Research through design: reflection through representation

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Abstract: We explore the central role of the representation of the project, in its various aspects of process representation and final artifact presentation in real life design activities. Interesting feedback loops emerge and reveal that representation, design artifact and process documentation live in a tangled web of reciprocal influences. We make the case for the designer and researcher to take responsibility for all the representations of his work, from sketch to scrap. We finally claim that the quality of the representations is a key element to assess the design and its research-related qualities..

Key words: representation, reflection, communication, meme

1. Introduction

Research through design is a growing field that enjoys a robust internal debate on foundational questions. Different points of view draw their roots from different philosophical stances and different definitions of *design*: there are also differences of opinion on the difference between design and design research. This debate must necessarily inform the ways to assess research through design.

Heylighen, A., Cavallin, H. and Bianchin [11] use the concept of intentionality from the philosopher John Searle and break down the activities of design and design research into a set of steps that can either fit a representation to the world, by changing the representation or fit the world to a representation by changing (a part of) the world. The authors conclude that

> Design as such is not a form of research, buy may incorporate concepts that need elucidation through research - precisely because their source is not so much design practice but a much more complex network of reflective thinking or implicit cultural learnings. These concepts are part of the tacit knowledge designers use as a kind of cultural know-how, or even make explicit in a kind of know-how. Yet making these explicit is not part of the design process. Or rather it can be considered as part of it, but it does not work in the same way.

In this view, design research is the meta-activity of design and its objects of investigation are the foundational concepts of design that design itself leaves undefined.

Using a different philosophical foundation, Melles [19] discusses design research in the light of James- and Dewey's pragmatism and Rorty's new pragmatism bringing to the field the concepts of vocabulary or metaphor set and the proposal "that the projects of private self-creation and public significance may both be achieved through a broader reading of the textual artifacts of science, humanities and culture in general". It remains to be said that pragmatism through its historical evolution has a strong focus on the consequences of actions and thoughts or, in the words of Pierce's "pragmatic maxim", "Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object." ([10], p.40)

In a review and reflection paper on the Designing Design Research 4 conference, Pedgley [22] mentions that the participants seemed to agree that "design research should be directed at improving material culture to better human experiences". Furthermore,

> designing and researching indeed can be very similar endeavors. But research activity has conditions attached (e.g. systematic and intentional inquiry, documented and repeatable methods, evidence-based analysis, communicable results, contributions to identified communities and bodies of prior art, and significant findings) that need not be met through –nor be relevant to- design activity

seems to define design research as design but done under academic constraints, and with academic conditions of success.

In the context of interaction design, Zimmerman, Forlizzi and Evanson [31] define the activity of design researchers in the interaction context as "interaction design researchers engage wicked problems found in HCI." (ibid.), which brings up the concept of "wicked problem", defined by Rittel and Webber [23] as "a problem that because of the conflicting perspectives of the stakeholders cannot be accurately modeled and cannot be addressed using the reductionist approaches of science and engineering". [31] goes on to define this activity as the integration of true knowledge from behavioral science with "how knowledge" of an engineering and applied nature. This integration allows design researchers to design the right thing, an artifact that embodies a framing of the design problem and that can be read as a source of design direction for commercially successful products. These definitions and visions seem only partially correct in the light of work such as Florman [9] and Pacey [21] that establish that the "how knowledge" cannot be taken and applied like a coat of paint, since technology and technologists have their own internal drivers, such as virtuosity, curiosity and vanity. Not to mention the fact that the true knowledge should really be written as "true" knowledge, in the light of history of science, philosophy of science and sociology of science providing a picture of science as a process of making-science, rather than a stack of true results ready for application.

Other authors downplay the meta- statute of design research: Stappers [28] states that "this is the essence of 'research through design', i.e., that the designing act of creating prototypes is in itself a potential generator of knowledge", bringing again to the foreground the multiple roles of the prototype and positioning design research at the very head of the design process. From a slightly different angle, Sanders [24] places the historically changing site of design research at the fuzzy front end of the design process, where the stakeholder, possibly converted into a co-creator, can be involved at the very beginning of the design activity.

Horváth [12] sees design research as a conduit between "basic" research and practical application with three forms: research in design context, design-inclusive, and practice-based design research.

1.1 Including the excluded

We could continue plundering the literature for more definitions of research through design (or of design research: the terminology seems in flux), but we stop here because of a sense of discomfort: the definitions of design research that we find in the literature seem to exclude certain designers and architects of the past that we hold very dear, which is irrelevant, and that have proved very influential on others, which is relevant. How do we begin to discuss the works of designers like Sottsass [27] or architecture groups like Superstudio? Certainly this is not practical design, in the sense of objects that can be made or edifices that can be built. Still, the influence on the disciplines has been strong, and the meta- orientation is present, under the form of an implicit statement, that we could make explicit as "this too is a way to operate on space and objects, a future way to practice design and architecture". But where lies the fundamental difference between someone stating boringly that "the world [is] rendered uniform by technology, culture, and all the other inevitable forms of imperialism" and Superstudio making the point in a way that influence other designers and researcher? Communication, after all is one other necessary conditions of research.

1.2 Introducing iconic quality

We would thus like to introduce *iconic quality* as an element of evaluation for design research activities, using "iconic quality" as a shorthand for "the ability of an act of communication to produce in the receiver representations that are both memorable and desirable to the sender". Iconic quality refers to representations that are traded both inside and outside the project, and it can be present in the whole spectrum of design communication, from academic publication to advertisements. In the context of Cockton's [6] six meta-principles for any design process (receptiveness, expressivity, committedness, credibility, inclusiveness and improvability) iconic quality is the one of the conditions for *receptiveness*, introduced by Cockton as "receptiveness involves openness to ideas and inspiration. The world is full of such inspirations." In other words, it is that quality that ideas and inspiration must have to present themselves to the attention of the designer and the design researcher.

2. The purpose of iconic quality

Designers and design researchers manipulate the receivers of their output through aesthetics, among other things. What is manipulated is often preference, namely why something is preferred to something else. Zajonc [29] shows that affect, in the simple form of liking/disliking requires a very small amount of cognition: just being exposed to an image, without any understanding or memorization, makes experimental subjects prefer it later. Somewhat more dramatically, the same author [30] asks "Could we explain, on the basis of even the most exacting and painstaking analysis of the attributes of chili pepper and of its component utilities, why millions of people crave this spice?" and his answer is that we cannot, and we have to look at a process of family and society pressure that manages to convince people to appreciate objectively painful food.

"A taste for chili pepper is acquired through habituation, familiarization, and positive reinforcement from the social surroundings, not by means of persuasive information. On the other hand, some later preferences-say for certain makes of cars or food processors-have as their basis a rich cognitive structure" (ibid.)

Designers and design researchers have access to the precursors of affect through communication. We would like to claim that communicating in order to produce preference and improve the human experience is part of our job description, and it cannot be delegated solely to professional communicators – just like screen design cannot be delegated to professional computer graphics experts.

2.1 Iconic quality as a factor of survival for design research projects

All design ideas needs to be persuade and be propagated, even if you give away free mosquito nets to people that live in areas infested with malaria.

"According to Dr Elizabeth Juma, who is the head of malaria control under the Ministry of Public Health and Sanitation, there has been evidence of people turning the nets into fishing gear especially in Nyanza Province. Now a different group has discovered another lucrative business venture, and are using the nets to make wedding dresses." [8]

A process of persuasion must take place, more so in this time of post-optimal design. Langrish [17] makes a convincing case for a memetic [7] Darwinian analogy in which design ideas undergo a process of descent with modification under the influence of some selecting force. In this process, like in the evolution of living being, nothing guarantees that complexity increases or that improvements (for any definition of improvement) are kept in the future. Langrish goes on to argue that "The achievements of memetics so far have not been impressive" and prescribe a classification of memes in recipes, patterns that cause a selection, and explanations.

We don't claim that a Darwinian analogy is completely fitting: no analogy is, and yet they are greatly useful in forming concepts: Schön [25] p.68 points out that "... in the displacement of concepts a familiar theory is carried over as a projective model for a new situation. The structure, the clearing-up, emerges only as the metaphor is elaborated" and we do not have a perfect understanding of the biological evolution. From another point of view, more focused on products,

"Plants and animals, however, are living beings capable of more or less independent action. Products do not have much of a life independent of their human users (or at least we don't think they do!), so product ecosystems must be highly integrated with human behaviors, such as design, market activities, information seeking and sharing, usage habits, preferences, expectations, etc." [14]

In this memetic perspective, let us for a moment think that concepts (specifically, concepts that have been developed in design) use their representations as hooks for transferring from human host to human host, just like a virus uses its surface proteins and attachment methods to attach itself to a cell: or, from a happier perspective, a symbiotic bacterium ends up having a surface that lets it survive in the guts of a specific animal, and transfer

from individual to individual. This analogy, though pedestrian, has its use because it points out that every design concept has an immediately accessible surface: it is exactly the iconic quality of this surface that we would like to discuss.

At the opening of the Seventies, Baudrillard observed about objects that

> Few objects today are offered alone, without a context of objects which 'speaks' them, And this changes the consumer's relation to the object: he no longer relates to a particular object in its specific utility but to a set of objects in its total signification… Clothing , machines and toiletries thus constitute object pathways, which establish inertial constraints in the consumer: he will move logically from one object to another. [1]

Which is easy to relate to Victor Margolin's *product milieu* [18] and to the views of Kotro and Pantzar [15], and Shove and Pantzar [26]. In the same line, Baudrillard reminds us (ibid. p.108) that "culture is subject to the same competitive demand for signs as any other category of objects and […] it is produced to meet that demand." Without necessarily agreeing all the way with Baudrillard, let's propose some historical examples of projects that succeed or fail on the iconic quality metric.

2.2 The unaffordable luxury of a partially designed project

One of Buckminster Fuller's paradigmatic projects, the Dymaxion house, achieves physical reality as the Wichita House prototype in 1946, after almost twenty years of reflection, sketches and models. Its aeronautical heritage, in materials and form, is evident from the outside. A light metal shell admits light from the outside through a peripheral plexiglass window. The house is ready to take flight. The promotional photograph of the interior, though, are completely inconsistent with any ideas of progress: heavily upholstered furniture, wall hangings, abat-jour lamps and –worst of all- heavy draped curtains that hide the wonderful runaround window [20]. Apparently, Buckminster Fuller had rather well defined interests that did not include furniture design.

> And while the careful 1927 model of the Dymaxion house exhibited an unprecedented structure, its interior fittings were limited to a few cursory indications. In the same vein, the Wichita House ended up stuffed with out-of-date furniture, far removed from the principles of lightness heralded by its shiny wrapping. In each case, Fuller's contribution was limited to a series of isolated functional devices [...] The rest was not his concern. (ibid. p.66)

The architect later attributed in [2] the commercial failure of the project to a combined failure of distribution, inadequacy of building codes, hostility from banks and trade unions. But what we are concerned with is the project's cultural failure and its lack of cultural impact. We don't need to go far to find similarly strange houses that have created much stronger waves and memories, such as John Lautner's iconic Chemosphere. The rationale of Buckminster Fuller's revolutionary mechanical, mass produced concept was profound and well rounded. We believe that it has been forgotten because it was not strong enough on the representation level. It was not shedding enough images of its own, which means that somebody else, probably working for Beech Aircraft, ended up providing them according to his own lights, and probably to his own desire to make the house look like

a rational solution for normal people. For contrast, this is the decade that sees the publishing of Le Corbusier's "Vers une architecture", a source of ideas wrapped in extremely convincing images that becomes one of the main reference points for the architects of the twentieth century. If the designer does not provide representations, these representations will be provided by somebody else. They will rush in to fill a vacuum.

2.3 The accomplished research through design project

As an example of very accomplished design research project, we can point to Paul Verschure's ADA, able to produce over ten journal papers in disciplines ranging from robotics to architecture to neuroscience, and still presentable enough to be featured in newspapers and glossy design magazines [3]. An integral part of ADA is a press kit page [13] rich in material full of iconic quality.

Looking back at what now is considered classical design, contrast the documentation and report oriented, completely transparent communication of the Castiglioni brothers' studio and the highly ambiguous but very evocative material produced by Sottsass during his travels in Spain ([27], [5]). Or the future-oriented Superstudio representations of everyday objects and life in the future visually showcased in [16]; these are representations that do not even try to sketch a "realistic" vision of the future. They are scenarios of unlikelihood, sometimes entailing physical impossibilities. And yet they have exerted a strong influence on contemporary architects and designers. These representations point at modes of work and provide models.

Can we define such highly speculative and ironic visions as "research through design" in any of the senses we have mentioned before? Definitely, since these emotional unlikelihoods engage wicked problems, such as what exactly constitutes a house or a city, and through their presence (a presence that quickly becomes purely media) they act as provocations or, to use a word that has ensconced itself in the discipline, as probes launched into the future.

2.4 Prototypes as generators of representations

A special role in the generation of representations rich in iconic quality is played by prototypes. Visions of prototypes and sketches [4] present many possible uses and functions. Stappers [28] posits that "Prototypes have many roles: they are the physical place where the phenomena are confronted, where the theory comes down to earth, and all the decisions must be made to connect to the earth, not just the ones which fit nicely within the theory." One more role of the prototype is to be a source of images. It can be filmed, exhibited and drawn. What is of maximal effect, it can be photographed, a form of representation that has a very low entrance threshold and bandwidth requirement. If one looks at the blogs that currently are the harbingers and definers of what is interesting design, you get one shot. In other words, one photograph.

The Apple universe plays with these notions, with its galaxy of blogs that publish potential new or sometimes clearly fake future Apple products and prototypes, sometimes as 3D renders by fans of the brand. The customer is constantly teased and kept on the edge of the next big thing. Like every form of communication that can generate fascination and excitement, Apple's is highly polysemic, blending extreme consumerism with apparent austerity of form, encouraging buyers to "think different" while offering a limited product line at every given moment; lastly managing to project a sense of caring for the environment while pursuing a strategy of

encouraged obsolescence on its products. Contradictory values and behaviors guarantee that there is a facet of Apple for every customer. If we wanted to search for a similar perspective in the history of architecture and design we could point to Le Corbusier or Mies van der Rohe austere forms applied to luxurious materials resulting in very luxurious objects.

3. Conclusion

We have tried to place representations in the foreground as an important component of the quality of a design research project, by looking at design representations in their role of hooks for the design research "ideas". We have started from a sense of unease at seeing certain historical thinkers excluded from the definitions of research through design, and from a visceral, personal, sense that design has something to do with images and representations. After defining the criterium of iconic quality as a fundamental survival feature of design ideas, we have applied it to certain historical and contemporary design and design research activities to explain their influence or lack thereof in following work. We don't mean that design researchers should focus solely on achieving iconic quality, but we feel that a push in the direction of strong, fascinating, thorough and memorable representations can only help this field prosper.

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