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Elaborating ADR while drifting away from its essence: A commentary on Mullarkey and Hevner

Background

We start this commentary on Mullarkey and Hevner's insightful article with a clarification. In the article, they present an elaborated process model of a genre of Design Science Research (DSR) called Action Design Research (ADR) as articulated in a paper co-authored by us (Sein, Henfridsson, Purao, Rossi and Lindgren 2011). To do so, they combine ADR with aspects of another genre of DSR, one depicted in a well-cited model developed by Peffers, Tuunanen, Rothenberger and Chatterjee (2007). Both of us reviewed Mullarkey and Hevner's paper as it made its way through the review process. In general, we have been positively inclined and one of us had specifically commented in the first round review "I would like to see this paper published in EJIS". In subsequent rounds though, it became clear that some of the concerns we had expressed in our reviews reflected deep disagreements with Mullarkey and Hevner's understanding of some key premises of ADR, which in our opinion went against the very essence of ADR. In spite of our concerns, we are indeed glad that the paper has been published. Healthy disagreements leading to open and engaged discussions are the very essence of academic discourse. It is in this spirit that we write this commentary.

Agreeing with Mullarkey and Hevner

There are admirable and appreciated ideas and thoughts in the paper by Mullarkey and Hevner. They essentially propose four extensions to ADR, with three of which we agree. They are:

First, they unpack specific stages of ADR [The stages are: 1) Problem Formulation, 2) Building, Intervention and Evaluation (BIE), 3) Reflection and Learning and 4) Formalizing Learning]. The cyclical representation of ADR and the ADR process model are good and worthwhile elaborations by essentially turning different building, intervention and evaluation cycles into full ADR cycles. In their proposed ADR Process model, they suggested an explicit Diagnosis stage. This is a valuable extension. While defining a problem is the first step to understand what needs to be solved, diagnosing the problem is the vital act that leads to how the problem may be solved. In doing this unpacking, Mullarkey and Hevner have taken ADR closer to its Action Research (AR) roots (see for example forms of canonical AR in Baskerville and Wood-Harper 1998).

Second, they offer excellent suggestions to make all the stages of ADR transparent. While Sein et al. (2011) clearly delineate the different stages of ADR, they do not go into details. This leaves quite a bit to flesh out for those who apply ADR. This was deliberate on our part because in launching a new method of doing DSR, we wanted to keep it at a broad enough level of abstraction to allow the actual application of the method to emerge in use. Mullarkey and Hevner's paper is an important contribution towards this emergence. Mullarkey and Hevner have elaborated the different ADR stages with specific activities for performing research tasks. As a result, they have made the ADR method more accessible to researchers. This is a substantive and important contribution to the discourse on not only ADR but also DSR in general.

Third, Mullarkey and Hevner offer a clear proposal on how to publish results from various phases of an ADR project. This is a consequence of incorporating reflection and formalization into every stage and adding an eighth principle – Abstraction. Because Sein et al. (2011) framed stage 3) “Reflection and Learning” as running parallel with stage 2) (BIE) along with feedback and iterations, continuous reflection is implied. Formalization, on the other hand is depicted as coming only at the end of an ADR project in Sein et al. (2011). This is clearly a shortcoming from individual researcher's point of view as new knowledge can be formalized and generalized outcomes emerge throughout the project. These outcomes can, and should, be disseminated to the research and project community. By making this vital change, Mullarkey and Hevner have indeed enhanced ADR. This shortcoming in the depiction of ADR by Sein et al. (2011) is not lost on us. Now, when we conduct seminars and workshops on ADR for researchers and practitioners, we present ADR as two nested loops, one containing stages 1-3 and the stage 2 (BIE) expanded as several cycles of building, intervention and evaluation. It should be also noted that BIE contains evaluation as part of it and there can be intermediate results published from it (see figure 1 below). This is important not only to ADR researchers, but design researchers in general, as it is useful to disseminate partial results during a possibly multi-year project throughout its duration. As noted in Baskerville et al. (2018) there are different types of possible publications from any given DSR project and for the researchers and practitioners alike. It is important for them to identify the different types of outlets (practitioner vs. academic etc.) where they will disseminate their knowledge (practitioner or academic) and to specify which of the different types of contributions they are making (artifact descriptions, design process descriptions, design rules, design theories and practical impact evaluations to name a few).

Figure 1: Building Intervention and Evaluation loops and outcomes

Disagreeing with Mullarkey and Hevner

We now come to the element of Mullarkey and Hevner's proposed enhancement of ADR with which we disagree, namely, multiple entry points. We have two crucial disagreements both of which are centered on the very essence of ADR. ADR's essential spirit is that there is one entry point to the cycle, namely, problem formulation. Let us present our conceptualization of a problem. A person may have an objective which we can call "the desired state". At that juncture, the person also has a "current state". If the desired state and the current state are not the same, meaning there is a gap between the two states, we have a problem. Problem solving is eliminating (or reducing) this gap. In the context of DSR, the desired state is always reached through the development or modification of an artifact, i.e. we want an artifact. If the current state is that we don't have an artifact, or we have one but it is not the artifact we want, then we have a problem. The knowledge generated in bridging this gap – moving from current state to the desired state – is done through design in DSR. (Of course, the problem may be solved not by going from current state to desired state but by simply making the current state into the desired state. In DSR parlance, this is a decision to not develop an artifact). Every entry point in Peffers et al. (2007) which is adopted by Mullarkey and Hevner thus represents a problem situation.

The other entry points are stages where a researcher chooses to enter an ADR project. For example, a researcher may want to understand the dynamics of interaction between researchers and practitioner in an ADR project. This is perfectly legitimate and a good interpretive study. That does not make this researcher an ADR researcher – she is not designing anything, nor is the artifact the focus of her research.

Let us look deeper into the other entry points:

- Objective centered: We fail to see how this can be an entry point because *every* ADR (and DSR for that matter) project has an objective. If we look closely at the 4 examples of Objective Centered entry point provided by Mullarkey and Hevner (in Appendix B), we can clearly see that all of them were problem driven.
- Development centered: While not to develop an artifact may be a decision made after a project is started (see our articulation of a problem above), *every* ADR, project develops some artifact. Should the decision be to not develop an artifact, the project retains the intervention element but has now morphed into an Action Research form. It is intriguing that one of the two examples of Development centered entry points provided by Mullarkey and Hevner is the very same example we used to illustrate ADR in Sein et al. (2011). Perhaps this can be attributed to either their misinterpretation of our example, or, more likely, the distinguishing ADR projects that have an existing artifact as the starting point as opposed to building an artifact from scratch. This was the case with the project that Mullarkey and Hevner conducted and later reflected on to build their arguments.
- Observation centered: It is incongruous to us how simply observing can be a design project! No wonder the two illustrations of this entry point provided by Mullarkey and Hevner are not design projects. Sherer et al. (2014) did not develop any artifact. Rather their paper is a conceptual one on how ADR is suitable for research in healthcare and is thus a scientific method paper. In their paper, Tanskanen et al. (2015) developed design principles from a qualitative study. Researchers doing good qualitative studies often induce frameworks, prepositions and even design principles. Design principles can be also developed from a literature review (e.g. Edzen and Sein 2016). That does not make such studies into an ADR or a DSR study. Furthermore, according to Peffers et al. (2007) the client/context-oriented solution can be **based on observing** a practical solution that worked. As per their description, this is retroactive application of the process model to a consulting problem. We can argue that in this case there should have been a clear problem centered entry.

In short, Mullarkey and Hevner have not made a convincing case for combining Peffers et al.'s (2007) framework with ADR. It appears to us that the main reason for this is based on the argument that projects have different entry points, which is a hallmark of the Peffers et al.'s model but is not a part of ADR. If we

go back to the AR roots of ADR, then every project is Problem Centered, and every project has just one entry point. The need to combine ADR with the Peffers et al. model consequently becomes moot. Peffers et al. is a well cited paper to conduct DSR projects taking a stage-gate perspective. The “enhanced ADR” form presented by Mullarkey and Hevner makes it into a linear stage-gate form of research, which goes against the very essence of ADR’s that the inquiry consists of nested loops. The artifact and the designer’s and user’s understanding of the artifact evolve through series of trials and their evaluation. The BIE cycles in ADR are such iterative loops.

This leads us to the heart of our disagreement with Mullarkey and Hevner: In combining ADR with the DSR form depicted in Peffers et al., they are combining two approaches that are epistemologically incommensurate. As we state above, ADR moved away from a stage-gate approach by encapsulating the core idea that there is an intervention into an organization during the research process, that provides the catalyst for a parallel reflection on the whole endeavor together by both the researchers and practitioners. In the process, the artifact emerges. ADR starts from a specific problem of a client organization and in the end try to connect it to a general problem. This is what Iivari (2015) describes as DSR strategy 2. The embedding of the design into the context, which is central to ADR, allows for reflection on the design and its goals (Schön 1984, Ågerfalk and Wiberg forthcoming). This furthermore takes the ADR practitioner away from the high-goddess mode (or Rorty’s God’s eye view (Rorty 1991)) of an almighty designer and forces them to pay close attention to the issues emerging from the local design context (e.g. the values of the stakeholders). While ADR does not explicitly advocate any specific design approach, it can be seen as bringing us towards a more participatory approach to design, reminiscent of the Scandinavian approach to design, where the researchers work in close co-operation with the reflective practitioners and end-users. In this approach, the goal is not just to design the artifact but also to improve practice (Ågerfalk and Wiberg, forthcoming). Thus ADR’s epistemology is primarily inductive (with stages of abductive reasoning especially when artifacts are evaluated). By contrast Peffers et al.’s (2007) model follows DSR strategy 1, which starts from a general class of problems, and derives a solution to it. This design approach is grounded in a positivistic deductive epistemology.

Implications

The epistemological incommensurateness between the DSR approach of Peffers and ADR, which we elaborated in the section above, has implications for the legitimation of knowledge claims for researchers following either process. We argue that most of the truly interesting design problems that we tackle are such that the solutions to them cannot be fully anticipated, but are partially designed and partially emergent from the practice. This makes ADR more appropriate for scholars who want to engage with

practitioners and co-produce knowledge in the very context where it will be used. Moreover, this approach steps away from what Rowe (2018:10) terms “solution replication” (“that a designed artifact will replicate its effects under certain conditions”) by explicitly ingraining the primacy of emergence. If a researcher has this knowledge interest, then the choice of the DSR approach is crucial. We argue that the embedding of the context in the design through intervention in an organization, a single entry point (problem centered), and, inductive epistemology, are characteristics of ADR that validate knowledge claims of emergent knowledge co-produced with practice. A multiple entry-point process where it is possible to bypass the context will undermine such a knowledge claim.

Conclusion

As we stated at the outset of this commentary, there is much to be gained from Mullarkey and Hevner’s ideas and thoughts. Their paper embodies the spirit of vigorous academic discourse and is a good contribution towards developing a cumulative tradition, at least in the context of DSR. Like them, we are adherents of pro-active research approaches and “learning by doing”, specifically by designing and thus posing challenges for the reality by reconstructing it. We both share a pragmatist philosophy, whereby to quote Ågerfalk (2010) we are “more interested in utility and usefulness than in an abstract notion of truth” (Ågerfalk 2010: 251) and “truth is embodied in practical outcome” (Baskerville et al., 2004: 331). Hevner et al.’s (2004) seminal paper legitimized this mode of knowledge creation and paved the way for methods such as articulated by Peffers et al.’s (2007) well-cited paper as well as ADR to be presented to the scholarly community. Where we differ is that Peffers et al. take Iivari’s strategy 1, while ADR takes strategy 2 and thus the two processes make different knowledge contributions. We believe that information systems discipline is better served by the kind of bottom-up design approach ingrained in ADR, where “action improves existence” (Goldkuhl 2004). This is in contrast to the designer-centered approach professed by Peffers et al. Yet, as Ågerfalk and Wiberg (forthcoming) state, echoing the panelists on whose opinions their paper is based on, bringing changes to make things better is possible through both approaches to DSR.

Mullarkey and Hevner’s paper reminds us that the discourse on DSR is an emergent process and periodic reflections are essential. More often than not, such reflections produce ideas that contribute to the advancement of the topic (in this case DSR in general and ADR in particular). There are times, however, when the ideas may take the process a few steps backwards.

In this commentary, we have tried to argue that Mullarkey and Hevner have done both in one paper. They have moved ADR closer to its AR roots by explicitly adding a Problem Diagnosis phase. At the same

time, they have moved ADR away from AR roots by proposing multiple entry points. Where we agree with them, we see steps forward. Where we disagree, we see steps backward. Whether it is more steps forward and fewer steps backwards, or vice versa, is for the research community to debate.

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