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EVOLUTION, EPIGENESIS AND/OR RECYCLING IN DESIGN THEORIZING

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Abstract

When speaking of design theorizing, Jonas has noted that within our field of design research, 'hardly anyone is looking for connectivity and possible links between different approaches'. This paper contributes to addressing this shortcoming.

I make reference to some recent literature on nature of design within the field and use this literature as a baseline to compare other ideas presented at the 6 th European Academy of Design Conference (EAD06). I examine to what extent the ideas are evolutionary, epigenetic and/or recycling. This paper is a commentary aimed to encourage connecting ideas and building a collective dialogue.

Keywords

Design theorizing, Meta-discourse, EAD06

Introduction

I have not reflected on design for a very long time, just a few years. I have learned two things that I believe important to keep in mind when thinking about design. Firstly, anyone can define design all he or she wants and desires, and there are many different expressions on design. Here are some examples (arranged by years):

• 'Everyone designs who devises courses of action aimed at changing existing situations into preferred ones' (Simon 1991: p.111).

• '… our new definition of designing *as the initiation of change in man made things*' (Jones 1992:p.6 italics in original).

• 'Design is the human power of conceiving, planning and making products that serve human beings in the accomplishment of any individual or collective purpose' (Buchanan 2001a).

• 'Design is the ability to imagine, that-which-does-not-yet-exist, to make it concrete or concretized form as a new, purposeful addition to the real world' (Nelson 2002).

• 'Design is a noun referring to a specification for making a particular artefact or for undertaking a particular activity. 'Designing - non routine human internal activity leading to the production of a design' (Love 2002).

• 'Design is a network of chunks of ideas and activity patterns in the interface region between the contextual and the artefactual' (Jonas 2004:p.222).

The above definitions are by no means representative let alone comprehensive of the many proposed definitions. Our colleague Terrence Love (1998) has compiled a 30,000-word annotated bibliography on the definitions of ‘design’ made between 1962 and 1995 in Engineering alone. As it appears, definitions of design are as many and various as those who define it.

Secondly, the more design is understood as a general and important phenomenon outlined above, the stranger it is to see design as a specialized profession or even a discipline and the more difficult to privilege the discourse risen from these institutions. Tony Fry (2004) argues against design studies as a discipline and considers it counter-productive. He makes it his mission to bring other disciplines to go beyond what he sees as a functionalist discourse. It seems, at certain moments, design theorizing should inevitably and eventually render it everyone's business.

The implication of these observations is simple. The universe of design theorizing, like design, is huge. What is design and what is a theory of design are questions that will find different and many answers as long as ideas of design keep changing in the cycle of design theorizing and as we come and go in the cycle of life. Referee 1 who has evaluated the abstract is right in pointing out that to evaluate the originality of ideas at EAD06 will require a comprehensive study of all design theories. This is an impossible task. My attempt here is modest.

I will make reference to limited literature spanning a limited time frame within a limited universe known as Design Research. Some of the literature used for discussion has already been mentioned. Even though these theories are quasi, traditional, and might not be the most exciting; they are home grown and deserve recognition and examination. This literature is quite recent, representing our current thinking on design and I will take it as previous theories to compare other ideas presented at this conference. I will examine to what extent the ideas are evolutionary, epigenetic and recycling. The aims of the exercise are to encourage connecting ideas, learning from each other and building a collective dialogue … however limited.
The motivation for these aims is an interest in a critical culture of design theorizing within Design Research. Many of us talk about design by drawing on many sources outside of Design Research. However, few of us refer to one another, except notably for the cohort of researchers studying the cognitive aspect of designing . Jonas has noted, ‘hardly anyone is looking for connectivity and possible links between different approaches’ in design theorizing (2004:p.15). This paper is an attempt to contribute to addressing this shortcoming. It is therefore not pretended to be groundbreaking in charting a new direction for design theorizing, but rather it is a commentary meant to serve as a trigger for discussion.

In the followings, I will first explain why I choose originality as focus for evaluation and introduce the three evaluation measures. Then, I will engage in painting a picture of design by integrating various previous theories, followed by discussions on some selected papers and will conclude with an open end.

Three Yardsticks for Measuring Originality

Why focus on originality as there are other well-established criteria to evaluate theories, particularly scientific theories? The choice of evaluation criteria although is based on reason and tradition, it is also related to value and preference. For instance, Friedman (2002) drawing on Whetten, suggests to use the following criteria to build design theory: comprehensiveness, parsimony, explanatory power, and substantiation of empirical data. This is a reasonable suggestion but it is different from the criteria used, for example, by Savery (1989) when he discusses the significance of John Dewey's philosophy. Savery suggests four

criteria: originality, consistency, comprehensiveness and fruitfulness. The point of contrasting Friedman's criteria with Savery's is not to show that there are differences in evaluating scientific theories and philosophies, but rather that criteria are debatable. While there are common and well established criteria, they are not universally or equally valued.

I am most interested in originality of design theories for I believe the following points made by Savery are also true with ideas on design.

If a philosophy is not consistent as a whole the parts may be important and the philosophy may be somewhat transformed by successors so that consistency is secured, and a doctrine of narrow range may still have great value; but without originality a philosophy is only a transmitter of more ancient wisdom, and without influence its value is entirely self-contained. In a word, an important philosophy is novel in itself and in its effects.' (1989: p.481)

For gauging the originality of ideas presented at the conference, and being in line with the viewing angle of the conference organizers, I use three metaphorical yardsticks: evolution, epigenesis, and recycling. According to Gregory Bateson (1980: 51-53), there are two ways organism renews itself and keeps its species alive, namely evolution and epigenesis. Evolution is ‘the ongoing processes of change feed on the random’. Epigenesis is ‘act of becoming which must be built upon the immediate status quo ante’. Species lives on in the hybrid/tension of evolutionary change and epigenetic growth. Bateson never talks about recycling, but I believe it is also a survival principle, at least in design theorizing. Generally recycling is understood to be a series of activities by which discarded materials/waste destined for disposal are collected, sorted, processed and converted into raw materials and used in the production of new/marketable/ useful products. Recycling is, in a sense, to keep something alive. However; unlike evolution, it creates no (real) change; and unlike epigenesis, it creates no growth. I will examine to what extent the ideas are evolutionary: mutating from previous theories offering different perspective; epigenetic: building on previous theories - expanding, deepening and bringing them to higher levels; and recycling: saying the same thing differently and offering no new insight.

A Design Cross - A Sketch of Design

Similar to theorizing on design, there are various ways to organize and tell a story of design discourse. In other words, there are different approaches to conduct meta-discourse. For example, one can take the four 'generative principles' by Buchanan (2001b) to map design theories, or the 'meta structure' proposed by Love (2000) or the ‘evolutionary model’ by Findeli & Bousbaci (2005) at EAD06. Like definitions and theories, meta-discourse is pluralist. Structures are imposed lenses that help see with meanings, make arguments and serve particular purposes. There are no true or false but only good or bad lenses.

For our purpose here, I make up a design cross by interpreting and integrating some recent works. The ‘design cross’ composes of two dimensions illustrating that I see as major clusters for design theorizing, differentiated by fundamental research questions. The distinct features of the ‘design cross’ are that it is integrative and ecological (non-hierarchical). However, the ‘design cross’ is not sacred, nor is it surprising. I expect most readers are familiar with the main ideas illustrated here. The ‘design cross’ is mainly informational rather than analytical to help set a context for discussion.

Sless (2002b) offers a straightforward and simple suggestion for what design is:

'Designing is our most developed form of practical adaptation to our environment. It is the means by which we, as biological entities, change to meet the demands of our environment, and make changes to environment to adapt it to our needs.’

People design to effect a change of existing situation by the making/introducing a product (in the widest sense). The existing situation - natural, artificial, or social - is causing problems or as Nelson and Stolterman (2003: p133) point out, people just have a desire to change it.

Design implies human agents and their intentions and goals and their dealing with the environment by design to achieve their goals (See Buchanan in ‘Introduction’).

This suggestion implicitly places design between us and the environment and this view is related to but different from how Jonas sees design. Jonas (2004) joins Alexander, Bonseipe, Simon and Buchanan to see design as interface (See Jonas in ‘Introduction’).

Jonas does not emphasize human agency or intention, but his idea can be integrated with others. And the integration is best visually illustrated as a cross as there are two levels of analysis involved. I name this integration the ‘design cross’.

Artificial

Human (intention) **Design** Environment

Contextual

On the horizontal dimension, design is depicted as in between humans (their intentions implied) and the demands and constraints of the living environment. This represents a 'zoom out' view of design and describes it on a more general – sociological-cultural-biological-ecological level. Vertically, design is depicted as an interface between the artificial and the contextual. This represents a 'zoom in' view and describes design on a more specific - technical level. If you will, the 'zoom out' view is on the macro level of analysis, and the 'zoom in' view is on the micro level. To describe it verbally, design is an interface between the artificial and the contextual that is an activity which people engage to change the environment to fit their intention.

The design cross locates design in the relations between artifice, context, human (intention) and environment. However, there is still a very essential characteristic of design that needs to be added. Central to the discourse on design is the recognition that the subject to be created through design is uncertain or indetermined. Nelson and Stolterman place special emphasis on the uncertain aspect of designing in their definition of design (See Nelson in ‘Introduction’).

At the beginning of each design project, the existing situation (the context), desire or intention to change may be recognized and the goal of design may be known; however, no one knows beforehand what the final product or the subject matter of design will be. The product to be made is always indetermined. Buchanan (1995) calls this a 'quasi matter, an indeterminate subject waiting to be made determinate'. Nelson and Stolterman (2000) make the same point when they describe design as 'service'.

'Service is not about helping people create what they already know they want. The success of the design process can be best determined when those being serviced experience the surprise of self recognition between what emerges from a design process and their original expression of that which they dimly perceived as desirable in the beginning (their desiderata)' .

Uncertainty is always a condition of designing. This important characteristic, therefore, needs to be added to the ‘design cross’. The question mark '?" represents uncertainty. To describe it verbally, design is an interface between the indetermined artificial and the contextual that is an activity which humans engage to change the environment to fit their intention.

?Artificial

Human (intention) **Design** Environment

Contextual

Due to the condition of uncertainty, designer must conceive what a product to be. As Buchanan (1995) says, designing

'has no special subject matter of its own apart from what a designer conceives it to be ... in the process of application, the designer must discover or invent a particular subject out of the problems' .

And here is where the major agreements end and even more theorizing begins. The cause and the process of coming up with a design solution (the vertical dimension) are central for much design discourse and design research. The oldest articulation attributes the cause to creativity and intuition. Besides, there are many more concepts used to describe this, including 'abductive reasoning' (March drawing on Peirce 1976), 'ill-defined problem solving' (Simon 1973), 'wicked problem solving' (Rittel 1973), 'construction' (Schön 1988), 'innoduction' (Roozenburg & Eekels 1995), 'placement' (Buchanan 1995), 'letness' (Sless 2002a), ‘disclosure’ (Newton 2004) and chemicals. Space does not permit elaboration on these various viewpoints here, but when necessary I will come back to them.

Before we use the design cross as a baseline to examine papers presented at EAD06, it is worthwhile to note that although the design cross has its virtues, it ultimately does not depict the dynamics of design fully. The major problem with the cross is that human, design, the artificial and contextual are parts of the environment. They are not so neatly separated as distinct entities. Here I stop deconstructing my own creation, but will do so later as part of the (self) examination. Accompanied by the three yardsticks and the ‘design cross’, I turn now to the papers.

Ideas on Design at EAD 06

I have identified those papers that reflect on the nature of design. Just to be clear, approaches, models, methods and tools for design research/practice/education are not considered here. The decision is practical. It is theories of design on which all other articulations can find a home and thus in this sense, foundational. I know, you know, my friend David Sless and others will disagree with this. Theorizing about design can be quite independent of and at times totally irrelevant to design research, practice and education. While admitting this possibility and actuality, I do not believe it has to be so. A good example is ‘Creativity and Evolution: A Metadesign Perspective’ at EAD06. The author grounds a design practice approach on ideas on the nature of design. In this case, theory of design is the way by which the approach to design practice is re-organized. Advancing theories of design potentially supports other theoretical and practical development in design research, practice and education.

I divide the selected papers into two clusters. The first cluster contains papers that explore the cause or process of coming up with a design solution. It locates in the vertical dimension of the ‘design cross’. The second cluster includes articulations on the general nature of design that is comparable to either the ‘design cross’ or the horizontal dimension of the ‘design cross’.

Cluster 1: The Cause and Process of coming up with a Design Solution

'Design noise, liminality and nonknowledge' - design process as ‘noise’ reduction.

'Sapiens and demons in design thinking: Perception as core' – design process as perception, perception as self-organizing-information-system.

Design Processes as Communication of Anticipative Models' – design process as uniformed self-referential interrelation of communications.

Cluster 2 The General Nature of Design

'Designing Peirce' design as a theory of Peirce: semiotics, ethics and aesthetics.

'Design a harnessing of unintelligible causes' design as an overlay to the map of nature/science.

'Design is the alternative to tradition' - design as creation in culture, culture as cultivation of well being.

Defining an object of design by the means of Cultural-Historical Activity Theory' – design as purposeful change in mediated relationship.

'Unknowledge: on the imaginary of the artificial'

Design as effecting.

'Design theory is a philosophical discipline: Reframing the epistemological issues in design theory' – design as a theory of Dewey.

'The existential delights of the designer: Towards a notion of works' - design as life, what else?

Face to face with Artefacts - design as interface, interface as action, action as a temporal association of actants, actants as 'dependency grammar', 'structural semantic', 'actor network theory' and 'agent technology'.

Commentaries

After studying all the papers of concern, I believe in the whole, we are not evolutionary or particularly epigenetic or entirely recycling. As a matter of fact, my yardsticks prove to be irrelevant as evaluation criteria because most authors seem to be unmindful of relating their work to what has been done within Design Research. Most authors hardly identify problems in existing literature about the nature of design. We hardly build on previous work either to deviate from them or to deepen them so that the gaps in existing knowledge can be filled. Besides a lack of link to previous work, and probably as a result of that, most authors do not state the specific problems that their theories of design address, perhaps except the very old problem of creativity or that is now often called by the economical name 'innovation'. Without an articulated/ identified problem, our investigation is at best inspirational or at worst idle. It seems that design theorizing at EAD06 is more like art production, in the sense that each piece stands alone as individual valuable expression of some human conditions. At the brighter side, there are disconnected inquiries, and at the darker side, works that run the risk of recycling what has already been articulated. Although at times articulating the same ideas using different languages are interesting and might provoke different thoughts, there is still a need to place one's work in the context of others if we are to call ourselves a field.

There is a problem in our practice of theorizing as a collective, alas as a field. For fear of sounding like a grumpy person, I will rephrase by saying that we have reached a state where individual inquiries into design are sufficient and made available, and now we should move to collective inquiry. I propose that we should

make a special effort to study others' works and those that have been done before. I will now try to initiate a discussion to serve as a contribution rather than an exemplar to my own proposal.

What we ought to do next, I believe, is to position ideas at EAD06 with what have been expressed before. What do our theories offer that the 'design cross' does not? To answer this question more than superficially, it is necessary to look at the fundamental assumption underlying both. I risk my fame and fortune to say that they are fundamentally the same, if anything, our theories offer only thematic changes in expression. Let me explain.

As the design cross indicates, we have in the middle of the whole world, an idea of design that is between human (intention) and nature-cum-culture (in short, environment) of which design and humans are a part. How can design be a part of something and in between something is a philosophical question or a language game that I am unable to address here. What I would like to point out is that this very image of design underlies all the papers submitted. When we construct ideas on design, we have this acknowledged or unacknowledged assumption to begin with. This assumption directs how we read into Dewey, Pierce, Luhmann, Bergson, Darwin, Sartre etc etc. The results, our papers, are expression or elaboration of the assumption in the concepts and language of these great thinkers. Nothing fundamental has been changed or advanced. This is not a small issue, as a field of inquiry.

The most often heard reason for theorizing design is that it can be the foundation, anchor, or scaffolding for design research, education, and practice. If all we do is to borrow theories of knowing, learning and practice to re-articulate our assumption of design, there is really little need of the effort. We can simply close the shop, and join other disciplines that have much richer research experiences and backgrounds. Now, these are very negative words, but they are not meant to be discouraging. I merely point out a possible ending if we do not attend to our way of theorizing. There is lurking a danger. We risk trading theory of design, with theory of knowing, society, cognition, evolution etc, etc. A sign of this danger can be detected in the research program 'design thinking'. Allow me to digress to this example.

The line of research on design thinking is one that has generated the most studies and been around the longest. Based mainly on cognitive sciences for theories building and research methods, efforts are made to describe the cognitive processes of designing – how designers solve problems. Informed mainly by the work by Herbert Simon (1969) and Donald Schön (1983), the goal is to develop a theory of designing that is domain independent and to develop design methods and recently design education based on this understanding. The work is published often in the Journal 'Design Studies' and presented at a series of conferences titled 'Research in Design Thinking'.

The assumption underlies this line of research is that designing is equal to cognitive process. Design process can certainly be seen as cognition, but design process is not cognition although designing involves or requires cognitive functioning. This is a difference between 'is' and 'has'. When we inquire into the nature of design process, we are interested in what 'is'. Now asking what design process 'is', we need to identify/invent what is substantial rather than accidental to it. Yes, I am invoking Aristotle' ten categories of being. Cognitive process is an accident to designing as color is an accident to rice. In other words, cognitive process, like color, is only an attribute. To see and talk of design as cognition results in a cognitive theory rather than a design theory. This, however, is not to say that cognitive theory has no relevance to advance our understanding of design process, it certainly does when it is organized and reinterpreted within our understanding on the nature of design process.

What we can conclude from the above discussion is that a theory of design process can not be founded on cognitive theories or any other theories (e.g. knowledge, society, evolution). Instead, our own ideas on design need to be constructed so that other theories (from other fields) can be assigned a proper place. That also means efforts need to be made to examine our own ideas, such as the 'design cross'. Allow me to give another example.

One of the main assumptions in the design cross' is that intention is a chief characteristic of design. Some insists that design necessarily implies/requires intention. Anything made that is not done with intention should not be considered as design. However, this assumption is quite shaky when placed against relatively recent inquiry into the concept of intention. The literary scholar Swinden (1999) tries to resolve the problem of authorial intention by drawing on quite a number of philosophical sources, including Wittgenstein, Ryle, Goldman; and comes to this conclusion:

The concept of intention has been carefully examined in the philosophy of mind and the philosophy of action, and though there is no more settled positive opinion in this than there is in any other field of philosophy, it would be true to say that there is a settled negative opinion to the effect that it is a mistake to describe intentions as causes, and either it is a mistake to describe intention as actions or it is necessary to be more than usually circumspect in so doing. Until recently, however these developments in philosophy have had little impact on literary criticism' (Swinden 1999:25).

We might replace literary criticism with design theory in the above quotation. If intention is not a cause, not an action, and but rather 'a positive state of mind' that accompanies an action, then what is left of 'intention' in our theory of design? As I see it, not very much. 'Intention' has no real meaning without an action being interpreted. Without an action, intention cannot be thought of, identified, and examined. In other words, intention is post-facto. As such, how can something post-facto be a (pre)defining characteristic of the meaning of an action, such as design? Intention is subsumed under action, and cannot be used to pre-describe or to define design without substantial qualification.

OK, the above analyses are crude and do not do justice to the problems they tackle. However, I hope they demonstrate the necessity to change our habit of theorizing. What is important is less about the validity of these examinations but more about the proposal to adopt a habit of collective inquiry, as attempted in these examples. Study others' works, identify problems and propose evolutionary or epigenetic changes to keep design theorizing alive and kicking.

Final Remarks

I have examined various theories of design presented at EAD06 and suggested that these theories are fundamentally the same as the 'design cross'. I have identified some problems in our habit of theorizing, and proposed to attend to them. I have given two examples as contribution to my own proposal. And now, the floor is open.

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See website EAD06 (ead06.hfk-bremen.de), webpage REVIEW, section ABSTRACT, date JUNE 28, 2004, title EVOLUTION EPIGENSIS AND/OR RECYCLING.

It is referee 2 who has tipped me of this critical comment, see website EAD06 (ead06.hfk-bremen.de), webpage REVIEW, section PAPER, title EVOLUTION EPIGENSIS AND/OR RECYCLING.

Thanks to Cameron Tonikwise for reminding me that those involved in Design Thinking Research Symposium have over the years referenced one another. They have built a volume of literature if not a body of knowledge.

Judgements are called here as in some papers, there is quite extensive elaboration on the nature of design to build arguments for methods and tools. The choice of papers are those that particularly examine the nature of design and submitted before December 20, 2004 (the deadline for first paper submission).