

Review

Vaishnavi and Kuecher have performed a challenging task in collecting the material of design research to their portal.

I have some minor clarifications, amendments and criticisms which I shall present in the same order as the excerpts are in the text.

a) “Design research is yet another "lens" or set of analytical techniques and perspectives (complementing the Positivist and Interpretive perspectives) for performing research in IS.” When the authors took both the positivist and interpretive perspectives, they assumed the consensus view, but Deetz (1996) *supplemented* those two perspectives with the dissensus view and with the *critical* and *dialogue* perspectives.

b) “Design research involves the analysis of the use and performance of designed artifacts to understand, explain and very frequently to improve on the behavior of aspects of Information Systems.”

The verbs ‘improve’ and ‘analyze’ in the excerpt above refer to ‘build’ and ‘evaluate’, which March and Smith (1995) saw as two main functions of design research. Hence, the authors added verbs ‘*understand*’ and ‘*explain*’ which traditionally are connected with the *interpretive* and *positivist* perspectives, and at the same moment with natural and social sciences, respectively. Another interpretation were that the authors enlarged or deepened the domain of design research with two verbs, ‘understand’ and ‘explain’.

c) “Such artifacts include - but certainly are not limited to - algorithms (e.g. for information retrieval), human/computer interfaces and system design methodologies or languages.”

I use term innovation instead of artifact, and I *describe* which kind is the *final outcome* of the design project, but *not how it was built*, i.e. which design methodology was followed when the innovation was accomplished.

d) The authors refer to Orlikowski and Iacono (2001) in the introductory section. To my mind, the reference is not very suitable, because Orlikowski and Iacono did *not* with any phrase *refer to design research*, in other words, their text only reflects the application of research methods used in social sciences.

e) “*Understanding* in most western research communities is *knowledge that allows prediction* of the behavior of some aspect of the phenomenon.”

After carefully reading the text in the portal I believe that Vaishnavi and Kuecher include people into the domain of design research, may be into an artifact, too. According to my conception of human being, her *behavior cannot be predicted* because of free will.

f) The authors refer to the works of Maturana and Valera. I had possibility to follow Aulin’s lectures when he wrote his book (Aulin 1989). He then criticized their approach as *linguistic* one, and it cannot be used in explaining activities of people. Maturana and Valera considered *biological organisms* and their results are more suitable for other living members of nature than people (cf. item e above).

g) “We emphasize this further by referring to the aeronautical engineering example given earlier in this page: aircraft flew decades before a full understanding of how such flight was accomplished.”

This phrase does not refer to anything. *It might belong to some earlier version of the portal.*

h) “Design research can contribute to better theories (or theory building) in at least two distinct ways, both of which may be interpreted as analogous to experimental scientific investigation in the natural science sense. First, since the methodological construction of an artifact is an object of theorizing for many communities (e.g. how to build more maintainable software), the construction phase of a design research effort can be an experimental proof of method or an experimental exploration of method or both.”

First, I differentiate a method from a theory or model in the similar way as March and Smith (1995).

Second, in natural sciences a tentative theory can be either confirmed or falsified, but in design research we can build a new (normative) method by which we can or cannot construct an artifact; in the successful case we ‘prove’ the new method by demonstration.

i) “Second, the artifact can expose relationships between its elements. It is tautological to say that an artifact functions as it does because the relationships between its elements enable certain behaviors and constrain others.”

I understand that the artifact functions according to its specifications. The artifact is a new part of reality, and the model of that part is the model of the new phenomenon. I assign term ‘model’ to natural and social sciences, because the phenomenon in nature does not have any *goal function*, but the *artifact has such one*.

j) “(Theoretical relationships enter the design effort during the abductive reasoning phase of Figure 3).”

The sentence is *only valid for the components behaving regularly*, but people are not such kinds of components (cf. item e above).

k) “It is typically only in multi-paradigmatic or pre-paradigmatic communities - such as IS - that researchers are forced to consider the most fundamental bases of the socially constructed realities (Berger and Luckman, 1966; Searle, 1995) in which they operate.”

In connection with different conceptions on generalizability Lee and Baskerville (2003) considered both positivism and interpretivism. Concerning the latter they describe: “A key feature of interpretivism that differentiates it from positivism, and hence also differentiates its approach to generalizability from positivism’s approach, is that interpretivism acknowledges the existence of a phenomenon that is not present in the subject matter studied by the natural sciences. People, who are integral to the subject matter that a social scientist observes, develop and use their own subjective understandings of themselves, their setting, and their history. Therefore, already present in the subject matter of the social sciences are the meanings that people create and that they attach to the world around them. In this sense, subjective meaning is objective reality: The meanings that human subjects create, communicate, and hold are part and parcel of the world that a social scientist receives as the subject matter under investigation. The presence of humanly created, and therefore sometimes contradictory, meanings and socially

constructed realities in the subject matter of the social sciences has no counterpart in the subject matter of the natural sciences: ‘The world of nature, as explored by the natural scientist, does not ‘mean’ anything to molecules, atoms, and electrons’ (Schutz 1962-66, p. 59).” Hence, by speaking about “socially constructed realities” Vaishnavi and Kuecher evidently *took the stance of interpretivism*.

l) “Our first addition is the stress on *iterative circumscription* (cf. Figure 3) and how this essential part of the design research methodology iteratively determines (or reveals) the reality and the knowledge that emerge from the research effort.”

In the construction *designers are building a new reality*, not “determining (or revealing) the reality”.

m) “This iteration is similar to but more radical than the hermeneutic processes used in some interpretive research.”

The iteration in the construction process belongs to the *design research* perspective is intended to *build* something (*future-oriented*), but the hermeneutic cycle belongs to the *interpretive* perspective and is intended to *analyze* something happened (*past-oriented*). To my mind, iterations are not quite similar.

n) “The obvious contrast is with positivist ontology where a single, given composite socio-technical system is the typical unit of analysis;”

March and Smith (1995) and Hevner et al. (2004) did not take the socio-technical system as a unit of analysis. They explicitly excluded people from their artifact and took the technical part only.

o) “The abductive phase of design research (Figure 3) in which physical laws are tentatively composed into a configuration that will produce an artifact with the intended problem solving functionality virtually demands a natural-science-like belief in a single, fixed grounding reality.”

The sentence above *concerns the regularly behaving material and data resources only*, not people, i.e. not social resources, because of free will (cf. item e above).

p) “Epistemologically, the design researcher knows that a piece of information is factual and knows further what that information means through the process of construction/ circumscription.”

Please, concerning information/data note the difference between *descriptive facts* or *constitutive meanings* (which corresponds to difference between the positivist and interpretive perspectives) (Iivari 1991) (cf. item k above).

q) “Axiologically, the design researcher values creative manipulation and control of the environment in addition to (if not over) more traditional research values such as the pursuit of truth or understanding.”

March and Smith emphasized utility of the novel artifact. Van der Heijden (2004) showed that for hedonic (pleasure-oriented) systems, perceived enjoyment is a stronger predictor of behavioral intention to use than perceived usefulness. These citations do *not* underline *truth and understanding* as desired values in design research *but utility and pleasure*.

r) “In this sense design research is very similar to the action research methodology of the interpretive paradigm,”

I agree with Vaishnavi and Kuecher when they see design research very similar to action research, but I cannot agree with them when they claim that action research belongs to the interpretive paradigm, because the researchers following the interpretive paradigm develop sets of concepts, or specialized language, with which to characterize phenomena, describe the nature of reality with a certain theory. Action researchers’ intent is to plan and to take action in order to change a part of reality.

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