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Citation for the published paper:

Nilsson, F. (2013) "Architectural Laborations. Setting up research as strategic tools in architectural practice". *Knowing (by) Designing* pp. 754-763.

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Architectural laborations

Setting up research as strategic tools in architectural practice

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Challenges in contemporary society and built environment are in many ways connected to ongoing technological developments, changing socio-cultural conditions and need for sustainable development. The complexities in architectural commissions are increasing and there is a growing need to integrate different fields of knowledge and perspectives in more conscious and elaborated ways. Other approaches and methods must be used to grasp, understand and get knowledge of the complex situations as well as to manage the processes and create strong solutions materialized in built works. There are demanding challenges and difficulties, but there are also great opportunities for design thinking and architectural practice to support the developments. The interest for research and development of new knowledge within architectural practices has grown enormously during the last years, and the knowledge produced in creative practice has started to become acknowledged also in academia.

This paper will from the background of the developments above, as one case from the ongoing changes in architectural practice, present some of the research initiatives at the Swedish office White arkitekter, the largest architectural firm in Scandinavia, established in 1951 and in which the author has worked since 2000. The firm has a long tradition of working with issues of research and development, but during the last years there have been intensified efforts to develop more coordinated research and collaborations and to also integrate it closer into everyday work and creative practice.

The paper describes the background, elaborates on notions of research used within the firm, and presents efforts to set up a distributed research laboratory environment including practice-based doctoral projects working part-time in architectural projects. The intention of the paper is to show how research activities could be connected closer to architectural design projects, and by that also meet the contemporary challenges using design thinking as well as the specific knowledge generated in the practice of the field. It is based on studies of published work as well as on observations, conversations, interviews, and own experiences from the architectural practice.

Context: Research and architectural practice

Research in architectural practice got in focus of the international debate in the 1990s (Lootsma 1999; Nieuwenhuis & Ouwerkerk 2000), and several architects and offices presented their work as research using methods that appeared as systematic investigations of the contemporary world (Koolhaas 1995; Maas et al. 1998; Bunschoten et al. 2001; FOA et al. 2003). Architecture was not only devoted to objects, but also described as “an organon, a means to gain knowledge, a system of inquiry, innovation and technique” (Kwintar 1998), but the importance of exploring the specific knowledge of architecture was also emphasized (Arets & Zaera-Polo 2003).

In the Scandinavian countries there has in the last few years been an almost paradigmatic change in architectural offices' interest for research. From having been a divide between research and practice, and from the perspective of the profession almost

disqualifying to have a research degree, we now see a rapid increase in new research collaborations between companies and universities as well as between different professions in the building sector. A seminar on “Practice-based architectural research”, arranged by Swedish Association of Architects in 2011, was fully booked with over hundred registered participants from the whole sector and with several architectural offices not previously engaged in research (Sällström 2011). Some Swedish architectural offices, like Sweco and Abako, have conducted research and collaborated with universities since many years, but a broader interest has become obvious. Also in Denmark the increased interest towards research is clear, and several Danish offices use this more actively in their communication and marketing. 3xN started their R&D department in 2007 with focus on new materials and technologies (Juul 2008), and have made publications communicating a research attitude (3xN 2007; 3xN 2010). Schmidt Hammer Lassen has supported industrial PhD projects, on e.g. experimental methods for concrete casting (Manelius 2012), and Henning Larsen Architects support PhD research on integrated energy design.

Even if research in many ways has become a way to brand architectural offices, there are internationally several practices grounded in serious research efforts. KieranTimberlake is such an office and their practice has been “designed to support research, engendering a deeply rooted culture of inquiry” (Wallick et al. 2011). Perkins+Will started their own research journal dedicated to presenting practice-related research with the aim “to capture and document research questions and methodologies that arise prior, during and after the design process” (Aksamija & Kuttaiah 2009).

It has suddenly become attractive to have close collaborations with researchers and even to have people with research competence and doctoral degrees employed in architectural practices. Research is used as a strategic tool to develop architectural design as well as a way to attract both employees and clients. The need to also develop, communicate and share knowledge in new ways is obvious, and design thinking has become crucial from several perspectives.

Case: Research and development at White arkitekter

As one case in relation to the discussions above, I will here present some work at White arkitekter, an architectural firm established by Sidney White and Per-Axel Ekholm in 1951 in Göteborg, Sweden. The firm is employee-owned with today nine offices in Sweden, three in Denmark, and project offices in London and Oslo.

White has since many years actively worked with research activities and development of knowledge. In late 1970s White established a research foundation with the aim to support scientific research on architecture, urban planning, building planning and projecting, and some of the firm’s profits have been deposited to the foundation through the years. The foundation is open for the whole sector, and supports R&D-projects within White as well as by other architects, researchers and universities.

In the 1980s internal networks on central areas like housing and healthcare were established, during the 90s they grew and several more formed, and a lot of activities and publications were made. What was slowly emerging as a R&D-department in the 80s worked primarily with seminars, study visits and shorter internal courses related to the field of architecture. In 1989 White employed Claes Caldenby, architectural critic, researcher and subsequently professor of Architectural Theory and History at Chalmers, and the activities were more systematic. A lot of efforts were not least put into environmental issues, leading to publications like “‘The Little Green’. Handbook for a Healthy and Ecofriendly Construction”, which formed an important base for the work on sustainability (Caldenby 1996). An environmental unit in the firm was started in 1997, consisting of architects and engineers with various expertises, and has formed an important vehicle for developing solutions for sustainable architecture.

The research foundation has supported a great variety of studies. The work on environmental and sustainability issues has continued, and an early study on active solar energy in buildings and city neighborhoods (Lundgren & Wallin 2003) has recently earned renewed attention. Among the examples are studies of White's own office in Stockholm from the perspective of building technology (Mattsson 2005) as well as on the project process collaboration of many actors (Kadefors 2003). Science parks and laboratories have been analyzed (Alexanderson et al. 2002; Alexanderson et al. 2007); models for strategic planning of schools have been developed (Kristensson 2007); and recently, the city planning process in relation to New Karolinska Hospital has been studied (Swanson 2012). Different approaches and methods are used in the research projects, relating to different academic traditions and kinds of knowledge.

In relation to the firm's fiftieth anniversary a series of activities, like workshops, project reviews, seminars were arranged, but also documentation of projects, interviews, historical reflections, and writing of articles. It culminated in September 2001 with the launch of the book "Just White. Handbook for the Architecture of the Future" at the Gothenburg Book Fair. The objective was to rethink the legacy of the firm, to initiate debate, and to engage in contemporary societal issues (Grillner et al. 2001). This can be seen as part of larger efforts to document and analyze the history, tradition and culture of the firm, where research projects have studied developments and influential architects (Caldenby 2000; Borglund 2003; Björkman et al. 2009).

Reflections over the firm's history have been central, both to transfer its culture and also develop it further from certain values and ideals. This relates to Nonaka's reasoning that "the knowledge-creating company is as much about ideals as it is about ideas. And that fact fuels innovation". The essence of innovation is to re-create the world according to a particular vision or ideal. Production of new knowledge is not about processing objective information, but depends on "tapping the tacit and often highly subjective insights, intuitions, and hunches of individual employees and making those insights available for testing and use by the company as a whole. The key to this process is personal commitment, the employees' sense of identity with the enterprise and its mission" (Nonaka 2008, pp.6–8). Awareness of the culture, history and ideals of the firm is something crucial and could actually trigger innovation and new thinking.

Crucial points: Structuring knowledge development

In the years following 2001, the importance of constantly developing new knowledge was highlighted at White, and the R&D work was structured more consciously. Two central goals were formulated: first, constantly develop new knowledge to offer greatest possible value to clients and users; and second, make use of, connect and promote all knowledge, skills and wealth of ideas possessed by all employees. In such a big company, much knowledge and expertise about certain issues are already there, and the crucial thing is to connect the right people, form the right teams. At the center are the knowledge networks, and the R&D-department has developed into a network-based, distributed department through the whole firm rather than becoming a separate unit. The department has its own budget, but the people involved are primarily architects and engineers employed at the different offices and active in architectural projects.

The knowledge networks are branched over all of White, and the network activities, open for all employees, consist of e.g. network meetings in which people are connected, projects reviewed, and new questions and issues formulated. Of great importance are also the external activities in seminars and symposia, where knowledge is transferred, questions encircled, problems formulated together with other actors (clients, users, politicians, contractors, etc.) as a way to be at the cutting edge and secure relevance.

In 2008 initiatives were taken to strengthen and give more structure to all research and development activities, and the first R&D Program was formulated in 2009. In the

program it is stated that conscious strategies for production and management of knowledge are needed to meet contemporary challenges and contribute to sustainable development, but also to offer more values to clients, users, and collaborating partners through clear knowledge strategies. “Knowledge is thus an increasingly important resource and an increasingly stronger competitive factor”. The R&D program consists of strategic areas “to focus in the development of one of our most important assets – namely our collective knowledge” (White 2009, p.3).

A more elaborated view of the notion of research at White was also formulated in the R&D program. Knowledge in architecture, urbanism, landscape and design include a broad range with different actors and stakeholders involved. Research is therefore needed on various levels of scales and with different foci. Also different approaches and methodologies, from traditional scientific to emerging modes in practice and collaborations, have to be engaged and utilized. It is stated that collaboration with universities as well as actors in the building sector is desirable and needed, since contemporary and future challenges and research issues are complex and need collaboration between many disciplines, stakeholders and actors.

At seminars within White, notions and concepts in relation to research have been discussed, also relating to current developments in academic discussions on concepts like transdisciplinarity and research-by-design. Points of departure in these discussions have been established definitions of research and how they relate to or could be elaborated in connection to creative design practice.

One of the definitions, from the Swedish National Encyclopedia, describes research as a “process that through systematic work can produce new and increased knowledge” (Nationalencyklopedin n.d.). This gives a quite open definition of what research can be, but central is the importance of a “systematic work” of some kind. Another definition is the often referred one by OECD: “Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications” (OECD 2002, p.30). Here the systematic aspect of research is again underlined, but also that it is a “creative work”. The question has been how the creative work in academic practice relates to creative work in professional practice, and how the design aspects could be more integrated into the already ongoing research projects and efforts at White.

This has been discussed in relation to emerging notions on practice-related and practice-based research, like research-by-design and transdisciplinary research (See e.g. Dunin-Woyseth & Nielsen 2004; Doucet & Janssens 2011; Hensel 2012). This has clarified that the different research activities and collaborations going on for many years at White, have great connections to and similarities with transdisciplinary efforts now being initiated internationally. The growing awareness of notions and methodologies of research as well as of the specificity of architectural and design knowledge, has led to interest in connecting the research efforts to the designerly work in more conscious ways.

Current initiatives: Practice-based research and knowledge production

During the last decade, the developments in digital design tools have exploded and several efforts been launched at White to catch up with the front-line of advancement. In 2010, the unit Dsearch was started, as an environment for digital design development within White, directed by Jonas Runberger. Parallel to setting up Dsearch, Runberger worked on his PhD *Architectural Prototypes* and he included several projects from White in his research (Runberger 2012). The work by Dsearch as well as the conceptual and methodological framework in the dissertation has triggered

developments at White towards more exploratory research with digital and material modeling close to the architectural projects.

In 2012 an experimental effort called “White Research Lab” was initiated with internal funding. The explicit intentions were to gain: more R&D close to commissions and experimental research-by-design; more strategic collaborations with external actors; long term development of internal research competence; and to have better communication and integration of R&D-projects and their results. Through a very simple and fast application process, over twenty-five projects started during 2012, and with great interest from both the employees and office managements. One of the projects is the development of a green plant façade system for Nordic climate in collaboration with NCC, and the construction, plant species, and design are currently being tested in prototypes on the roof of White’s Stockholm office.

The “White Research Lab” initiative also included more funding to industrial PhDs, and three part-time doctoral projects are currently being conducted in collaboration with Chalmers University of Technology in Gothenburg and Royal Institute of Technology in Stockholm. One as a continuation of studies of the prize-winning psychiatric clinic at Östra Hospital by White, where an anthology on the importance of architecture in medical treatment led to a research project for the architect Stefan Lundin (From & Lundin 2010); another on the theme of “Energy as Design Parameter. Tectonics and morphology for zero-energy architecture” by the architect and environmental expert Marja Lundgren; and a third on “Mixed Cities” by the architect Erik Linn.

Collaboration with researchers from different disciplines has been important at White, and the firm has for instance also engaged in research on the specificity of knowledge in architectural design work and how that kind of knowledge is managed. Based on this, Alexander Styhre writes that the work of architects “shares a basic morphology with scientific work: architects’ work is conducted in the intersection between the symbolic and the material; it is based on the ability to talk and communicate both within and outside the firm; the main influence for new thinking is derived from the outside the focal site; and, finally, architectural work is propelled by the distribution of peer recognition and credibility on the basis of individual and collective performances” (Styhre 2009, p.103). He also stresses that architectural work is a social practice based on individual and collective contributions as well as shared efforts to make sense out of a variety of activities.

Styhre emphasizes that architects’ knowledge is distributed over a variety of resources and assets, and he describes the knowledge-intensive work of the community of architects as a form of aesthetic work embedded in perceptual capacities and in the ability to communicate meaning verbally and symbolically. This work is always emerging in networks of integrated and inter-related resources, skills and activities, and knowledge management in architecture is “essentially embodied and anchored in the perceptual capacities of the practising architect” (Styhre 2009, p.120).

Concluding: Research and innovation by dynamic networks and transfer of culture

Research has more and more become a strategic tool in architectural practice. At White, research has more consciously been used to produce needed knowledge, but also to develop architectural design as well as the firm itself. A work culture based in knowledge networks as well as reflections on the firm’s history is in line with the theories on innovation and knowledge sharing by Nonaka and Styhre. Last years’ more conscious integrations of research and practice can be seen as ways of how research with designerly and experimental approaches can develop contemporary architectural practice to meet current and future challenges in built environments and architecture.

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