

Designers and researchers: a study of the collaborative process

Clément Gault, Orange Labs, clement.gault@gmail.com

Anne-France Kogan, Ecole des Mines de Nantes, France

Abstract

The paper is focused on the process concerning collaborative work between designers and researchers. The goal is to highlight key elements regarding this topic. Although the respective activities of the designer and the scientist are different, the exhibition *Design and the Elastic Mind* highlighted the close proximity enjoyed by both parties today. Be it through the range of proposals, the knowledge gained or the knowledge sparked, design combined with the latest scientific developments seems to bring new perspectives to both disciplines. But how does this effectively translate in each discipline? In this paper, we will explore the question through an analysis of semi-structured interviews. These conversations were held between July and September 2009 with 7 designers and 7 researchers that had worked together.

Keywords

Industrial design; collaboration; designer; researcher; interview; design practice; study;

In February 2008 the New York MoMA hosted the exhibition *Design and the Elastic Mind*. With more than 200 projects presented, the purpose of the exhibition was to highlight “one of the most fundamental roles of design: the translation of scientific and technological revolutions into accessible objects that change people’s lives”¹. In that sense, the projects were very close to Nigel Cross’s “scientific design” (Cross, 2007) where the goal is to imagine objects based on the latest scientific developments. As Raymond Willem states, here design makes “science visible” (Willem, 1990).

Although the respective activities of the designer and the scientist are different, the exhibition highlighted the close proximity enjoyed by both parties today. Be it through the range of proposals, the knowledge gained or the knowledge sparked, design combined with the latest scientific developments seems to bring new perspectives to both disciplines.

But how does this effectively translate in each discipline? In this article, we will explore the question through an analysis of semi-structured interviews. These conversations were held between July and September 2009 with 7 designers and 7 researchers that had worked together.

Although they share identical values such as innovation, creation of new products and knowledge, design and research follow different paths. As Armand Hatchuel, a professor at the Ecole des Mines in Paris, reminds us, a designer has to “imagine a previously unknown object that will seduce and surprise, whilst being immediately recognizable.” The researcher, on the other hand, has the freedom to surprise with unknown objects that he can explain and argue on the basis of new scientific developments he has used (Hatchuel, 2006). It is necessary to remind the reader that the gap is even more important in France, where research in design is not part of any curriculum: there is no design MBA or PHD. In reference to Christopher Frayling’s classification, this lack of formal design curriculum means the researcher *on the subject of design* takes

¹ Glenn Lowry in the introduction of the book about the exhibition

precedence over the researcher *in design* (Frayling, 1993). This is why in France, the relationship between designer and researcher is a meeting of practice rather than practitioners.

The literature we read before our interviews led us to try and analyze the importance of mediation resources, or tools, in the relationship between design and research. Be it drawings, sketches, models or 3-dimensional representations, numerous researches have been done to understand their importance in a shared thought process. During the ethnographic analysis of a simple technical product's conception, Eric Blanco, a researcher in mechanics, studied in particular the role of a scribbled sketch (Blanco, 1999). The researcher argues that these scribbles describe the process and its temporality at the same time. They are both the translation and the mediation. The researcher also points out the limits of drafts: they are part of the concept phase because they lack formal codification, and they cannot reconstitute the meaning of the project. They have to be distinguished from "closed" objects that are formally coded in a descriptive manner. That is why drafts are usually part of the industrial process.

In a similar manner, the sociologist Dominique Vinck studied the role of graphics in the collaborative process between different crafts (Vinck and Laureillard 1999). Strengthening Eric Blanco's analysis, he completes it by stating that prescription roles between protagonists are sustained by the various ways in which graphics are produced and shared.

However, it proved difficult to study the numerous elements in the available literature, and in particular the sharing of tools. Most of the transcripts report fieldwork relevant in the context of an ethnographic analysis, and are difficult to pinpoint in the context of semi open question interviews. Nonetheless, we found that shared activities between researchers and designers could be narrowed down to how they shared their tools in a reciprocal manner.

To start with, an industrial designer with a lengthy experience of working with scientists described the relationship in these words: "the scientist isn't a customer (...) he doesn't need to be seduced. It would be pointless to show him a finished product". The designer uses a different approach, "showing them previous finished products. So that they can see where it can all lead, to what degree of sophistication the project can go".

On the subject of drawings, drafts, and design research, he explains his strategy. For him, it is necessary to "show that the project is still extremely fragile and open (...) undetermined, open to transformation, so that the other person can find his place and own the drawing or pre-model."

The designer has understood that no cooperation can exist if he presents a "closed object" to the researcher, because it implies a prescription relationship from the designer to the researcher. On the contrary, presenting an "open and fragile" object gives a "grip", a word coined by Dominique Vinck. As in mountaineering, a grip stems from the object itself, and from the action it provokes. As the designer reminded us, we are not in a seduction mode. Neither are we in a demonstrative mode, but in an explanatory mode. The designer presents his formal research to the scientist so that he can convince him, not seduce him.

The interviews have also led us to observe quite the opposite: the scientist realizes that their mediation resources are shared. A researcher in agricultural science reported that he literally manipulated chemicals in an experimental way while collaborating with a team of designers. The aim was a learning experience: the designer wanted to fully understand the process of discovering new agricultural products. Later on he made an interesting observation. He noted that the designer drawings echoed the scientist's "experimentations". He highlighted the path leading to a presentable end-product, a path of proof and explanation instead of seduction.

The scientist insists that the designer involved in shared research has to verify his ideas can be translated into products, just like him. Insisting on the thought process, "the designer will pen down his idea, and we (the scientists) will test his idea in our test tubes and labs".

The symbiotic relationship between mediation resources proves that the link between designer and scientist is not a one-way street. Another researcher, a computer science graduate, related his experience with designers. While conducting a research in a cross-cutting lab with computer

scientists, architects and designers, he realized his research work should “inspire, inform and support the designer’s thought process, and refrain from taking over his work”.

From there, he “realized it was necessary to use the same tools as the designers in order to communicate in an effective manner with them”. He concluded that his aim should be to use the same mediation tools, so that there would be enough “grips” in the Vinck sense, for them to work together effectively. Finally, he pinpointed a paradox in his own use of designers’ mediation tools: “as the process goes along, the more he feels he is seen as a designer”. The fact that he is using certain tools and processes close to the design world lead people to think he is a designer.

In our study, the interaction and close relationship between research and design expresses itself clearly through the use of common tools. Their reciprocal roles weld into each other, as one adopts the communication methods of the other. The seductive aspect of the designers’ tools seems to become more demonstrative and scientific, whilst at the same time the scientists’ tools evolve towards the seductive.

The final researcher interviewed stated he used the scenario to work with designers. He named the mediation tools “intermediate representation”, an expression we have found elsewhere in our readings. Eric Blanco writes about “an intermediate object” to qualify the objects that represent “the intentions and know-how of their authors and at the same time the product-to-be.” (Blanco, 1999).

The fact that designers and scientists are generally close is not new. In part this is why we have chosen to analyze the shared tools, and not their respective practices.

Annie Gentès, researcher at Telecom Paris Tech, explains that the conceptual thought process of designers and engineers/researchers is very close because both use a “creative mediation” process (Gentès, 2008). In other words, a new product is the physical translation of a technical invention into the social or economic realm. Based on her IT experience, Annie Gentès contends that designers interpret technology in a narrative way, by putting it in a semiotic context. On the other hand, engineers/researchers rely on a descriptive narrative of technology, removing it from external factors. These two representations, partially similar, complement each other: designers try to put technology into context, while engineers/researchers highlight its limits.

In our research, the synergy between representation modes echoes the contribution each practice brings to each other. These contributions were more easily identified during the interviews.

A designer explained to us that he did not want his work to bring answers that were “lackadaisical or prospective or vaguely explanatory”. He readily admitted that his “competence level quickly reached its’ limits”, and that was his motive for turning to scientific help. He identified the limits of his practice: “It is not my wish or in my interest to work on my own. Because then it means I become myself a kind of scientist (...) or aping a scientific approach. I am a lot more interested in new collaborations (...) instead of believing I am omnipotent, capable of being the designer, the scientist and the researcher at the same time.”

This statement is shared by numerous researchers who clearly identify their contribution in the same manner. For example, the researcher in agricultural science previously discussed, talked about his contribution as a “scientific token”.

Back to the scientist. The designer’s expected contribution supports Annie Gentès’s conclusions. The inclusion of the designer in the lab process can show the limits of lab-based technology.

A researcher in signal technology related to us the instance of a workshop between his lab and a design school. He wanted to “find out the real problems, (...) the real roadblocks for the use of (his) tools.” The researcher was attempting to put his work in context: “because we are developing computer tools, but we don’t really know their end-use. We usually get feedback this way, enabling us to improve our products.”

Even though we encountered the evidence of these reciprocal contributions throughout the literature we read, our interviews brought to light the reverse relationship. We noted it more frequently on the researchers’ side, as they too reached the “limits of their competence level”.

In these instances, the designer will not push the boundaries of a technology, but will put it in a context that will open new frontiers for the researcher to study.

A designer related his experience in a project concerning anti-personnel mine boots. His initial thought process was to forego resistance to explosion, and concentrate on finding a boot shape to deflect the blast. He contacted a ballistic research lab "so they could share their knowledge" and "validate his theories". We are here in a classic designer/researcher relationship. But it transpired that "there was little knowledge in that field, and the mine blast effect in itself was ill-defined." The designer's question led the lab to "finance part of the studies", which in turn led to scientific discoveries later published.

Conclusion

In summary, our study has enabled us to characterize 2 typical cases in designer/researcher collaborative efforts.

In the first instance, the reciprocal contributions are identified by Annie Gentès: the researcher brings knowledge and new technologies, while the designer tests them in context. These collaborations are limited in time, short and organized between institutions such as research labs, design schools, design agencies, art centers, etc.

In the second instance, the collaboration brings a reciprocal influence in each field: the designer's idea nourishes the researcher's work, and the latter re-adjusts his studies at the former's contact. These cases are usually part of a traditional collaboration. However, some collaborations become permanent, and give birth to new organizations. Various projects such as Variable Environment², a joint effort between EPFL³ and ECAL⁴, was the forerunner of EPFL+ECAL Lab, a "new EPFL unit in collaboration with ECAL", whose strategy is "stimulation between fundamental fields of innovation"⁵.

It shows that new structures enhancing collaboration need to be established. Whereas designers seem to be less constricted in their professional activities, it does not seem to be the case for researchers. A young scientist who worked several times with designers, explained he would not be able to pursue the collaboration in the research field, and that he "would have to quit research."

References

Blanco, E. (1999). Les brouillons, révélateurs et médiateurs de la conception, *Ingénieurs au quotidien, Ethnographie de l'activité de conception et d'innovation*, Presses Universitaires de Grenoble (PUG), 181-201.

Cross, N. (2001). Designerly Ways of Knowing : Design Discipline Versus Design Science," *Design Issues*, vol. 17, 49-55.

Frayling, C. (1993). Research in Art and Design, *Royal College of Art Research Papers*, vol. 1.

Gentès, A. (2008). Design et médiation créative dans les technologies de l'information, *Hermès, N° 50 : Communiquer-innover : Réseaux, dispositifs, territoires*, CNRS, 83-89.

Hatchuel, A. (2006). Quelles analytiques de la conception ? Parure et pointe en design, *Le design : Essais sur des théories et des pratiques*, Editions du Regard, 2006, 147-160.

² http://sketchblog.ecal.ch/variable_environment/

³ Ecole Polytechnique Fédérale de Lausanne (Federal Institute of Technology of Lausanne)

⁴ Ecole Cantonale d'Art de Lausanne (School of art and design of Lausanne)

⁵ <http://www.epfl-ecal-lab.ch/>

Vinck, D. & Laureillard P. Les représentations graphiques, leur rôle dans la coopération entre métiers, *Ingénieurs au quotidien, Ethnographie de l'activité de conception et d'innovation*, Presses Universitaires de Grenoble (PUG), 165-180.

Willem, R.A. (1990). Design and science, *Design Studies*, vol. 11, 43-47.

Author Biography

Clément Gault

Clément Gault is graduated in industrial design at l'Ecole de design Nantes Atlantique and now he is doing a PHD at Ecole Centrale de Nantes in social sciences. His research is focused on cooperation between researchers and designers. In the past, he worked with researchers on tangible interface between children and leisure robot at EPFL (Ecole Polytechnique Fédérale de Lausanne).

Anne-France Kogan

Anne-France Kogan is researcher and lecturer in communication studies at l'Ecole des Mines de Nantes in France. Her research field is focused on the organisation of information and communication technologies.