, action research offer to gain understanding not only of specific events and activities, but also in the overall context and thereby gaining a deeper understanding of the subject, which is a strength of this methodology. However, in applying an action research approach it is also crucial that efforts are made in clarifying and resolving any biases in perception, pre-understandings and interpretation of the empirical material (Alvesson 1999). The empirical material and analyses has therefore been validated with an outsider researcher. Further, validation of the analysis has been carried out by means of reviews and discussions with respondents and participants, as well as in the community of researchers in order to achieve consistent interpretations.

Case studies include a number of various applicable methodologies that complement one another. In this study, a combination of participant observations (Atkinson 1994) and interviews (Kvale 1996) has been used. The collection of data has been through workshops designed as multi-stakeholder dialogues as well as observations (Atkinson 1994) as the main source of data, and complemented with individual semi-structured interviews (Fontana 2000, Kvale 1996), to achieve a deeper understanding of the underlying forces for collaboration. The observations have been both participatory and non-participatory. The non-participatory observations have been based on an ethnographic approach, where the observer makes a great effort to remain an outsider vis-à-vis the group and not intervene (Alvesson 1999).

During fall 2013 and during 2014 observations has been conducted during 33 hours of workshops and meetings. In addition, 7 interviews have been made with project leaders and stakeholders representing the JSP-partners. Interviews and notes from observations has been transcribed and analyzed. Content analysis was then performed on all transcriptions, where citations were divided into different labels and categories. Further the findings were discussed and reflected upon in a small group of researchers.

The case of Johanneberg Science Park (JSP)

In 2010 JSP, was initiated and set-up as a collaborative effort between Chalmers University of Technology and the City of Gothenburg. JSP has then gradually been established and defined as new companies entering into the collaboration and becoming partners. The science park started by planning and building its new premises, located at the campus of Chalmers University of Technology, and finding new partners that wanted to be part of the science park. In the beginning the science park was more seen as a technology park, offering office areas with close proximity to the university and the researchers and students there. However, the ambition is to become a modern science park, where the focus in on collaboration and knowledge creation between stakeholders and actors from industry, academia and governmental organizations. The idea of JSP is, as most science park, to bring science and industry closer together and to bring industry and private sector closer to the labs of science in terms of utilizing the knowledge from science. In the case of JSP the idea has been extended to also to be a test arena for specific projects.

The two new buildings consist of 8200 m^2 office area. In theses premises some partner organizations and Chalmers University of Technology will have large separate areas and floors for their own specific activities. In addition there will also be one floor with mixed companies and organizations. Here small as well as large companies can have a few office places that will enable an attendance and involvement in the science park. In this area the JSP management organization will also be located.

The knowledge areas JSP focuses and will build around are Energy, Built environment, and Material & Nanotechnology. In this way JSP will complement the other two science parks in the Gothenburg area. Lindholmen Science Park, which is more focused on transportation and ICT and Sahlgrenska Science Park that is closely linked to Life Sciences. As of today, May 2015, JSP has 11 partners that also are owners of the science park.

This case is based on some central parts of the development phase during 2013-2015 when most of the partners have been brought in and new premises built and planned for.

Space as more than buildings – or as the buildings to be filled with tenants

In the set up of JSP, the importance of the buildings, the premises, has been a key aspect in the strategic discussions. However, as stated by the CEO of JSP, Mats Bergh,

> "A science park is not about the buildings and putting up the signs. However, the buildings represents an important first milestone and the buildings are often prerequisites that enables collaboration, which in turn enable the trans-boundary innovative environment our science park aim to become".[1]

Furthermore, one of the managers leading one of the Chalmers activities that will move into the new premises also stressed the importance of the building design and interior with regards to collaboration;

> "It is important with the building layout and interior design, that it will inspire, be inviting to creative discussion and to instigate collaboration. We don't have that kind of collaborative-areas elsewhere and it is important for us when instigating deeper forms of collaboration with industry. I just assume it has been taken into account when designing the building."

However, as the project with the buildings started, the plans were to be drawn up on what actors to attract to the science park. After the initial phase the building layout and interior was not only what was brought up in meetings and interviews. The JSP management team was doing everything they could to attract partner and tenants to the science park buildings. As one of the main owners and stakeholder, Chalmers University of Technology also started the work on to find relevant companies that would be suitable to become partners to the science park and as a project leader points out:

> "We have developed a clear view of which sectors we wanted to attract and have focus on in the new JSP. It is very important to find the right partners and tenants, so we don't end up with two beautiful but empty houses."

And other person involved brought forward another aspect of "filling the houses";

> "We now have one large organization that want to move into and fill one full floor in one of the buildings. It is great to have a tenant and partner that will take such large share. Nevertheless, one could question if that is the purpose of the science park to have large organizations to move in their whole organizations and not only smaller parts of research and development related parts."

[1] http://www.johannebergsciencepark.com/sv/vart-omrade-utvecklas-1

The challenge of creating the space

As the space got rented out and less space left, some people started to reflect on the buildings, partners, and the aim of the science park and how it was to be created.

> "The new science park buildings seem to be very nice, with a lot of space for meetings and meeting people. However, I have not yet seen any strategic plans, ideas or activities on how to create and instigate collaborations. I think it will be more difficult that one think. Just look at Lindholmen Science Park, most companies there are large multinational companies that have part of its research and development departments located there. But how much of the activities there are in collaboration with others, and with more/different collaboration than it would have been elsewhere? I don't know, but that is my personal reflection after being working there for a long time. " (project manager 2)

> "Before building the new premises, we have had a lot of presence form industry and small start-ups on campus. However, if that means collaboration and cooperation, I though wonder. It seems more like it is a status to have development activities in close proximity to a university, but how much collaboration it has generated in reality, I wonder. Maybe it will be different with the new premises, but I don't know." (project manager 4)

> "Some of us have been a bit concerned with regards to the strategy of inviting and selecting the activities to fill the science park with. It is one thing if an established company move in with parts of its research department that it wants to collaborate more in its research with other, but having a larger company moving in and using a whole floor and with all its activities, including administrative departments. Isn't the whole idea about having smaller teams/groups on the space that will interact and collaborate extensively with others? Or just to have a common cafeteria and breakfast seminars?" (project manager 3)

Even though there are critical voices, at the same time there are also expectations:

> "We will be involved in a lot of common activities I think. Just the latest half year there has been a busy agenda on seminars and workshops that JSP has organized and invites to, on a variety of subjects. However, it is very often that those represent the voice of a certain organization or company, and become more of a presentation, than a higher level of discussion that would open up for interaction and later collaboration."

And as another representative put it;

> "We are already now seeing an impressive agenda of different kind of events and seminars. It is from breakfast seminars to start-up events. We are really looking forward to move into the new JSP and sees many opportunities with that. As a company we already have some collaborations with Chalmers researchers, but we would like to be closer and have more collaborations, also with other established companies as well as start-ups. And then of course being closer to the students."

In asking the project leaders, partners and involved persons in the strategic planning, what would enhance knowledge creation in JSP, the following was brought forward:

> "I have understood that there will be some experimental projects that will take place in the area, that we can either be a part of or at least do activities related to. Energy on campus is one and the Living Lab is another. "

> "Related to the JSP there will be pilot activities and experimental projects such as the electrical bus, the residential are connected to the Climate KIC, and others. I think those pilots and projects can be the glue that makes different actors starts to collaborate more. It is not enough that we work in the same building, and eat in the same lunch restaurant. We need something to gather and collaborate around."

Those last commented on activities that will be organized in close proximity to the science park and with stakeholders also from outside the science park.

Discussion

From the interviews and observations the partners and tenants express high expectations of collaboration to take place. However, few representatives express what type of collaboration they want and expect to take place and how they are thinking about their own space they are renting. Much of the collaboration seems to be expected in the common space. At the same time, the study does not reveal the deeper understanding of what knowledge creation actually is expected to be and how experienced the different actors are in collaborating across organizational boundaries? What do they put into the word collaboration? What we understand is that not all representatives are convinced that the different organizations that will move in, has high developed skills in knowledge creation, at least not all parts of the organizations.

The concern and work of the management is very much focusing on the buildings and facilities. Even if the management team of the science park has

been able to articulate the strategic intent and direction of the JSP, to a science park where the space is a collaborative arena, for knowledge creation, the strong focus on renting out office space speaks a different language.

The concept of liminality (Czarniawska and Mazza 2003) can here shed light on the challenges a transformation like the one JSP aspire to go through. In their action the JSP management can be seen as in a vacuum, in phase where they still do not know what their new strategic view actually is. It then becomes crucial for the management team to understand how to take the necessary steps to incorporate the new logic of becoming an arena for knowledge creation, in order to otherwise risking entering into a condition of liminality.

In becoming a science park that is a space and context for trans boundary collaboration and knowledge creation, as "Ba" is the context for the knowledge creation described as the SECI-process (Nonaka and Konno, 1998, Nonaka, Toyama and Konno 2000) strong transformative skills will be demanded of the JSP management team. They not only needs to understand what a context for knowledge creation is and how it is created, it further needs to understand how to make the organisations and stakeholders of the JSP involved to incorporate such understanding and how to engage in cross organizational knowledge creation. This in itself can be seen as a process of developing and converting explicit- and tacit knowledge in a spiral, to come to a developed understanding of what the space of the science parka as a context for knowledge creation can be.

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