RESEARCH AND DESIGN PRACTICE – AN EXPLORATORY UPDATE OF DONALD SCHÖN

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ABSTRACT

The Reflective Practitioner and *Educating the Reflective Practitioner,* the two most influential books by Donald Schön from 1983 and 1987, have so far been regarded as a self-evident platform for design research. The ideas put forward have been much discussed but not basically questioned. However, during the last years the conditions for design practice has changed fundamentally. To find out if the understanding of Schön can be developed to match the new situation or if other approaches are necessary, a new critical discussion is necessary. This paper is a first and explorative attempt to identify important issues for such an examination. It takes its point of departure in two of Schön´s basic concepts, *reflection-in-action* and *repertoire* and makes use of two actual philosophers, *Cornelius Castoriadis* and *Elisabeth Grosz*, to find a new theoretical base for development of his understanding.

THE DEVELOPMENT OF DESIGN RESEARCH

Design research has from the start been closely related to professional design practice. However, the point of departure has differed from internal ambitions to develop the specific qualities of design-based work to external demands for adaption of the design processes to new conditions.

The first generation of design researchers were deeply involved in the radical modernization after the Second World War. They were inspired by operation analysis and other science-based techniques to get from specified goals to optimal solutions more smoothly and securely (Churchman 1971, Cross 1977). This “Design Methods Movement” tried to combine a straightforward, evidence-based technical rationality with the art-based skills of designers.

The new and more formalized approaches were however met by scepticism in practice. And when the new tools were actually used, the results were questioned. Studies showed that people became more focused on timelines than on looking for innovative solutions. Broader social perspectives were also left aside. The critique coincided with some doubts even among original enthusiasts for formalized methods (Ackoff 1979).

New approaches that promoted more open-ended processes were asked for. Focus in the research work moved from methods and control to an interest for the designers´ creative way of working. Still, the ambition was to find processes that could be transparent and methodologically re-producible and by that possible to educate about.

However, it was found difficult to identify and articulate the basic qualities. Even when the conditions seemed to be very similar, the single design processes were organized and carried through in different ways. When asked about their approaches and methods, the designers

also had difficulties to answer in a comprehensive way. The conclusion was that experience-based adaption to the specific design situation is of a more crucial importance for what happens than a consistent following of certain rules and procedures. It was also obvious that other people involved in design processes, both experts and users, mostly play a more decisive role than just as informers. The focus moved once again from the individual designer to the design process as a whole (Jones, Thornley 1963, Lawson 1980, 2005, Cross 2001, Laurel 2003, Nelson, Stolterman 2003, Krippendorff 2006).

At the same time studies in other fields showed that technical rationality was not a self-evident basis even for lawyers, physicians and other more prototypical professions. These practices were also largely based on well-tried experience and did not follow any given procedures. The approaches differed to fit the actual situations and problems. Scientific results were used but in a much more unorthodox way than expected.

However, the request for more controlled professional work processes and for evidence-based considerations and conclusions was still predominant in important parts of society. This resulted in a stronger emphasis on the scientific content at the expense of professional training in the higher education programs. The art-based design education was also questioned.

This contradiction between publicly prescribed and real forms of working resulted in a lot of confusion, not at least at the schools. The "scientification" of education was after a while also questioned by local managers. These critics meant that it takes too much time before engineers and other experts are able to solve practical problems at hand without guidance.

SIMON AND SCHÖN

To cope with this contradiction it was necessary to actualize a more basic discussion about perception, understanding and creative work. Design research turned into a philosophical interest, inspired by thinkers as Ludwig Wittgenstein. It became obvious that different ways of handling complexity is a key question.

Most design processes are characterized by a large number of different variables that never can be fully acknowledged so that all connections can be identified. It is necessary to reduce the number of considered interdependencies even at the risk of dangerous simplifications. In science this dilemma is mostly faced by the assumption that there is a hidden and simple order to be found.

Herbert Simon with his background in the social sciences and mathematics said that in nature, "complexity, correctly viewed, is only a mask for simplicity". It is possible to "find patterns hidden in apparent chaos" (Simon 1969).

But in difference to other scientists he noticed that something happens when human beings enter the scene with their values and purposes and create artefacts by design. The mechanisms are of another kind and must be studied in other ways. He developed an understanding where the artefacts can be regarded as a meeting-point, an "interface", between an "inner" environment, that corresponds to the purpose, "the substance and organization of the artefact itself" and an "outer" environment, the use and the context of the use.

A complementary science, a "Science of the Artificial", that handles phenomena of "what should be" is necessary that cannot be subordinated the logic of the natural sciences.

Still, he did not accept a less systematic and controlled process and knowledge within this new science. He meant that the creation of appropriate artefacts basically is a question of articulating the functions properly in accordance with the means available and to be clear about the values. However, he understood that, in practice, this kind of processes cannot be fully controlled and result in optimal solutions. The solutions can only be more or less "satisfactory". A judgment based on critical thinking is necessary to come to a decision.

This new approach had a large impact on theory and practice within management. Designers saw it more as a confirmation of the understanding of design as a unique kind of process. It was also a strong argument for development of design research as a discipline of its own.

Donald Schön had a background as pragmatic philosopher and had worked as a management consultant for a long time. During that work he had observed processes of change and the conflicts between the different perspectives for a long time. His ambition was primarily to show and upgrade the importance of the practical skill of professionals.

In difference to Simon, his basic assumptions were not much articulated. As other pragmatic philosophers he avoided thinking that could be regarded as metaphysical and did not show much interest for development of general understandings. He worked in a designerly way, focused on specific problematic situations and was looking for possible improvements. The developed understanding and the concepts he presented are close to the ones expressed and used in the actual practices. However, the conclusions were also well based on actual research in different fields.

Schön´s way of writing is characterized by reasoning rather than by to the point analytics (Schön 1983, 1985, 1987). Other researchers have criticized the easiness by which he handles complex issues and have asked for a more clear account of his results.

Still, compared with other design researchers, he has had an enormous influence. His basic concepts are referred to in some way or other in most publications about the basic understanding of design. He has obviously succeeded in both coming close to how

design practice is experienced by people involved and to draw attention to crucial and earlier neglected parts of the process.

REFLECTION-IN-ACTION

However, is his analysis and are his concepts still as valid as they have been? Are they able to take care of and give advice in relation to actual problems? What need is there for complements? In the coming sections I will present an exploratory analysis based on his main concept, reflection-in-action (Schön 1983, 1985, 1987). It is important to notice that this analysis does not try to cover the whole of the work of Donald Schön. The aim is primarily to relate his approaches to some actual problems and the ongoing changes of design practice.

The metaphor behind the concept of reflection is a mirror and the idea is that a look from outside may reveal features that differ from the expected. However, human beings tend to try to look for confirmation rather than for revisions. As the feministic researcher Donna Harraway says: "Reflexivity has been much recommended as a critical practice, but my suspicion is that reflexivity, like reflection, only displaces the same elsewhere, setting up the worries about copy and original and the search for the authentic and really real" (Harraway 1997).

This kind of risk for reinforcement of predominant perspectives is also actualized when Deleuze discusses dialectics (Deleuze 1991). He means that the antithesis is conceptually bound to the thesis. To change viewpoint, something different and unfamiliar has to be introduced.

Schön did not say much about the initiation of the reflective activity and about the possibilities to get a critical distance. He showed the use of metaphors in his cases but did not develop their ability and restrictions more generally. He also showed that an active use of the complexity of the design situation itself could be useful to open up the mind. By looking for incongruence and deviations from the expected, other viewpoints often appear. Reductions and simplifications can also be made more conscious which can result in new creative turns in the process. The complexity can be kept alive. He described that as "conversations with the situation". However, he kept this critical inquiry quite close to the concrete problems and did not show the fruitfulness of a wider perspective on the context.

He also showed that the effects of this way of using the design situation to avoid deadlocks can be even stronger if the dynamics is set in play as in action research. Kurt Lewin discovered that it is easier to find the decisive and critical characteristics of a situation if there is a possibility to make experimental interventions (Lewin 1946). These interventions in a design process can range from role-plays to more radical provocations.

REPERTOIRES

However, even if it is possible to get rid of a number of prejudices and find a more multi-dimensional way of understanding the design situation by different kinds of reflection, the origin of the new and innovative ideas is still a fundamental mystery. From where and how do new ideas appear? Schön talked in quite general terms about repertoires of "cumulatively developed knowledge" to which the actual design situation is related. But he did not say much about how such a repertoire is acquired, structured and used. He regarded an inquiry into that as an "intriguing and promising topic for the future".

A repertoire may contain many kinds of referential material all the way from complete examples to single elements of knowledge. However, to work properly early in the design process the content must be possible to scan in a very direct and intuitive way. This means that the number and structure of entries must be manageable and that an advanced tool for matching is available.

As architect I use a tool-set that I call "formats". Formats of this kind are prototypical models that are structurally given but also possible to adapt in scale and proportions to a specific situation without loosing their basic characteristics. They could be described as resilient. The kind of elasticity they offer can vary depending on the whole set of formats in the repertoire. There are both macro- and microformats. These formats must not be mixed up with the kind of pattern language that Christoffer Alexander developed (Alexander 1964). The formats do not constitute a general language. They are pragmatically created and used by the designer.

The basic quality of a format is a conceptual clearness and an ability to be generic. A elementary example is the basilica that has a distinct structure but, to a limit, can appear in different size and different proportions without loosing its identity. Many formats are collective property among architects and are discussed e.g. in context with critique. Some of them may even be global. The architectural press plays an important role for the generation of new formats.

The practice of using formats is the kind of pattern matching that has been studied within neurophysiologic research during the last decades (Damasio 2003). It has for example been shown that reoccurring coherences often result in more or less permanent connections in the brain.

This matching process is intuitive and almost immediate and results in a starting-point that often works surprisingly. However, after a while, when it has been exposed to the many detailed demands and restrictions and adapted according to them, the specific topological rules tend to be overruled and it has to be abandoned and replaced by another more accurate one. By each loop in this process the designer learns more about the

design situation and is able to handle an increased number of demands and restrictions at the same time.

At last the architect has so much knowledge about the actual situation that she/he is able try alternative formats or combinations of formats in a very quick and effective way. Sometimes this results in quite radical changes very late in the process that can be frustrating for the decision-makers as they, at that stage, often ask for stability.

THE ROLE OF AESTHETICS

The holistic character of the set of entries in the repertoire has also, in my understanding, a close connection to aesthetics. Schön did not say much principally about aesthetics in design. One reason could be that he, like John Dewey, primarily related the concept to Fine Arts and by that did not find it so important for the design context (Dewey 1934).

However, the Fine Arts perspective is not self-evident. When going back to the introduction of the concept by Alexander Baumgarten in 1735, aesthetics is not just an internal concept for the Fine Arts but represents a different kind of knowledge.

He talked about a "Science of Sensuous Cognition". This knowledge is not characterized by distinct statements but by "extensive clearness" and appears intuitively and immediately. It cannot be conceptualized like ordinary scientific knowledge. He used examples from Poetry to illustrate his reasoning and meant that if a poem is deconstructed and analyzed it will loose all its power. It can only be fully experienced by the senses. However, he did not restrict the use of the concept to the artistic field.

In difference to Baumgarten, Immanuel Kant took art as the point of departure for his understanding of aesthetics. In his book "Critique of Judgment" published in 1790 (Kant 1952) he connected aesthetics to his observation that the experiences of art are autonomous and independent of ethics and practical considerations.

However, even if this perspective has become very dominant, the more inclusive perspective on aesthetics has been re-actualized several times. One example is Ludwig Wittgenstein who, in one of his lectures, stated that: "Ethics and Aesthetics are one" (Wittgenstein 1969). He seems to have meant that artistic means is the only way to fully express the complexity of ethical considerations. To illustrate his view he compared the great and lasting impact of the novels of Tolstoy with the temporary effects of the many articles on social and political issues he also wrote.

Lately, the earlier understandings of aesthetics have become more or less obsolete even within the Fine Arts by new art forms. A wider and more generally applicable perspective, less connected to traditional expressions of beauty, is necessary to support the actual discourses. I mean that aesthetics now should be reconsidered along the lines of a meaningful, surprising, expressive and comprehensive experience in general.

Such reconsideration would make aesthetics an important perspective in all kinds of design, not just the artistically oriented. It would be a question of how ethical aspects, complexity and contradictions can be expressed and communicated. Aesthetics may by that become a new platform for evaluation that complements the analysis of single qualities and problems by approaching the values of the whole.

This way of using the concept of aesthetics may also make it easier to understand how formats and other tools used in the repertoires of designers work. The designer's ability to keep the clearness even when the early proposals are confronted with a lot of diverse and even conflicting demands becomes an important part of the skill.

DESIGNERS IN CONTEXT

Schön focused his work on the individual designer. He did not discuss other participants and the need for different kinds of collaboration more than indirectly. This restriction has been criticised many times during the last decades. A wider perspective is obviously necessary even when concentrating on the skills of the designer.

The basic change is that standardized an long-term solutions in design have become exceptions. There is a continuous request for adaption to new situations even after the realizati. The boundary between products and services has also more or less disappeared. At the same time the technologies have become more advanced and integrated so that many more specialists have to take part. A design process is not just a one-off. It has to go on in parallel with the use of the products, systems and environments.

This means that users do not any longer just take part in the design processes out of a right to influence one's own daily life. Direct access to their experiences and values during the whole design process is necessary to secure the result.

This means that many more people with different backgrounds and with their own pre-understanding of the design situation take active part in the design work (Krippendorff 2006). By that, the professional role of the designer does not just involve production of virtual futures but also an advanced coordination of complex social processes.

One of the most important parts of that process is to make all the different perspectives alive for the participants. This is as complex as the design situation itself even if the aim is different. Still, it can make use of basically the same skill. It is a question of finding a conceptual whole by trial-and-error and prototypical models where all perspectives become related and the contradictions and dilemmas appear. To make the

differences more clear, provocative compilations can also be productive.

The ambition of the traditional designer to quickly come up with innovative solution must also be played down. Too concrete solutions at a too early stage can be dangerous. It may result in lock-ups where people feel forced to be for or against rather than to join in an effort to come to reasonable compromises.

A STEP BACKWARDS TO MORE BASIC ASSUMPTIONS

It is obvious that the role of the designer has changed fundamentally. Still, it seems as if the traditional skill, so well described by Schön, could be the professional basis even in the new situation. Does this mean that a more comprehensive understanding of our existence, and society, that I earlier asked for, is not that necessary to get to a deeper understanding? Is design a neutral skill basically independent of political and social conditions?

It is no doubt that Schön was politically interested and active. He was eager to reach out and influence and well aware of the resistance his ideas were met by and how it could be handled. Still, he avoided all wider political and social implications.

Whatever the reason was for this avoidance, I mean that a further development of Schön's understanding of design cannot be carried through without a more general understanding of social change. Pragmatic philosophy is a useful base, but leaves, out of its avoidance of deeper articulations, too many questions unanswered.

There are numerous examples of attempts to create a solid philosophical ground for design. I will not go into any of these attempts now. By presenting the standpoints of two philosophers, Cornelius Castoriadis and Elisabeth Grosz, I hope to inspire the discussion in a more designerly direction.

Cornelius Castoriadis had a very mixed background, starting as a Marxist activist and later on rejecting Marxist theory and working as an economist within OECD for 20 years. He lived in Paris and was also involved in psychoanalysis.

The most relevant of his ideas in this context are the ones about society and change (Castoriadis 1997). He means that, "being is not a system, not even a system of systems". Nothing is determined. What occurs around us and frames what happens in our lives is fundamentally accidental. Society does not exist in an essential meaning. It is a "form" resulting from the historical creation of partial institutions in the broadest understanding as norms, language procedures and organizations. Some institutions are closed and strong, others open and informal.

Still, man exists only in and through this far from finished form. Notions as the individual, does not have any meaning outside a society. The understanding of concepts as for example "reality" can only be given inside a society. Biology and physics are just conditions for life. What happens in for example the brain is a result of life, not life itself, that takes place in society. Society changes, mostly slowly, but keeps some basic qualities even when it goes through major crises. The institutions are sub-forms that create a web of different meanings that he call the "magma of social imaginary significations". Those meanings are not consistent with each other. They appear as sub streams in a flow that is impossible to characterize as a whole. All meanings are creations out of the actual institutional circumstances and do not correspond to any "rational" or "real" elements.

Consequently, each society follows its own dynamics even if there are many resemblances between different cultures, mostly based on concrete exchange. Some of the changes are possible to predict but the risk to presume too much of a logic or a continuity is always there. Significations are neither "distinct" nor "definite" and refer to each other in very specific ways. New forms at a societal level are mostly a result of long historical processes where the shifts of paradigms are not recognized before some crucial steps are taken. The importance of single events or personal interventions is often overestimated.

This does not mean that individuals or groups are unable to come up with ideas that can be developed into new sub-forms, e.g. institutions, physical artefacts and laws and in the long run even "re-instituting" society. Each individual has autonomy by its "closure". This autonomy has in the course of history developed from immediate and pre-programmed responses to outside threats into an ability to imagine new possibilities and make inquiries to realize them.

Elisabeth Grosz, who has a background in French philosophy and feministic theory, goes deeper into these questions about change and future in an explorative article about the openness of the future and the possibilities of real innovations (Grosz 1999).

Her understanding of our existence as something both given and unpredictable seems to be close to that of Castoriadis. She talks about "becoming" quoting Giles Deleuze (Deleuze 1983,1991). She means that we have to accept that the changes going on in both nature and society are emergent. They are both compelling and indeterminable and we cannot rely on trends to set out our future. To get a realistic start for design and innovation we have to look for deviations rather than for continuity.

All the same we cannot know anything for sure. All our understandings, even the historical, are virtual in the meaning that they are significations created under specific conditions and imprinted by that. They have to be judged out of the circumstances during the creation and the purposes; pronounced or underlying. And these constructions are not only dependent of time but also of space. They are situated in both aspects.

However, this basic insecurity does not mean that reality outside us cannot be approached. Even if there are a lot of different changes going on all the time there is always an "actual" reality (following Bergson). that we can refer to and conclude if a proposed change is possible or not. But even if the proposal is appropriate and realistic at the moment there are no guarantees for the future. The conclusion of this is that design cannot just focus on the artefacts but must prepare the users and stakeholders for a continuous reconsideration and redesign.

At the same time all design processes do not just change the future but also the present. The social imaginary significations develop. People involved in other changes have to regard it as a new part of reality. The production of virtual realities can at the societal level be regarded as a kind of exuberant reality.

It is important to note that both the creation of the virtual realities and the actualization are creative processes but in different ways. Normally, the virtual is dominated by a conceptual whole and coherent, while the actualization is a question of adapting without loosing too much of the conceptual whole.

CONCLUSIONS

What can be said about design research out of this attempt to critically examine, actualize and complement the ideas of Donald Schön? Design is obviously a very complex phenomena that cannot be understood by one theoretical approach. Like design situations it is necessary to keep a lot of different perspectives alive. It is also difficult to come up with recommendations of how to proceed in practice, as the power of design is the adaption to the local and specific. No situation is like the other and it is not only single moves and the order of the moves that differ. The whole approach is open.

The possible generalizations must by that stay at a comprehensive theoretical level. That calls for case-study methodology with or without experimental and other interventions (Yin 1984). The difficulty is to choose the situations to look into, as the resources are limited. Researchers using this method are expected to articulate their pre-understandings, to pay attention to unexpected data and to successively re-formulate their pre-understanding. Case studies never result in knowledge that can be used directly in other situations. It is a question of theoretical generalization.

What about the demand for rigor in this kind of studies that go deep into specific situations and even make interventions? The general answer is of course a thorough documentation that notes all differences between moments and cases. The difficulty is to be open enough to note the deviations from what was expected and not just get the pre-understanding confirmed.

The only way to secure this kind of watchfulness is to be related to other researchers with the same kind of interest and have to present and defend the position taken. Many schools of design are small and do not offer a critical mass within research. Exchanges with other institutions and new institutions in-between the existing ones that can host seminars and workshops are necessary. NORDES is a good example of such an institution.

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