Action Design Research – Models for Researcher-Practitioner Collaboration

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Abstract. One essential characteristic of the Action Design Research (ADR) method is researcher-practitioner collaboration (RPC). The purpose of this paper is to present theoretical models for RPC collaboration in ADR projects. The models involve conditions, actions, and consequences concerning RPC challenges. A grounded theory approach was applied to identify the RPC challenges. The challenges were identified in a collaborative ADR project consisting of four researchers and nine organizations from the industry sector. The identified main challenges are: researcher intervention in practitioner contexts, reciprocal shaping between artifacts and design principles emerged from theory and practice, and researcher and practitioner learning. The contribution to practice, which consists of future ADR projects involving collaboration between researchers and practitioners, involves specific actions to be taken.

Keywords: Action-Design Research, ADR, Researcher-Practitioner Collaboration, Collaboration, Design Science Research.

1 Introduction

Design science research (DSR) is established as a widely accepted research approach in Information Systems (IS) (e.g., Gregor and Hevner, 2013; Vaishnavi and Kuechler, 2015). This fact has created a need for DSR methods (Cronholm and Göbel, 2019). One well-cited research method within DSR is Action Design Research (ADR) (Sein et al., 2011). One main characteristic of the ADR method is to respond to the dual mission of making theoretical contributions and assisting in solving the problems of practitioners (e.g., Sein et al., 2011). Moreover, Sein et al. (2011, p. 43) emphasize that “researchers bring their knowledge of theory and technological advances, while the practitioners bring practical hypotheses and knowledge of organizational work practices”. This collaborative aspect of the ADR method aims to increase the organizational relevance of the designed artifact and to encourage interaction between researchers and practitioners. The targeting of practitioners and the practitioners’ organizations means that several scholars regard the ADR method as a collaborative researcher-practitioner approach (e.g., Petersson and Lundberg, 2016; Haj-Bolouri et al., 2018; Göbel and Cronholm, 2018; Henriques and O’Neill, 2021).

As RPC is presented as a central dimension of the ADR method, it is surprising that the support for RPC only consists of a few sentences such as "Deciding the roles and scope for practitioner participation" and "A critical element is securing long-term commitment from the participating organization(s)" (Sein et al., p.40). The cooperative aspect of the ADR method requires guidance on researcher-practitioner collaboration (RPC) when it is used in research projects (Haj-Bolouri et al., 2018). Henriques and O'Neill (2021) state that RPC collaboration is paramount in design-oriented projects (such as research projects guided by the ADR method) in order to find the best solutions for socio-technical problems and that additional methods and approaches are required and welcome. In this paper, we refer to research projects guided by the ADR method as ADR projects. Based on our analysis of a collaborative ADR project, which we in this paper refer to as the ADR project, we argue that *the guidance concerning collaboration in the ADR method primarily responds to the question "why" and not "how" to collaborate* (see section 5). This means that there is a lack of prescriptive guidance on RPC. Therefore, the aim of this study is to present theoretical models for RPC collaboration in ADR projects. These models correspond to the theoretical contribution, and they involve relationships between conditions for challenges, actions taken to address challenges, and consequences of actions taken. In this study, we define a challenge as something that is regarded, either by researchers or practitioners, as a threat to successful collaboration. The contribution to practice, which are future ADR projects involving collaboration between researchers and practitioners, consists of specific actions that can be taken. Our research question reads: what RPC challenges can be identified in ADR projects?

Understanding issues related to RPC is a critical aspect of project planning, artifact design and evaluation, and learning. Therefore, we have analyzed an empirical research project guided by the ADR method. In the following section, we will present a literature review concerning RPC. Next, we will briefly describe the ADR method and the ADR project. After that, the research design is presented. Then, we will present our findings and theoretical models. Finally, conclusions will be drawn.

2 Literature Review

In order to find existing knowledge on RPC within ADR projects, we searched the Scopus database, which is the largest within information systems (IS). The keywords used were "Action Design Research" and "Researcher-Practitioner Collaboration". The search returned only six articles. Out of these six articles, three neither discussed collaboration nor ADR-projects, one reflected upon researcher-industry collaboration but not in ADR projects, and two involved reflections on researcher-practitioner collaboration in ADR projects. Therefore, we expanded our literature search to include backward reference searching, which meant that we reviewed relevant articles cited in the returned articles (i.e., snowball sampling, e.g., Naderifar et al., 2017). This expansion resulted in one more relevant article. The three articles that present knowledge about RPC in ADR projects are presented below.

Matzner et al. (2018) have suggested a conceptual framework for joint research projects. The framework can be regarded as an extension of ADR, and it involves both researchers' and business partners' interests. Moreover, the framework consists of a straightforward process involving the following phases: formulation of research needs, societal goals, political goals; formulations of research and business goals, design; analysis; development; full launch; and formulation of research and business outcomes.

Haj-Bolouri et al. (2018, p.11) present findings concerning how scholars engage with and use the ADR method. They have specifically identified three fundamental challenges concerning researcher-practitioner collaboration: (1) how to balance the competing interests of the organizational stakeholders with the interests of a research community; (2) how to balance the situated implementation of the designed IT-artifact for the practitioner needs against the research need of produce generalizable knowledge; and (3) how to balance the findings between specific and generalizable research outcomes.

Otto and Österle (2012) have identified principles for knowledge creation in collaborative DSR projects. The principles are developed for DSR in general and not specifically for ADR projects. However, we regard the ADR method as a part of the superior DSR concept. Otto and Österle (2012) state that collaborative forms of DSR require that knowledge be created across the boundaries of the research community and the practitioners' community. The main findings are six principles for knowledge creation in collaborative DSR: formalize shared goals, conduct full learning cycles, allow trial and error, make significant commitments, and involve complementary roles.

Based on the literature review, we can conclude that only a few articles present findings from RPC in ADR projects. Consequently, there is limited knowledge. In order to synthesize the literature review, we can conclude that only one of the articles is based on primary data while the others have collected data from other ADR researchers by using interviews or surveys. Another insight is that all the articles have developed models, principles, or challenges concerning RPC. Furthermore, the type of knowledge developed in the articles varies between descriptive, normative, and prescriptive. Nevertheless, we considered the identified articles as valuable input to our study. Our literature review can be criticized for being too limited. The reason for not involving other DSR approaches/methods such as Hevner et al. (2004) and Peffers et al. (2007) is that they are not explicitly stating that DSR is a collaborative researcher-practitioner approach. We argue that RPC is an essential quality of the ADR method, which can be derived from its recommendation to intervene in organizational contexts.

3 The RPC Project and the ADR Project

The purpose of the analyzed ADR project was to develop design principles and tools supporting organizations in their utilization of data to improve digital services. The ADR project involved four researchers and nine organizations in Sweden. The project was conducted over a period of three years. The industry sectors that the organizations represented were the automobile industry, telecommunications, and IT. The researchers consisted of two professors and two PhD students from the field of IS. The touchpoints between researchers and practitioners consisted of: a) project meetings, b) workshops including all the researchers and practitioners, and c) individual meetings between researchers and organizations.

The ADR project was guided by the ADR method. One purpose of the ADR method is to provide guidance for the building of artifacts shaped by the organizational context during development and use. The ADR method consists of four stages which are: (a) Problem Formulation (identify and conceptualize research opportunities based on existing theories and technologies), (b) Building, Intervention, and Evaluation (design and evaluate the artifact and articulate the design principles; (c) Reflection and Learning (move conceptually from building a solution for a particular instance to applying that learning to a broader class of problems), and (d) Formalization of Learning (formulate general solution concepts). Due to lack of space, we refer to Sein et al. (2011) for a detailed description of the ADR method.

At the end of the ADR project when several RPC challenges were addressed, we realized that it provided an excellent opportunity to analyze RPC. This meant that we identified RPC challenges in parallel with the fulfillment of the objectives of the ADR project. The ADR reasons for selecting this ADR project for analyzing RPC were: a) it consisted of frequent interactions between researchers and practitioners, b) it provided access to organizational settings and c) it provided access to rich data from intervention in nine organizations. The RPC challenges were identified and analyzed by two researchers who also participated in the ADR project. In this paper, we focus on the RPC challenges and actions taken to address the challenges.

4 Research Method

We applied the Grounded Theory Method (GTM) in order to identify and analyze RPC challenges. GTM is a qualitative research method that seeks to develop a theory grounded in systematically gathered and analyzed data (Goldkuhl and Cronholm, 2019). Urquhart et al. (2010) state that GTM "… has proved to be extremely useful in developing context-based, process-oriented descriptions and explanations of information systems phenomena" (p.358).

Strauss and Corbin (1998) distinguish between three coding steps in the use of GTM: (1) open coding, which is aimed at formulating categories based on analysis of concepts and attributes (i.e., circumstances in ADR project and actions taken), (2) axial coding, which is aimed at identifying relationships between categories and sub-categories in order to provide more complete explanations (i.e., relating specific circumstances to specific actions), (3) selective coding, which is aimed at integrating categories and refining theory (i.e., identifying the overall theme of this study). These three coding steps overlap and should not be interpreted as strictly sequential. During the steps, we analyzed: (a) notes taken from discussions among the researchers and practitioners during project meetings and workshops, (b) collaborative actions taken, and (c) project documentation. According to Strauss and Corbin (1998), identified categories could be logically structured according to an action-oriented paradigm consisting of three interrelated meta-categories: conditions, actions, and consequences. A condition defines a specific circumstance (e.g., a condition for a challenge to appear), an action/interaction describes something that occurs under particular circumstances (e.g., an action taken to address the challenge), and a consequence is a result that is dependent on the conditions and actions/interactions (e.g., consequences of the action taken to address the challenge). The use of meta-categories resulted in relationships between the categories, which were utilized when creating theoretical models.

5 Main Challenges

We have identified three main challenges in the ADR Project: researcher intervention in practitioner contexts, reciprocal shaping between reciprocal shaping between artifacts and design principles emerged from theory and practice, and researcher and practitioner learning. The formulation of the three main challenges is a result of integrating smaller units (sub-categories) into larger units (main categories). The description of each main challenge follows the order of the meta-categories. Each main challenge commences with a description of the conditions for the challenge identified in the ADR project, statements identified in the ADR method that are supposed to support ADR projects to manage the challenge, and explanations for why the ADR project is considered the ADR statements to be insufficient. After that, we present the actions undertaken in the ADR project to address the challenge. These actions were based on creative problem-solving discussions among researchers and practitioners in the ADR project and, to some extent, on guidance from the ADR method. Finally, we present the consequences of the action taken.

5.1 Challenge 1: Researcher Intervention in Practitioner Contexts

Conditions: Intervention is a core concept in the ADR method. Sein et al. (2011) state that learning from organizational contexts is imperative and requires comprehensive intervention in organizational settings. Moreover, Sein et al. (2011) argue that the ADR method simultaneously supports the building of innovative IT artifacts in an organizational context and learning from the intervention while addressing a problematic situation. These statements inform about, in an excellent way, *why* intervention is essential. Unfortunately, the ADR method does not inform about *how* intervention can be organized in ADR projects. In the ADR project, the intervention in organizational contexts consisted of evaluations of the tools for data utilization. Our analysis of the ADR project identified that the following actions were taken to support researcher intervention in practitioner contexts:

Action 1: Creation of a researcher-practitioner agreement. The ADR project formulated a researcher-practitioner agreement, which became the basis for a shared understanding of the purpose of the project. The agreement defined the roles and responsibilities of the researchers and the practitioners. Moreover, the agreement specified that evaluations of the tools for data utilization should be conducted in organizational contexts.

Action 2: Collaborative planning of intervention. In the ADR project, the researchers and practitioners planned all activities related to the intervention. This meant that project goals, activities, and schedules were jointly formulated. In order to fulfill the project goals, the ADR project was staffed by competencies of the researchers and the organizations that were of equal importance. The researchers contributed theoretical, methodical, and technical knowledge, while the practitioners contributed with organizational and technical knowledge.

Action 3: Viewing intervention as a tool for moving from the specific to the generic. Sein et al. (2011) explicitly suggest a move from the specific-and-unique to generic-and-abstract. Moreover, they describe three levels for this conceptual move: 1) generalization of the problem instance, 2) generalization of the solution instance, and 3) derivation of design principles from the project results. This means that the generalization of knowledge is a crucial component of the ADR method. In the ADR project, the intervention activities were regarded as a critical part of the generalization process since the purpose was to collect contextual data used for generalization in the forthcoming ADR-stage “Reflection and learning”.

Consequences: The consequences of the actions taken supported the engagement of the practitioners and their input throughout the ADR project. For example, the researcher-practitioner agreement, which explicitly defined the expectations of each project member, provided transparency and reduced vagueness. Moreover, the collaborative planning of intervention activities increased the incentives and motivation among the practitioners. It also strengthened the convergence of shared interests between the researcher and practitioners. Furthermore, the collection of contextual data was imperative in order to grasp each organization's contextual characteristics. The ADR project used these characteristics to generalize the solution instance (the tools for data utilization). The fact that intervention was regarded as an essential part of generalization created a better understanding of the ADR project as a research project.

Another identified consequence was that trust steadily increased between the researchers and practitioners due to the collaborative planning and their willingness to share valuable knowledge. We also identified that practitioners shared information between themselves and that this openness contributed to trust. A high level of trust was necessary since the researchers and the practitioners were dependent on each other’s inputs and efforts. The fact that the ADR project jointly designed and conducted interventions resulted in the researchers and practitioners continuously investing resources in the ADR project.

Our findings are supported by two statements from the practitioners which supported the consequences of the actions taken: “The project plan that included a description of the responsibilities of both parties made the expectations of each other more transparent” and “We appreciated the opportunity to evaluate the tool in our organization since it meant that we had a real impact on the development”.

5.2 Challenge 2: Reciprocal Shaping between Artifacts and Design Principles Emerged from Theory and Practice

Conditions: The second main challenge concerned the reciprocal shaping between the tools for data utilization (the artifacts) and the design principles. Reciprocity can be understood as a relationship of mutual dependence, action, or influence, and a mutual or cooperative interchange of favors between two parts (Gouldner, 1960). One fundamental advice of the ADR method is to respond to the dual mission of making theoretical contributions and assisting in solving the problems of practitioners (e.g., Sein et al., 2011). However, the ADR project found that the ADR method does not provide sufficient support concerning the dual mission. This was experienced as problematic since the primary interest of the researchers was to create general design knowledge about the development of tools for data utilization, while the primary interest of the practitioners was to develop tools that could help them exploit data to improve their services offered to customers. Inevitably, there were competing interests in the ADR project. Our analysis of the ADR project identified that the following action was taken to support the dual mission:

Action: Capitalizing on the mutual interests of researchers and practitioners. The ADR project discovered a *mutual dependency* between the development of the tools and design principles. The iterative development of the design principles followed the iterative development of the tools for data utilization. This meant that the feedback from evaluations conducted in the practitioners' organizations affected the design of the tools for data utilization and provided valuable knowledge to refine the design principles. The researchers and practitioners utilized this dependency for reciprocal shaping between the evolving tools and emerging design principles. Moreover, the evaluations also resulted in new needs for consulting theory, which the researchers did. This meant that both the formulation of the design principles and the development of the tools for data utilization were based on theoretical insights and empirical evidence. Our analysis of the reciprocal shaping is illustrated in figure 2.

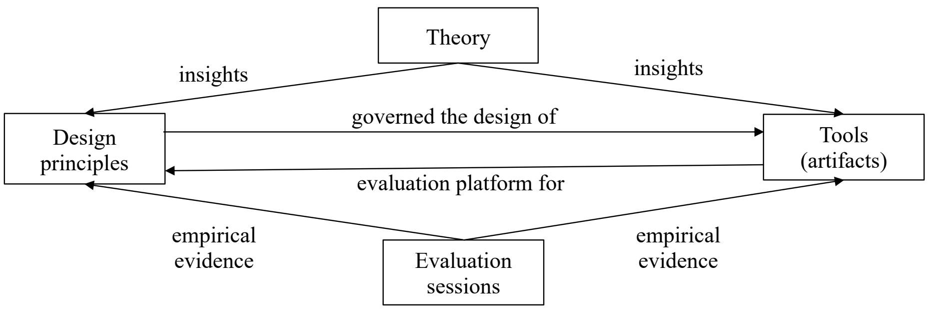

Fig. 2. Reciprocal shaping of design principles and the tools for data utilization.

The reciprocal shaping involved:

- The development of the tools was guided by the design principles that emerged during the iterations. This meant that the tools provided a platform for the evaluation of the design principles.

- The development of the design principles was guided by empirical feedback from the use of the tools. This meant that the advances of the design principles were used to shape the tools.

Consequences: The researchers and practitioners experienced an increased understanding of each other's interests. For example, shared insights were developed concerning the dependencies between the development of the design principles and the tools. These shared insights increased the acceptance towards solving both the scientific problem and the problem that existed in practice. A quote from one of the practitioners reads: "In the beginning of the project we were interested in tools for data utilization, but now we are equally interested in the design principles".

5.3 Challenge 3: Researcher and Practitioner Learning

Conditions: The third identified main challenge was how to enable learning for *both* researcher and practitioners. Sein et al. (2011, p.44) state that "the reflection and learning stage moves conceptually from building a solution for a particular instance to applying that learning to a broader class of problems". Moreover, Sein et al. (2011, p.44) state that "Conscious reflection on the problem framing, the theories chosen, and the emerging ensemble is critical to ensure that contributions to knowledge are identified". These statements are focusing on learning that concerns the researchers. The ADR project could not find much guidance in the ADR method that addresses learning for practitioners. In order to support commitment and motivation, the ADR project was organized to support learning for both researchers and practitioners.

Action 1: Joint formulation of individual and shared learning outcomes. The ADR project recognized that there existed both individual and shared interests between the researchers and the practitioners. Based on this insight, the ADR project organized joint workshops that aimed to identify relationships between project goals and learning outcomes.

Action 2: Implementation of mechanisms for promoting learning. The ADR project also implemented mechanisms for promoting learning. The ADR project organized two learning arenas: A) Dyadic researcher-practitioner meetings. One dyadic meeting meant that 1-2 researchers interacted with one organization (2-3 practitioners) at a time to jointly reflect on how the goals and learning outcomes were fulfilled in specific organizational contexts. B) Multi-organizational workshops. A multi-organizational workshop involved all the nine organizations and the researchers. The purpose was to implement a mechanism that promoted learning on a higher generalization level which involved the overall project goals and learning outcomes. Finally, the companies were invited to present learning outcomes at several occasions.

Action 3: Joint formalization of learning. This action aimed to enable the integration of both researcher and practitioner aspects in written and oral communication of project results. The formalization of learning involved a) joint publishing of scientific papers, b) joint publishing of technical papers addressing practitioner fora, and c) joint presentations of project results to the practitioners' organizations.

Consequences: One consequence of the dyadic researcher-practitioner meetings resulted in mutual learning among researchers and practitioners. The researchers learned from the practitioners' application of the tools in their organizational contexts, and the practitioners learned how the tools could support them to improve services offered to customers. However, the learning from the dyadic meetings was highly contextual.

Another consequence regarding the multi-organizational workshops was that they supported the generalization of contextual knowledge gained from the dyadic meetings. As mentioned above, contextual results were used as input to "move from the specific-and-unique to generic-and-abstract". The involvement of all the organizations in the multi-organizational workshops also meant that they learned from each other by sharing business knowledge. This learning included new knowledge on service strategies, processes based on data analysis, customer relationship management, and new ideas for services that could be offered. A quote from one of the practitioners reads: "One reason to participate in the project is to interact and learn from other organizations".

6 Theoretical Models

Glaser and Strauss (2017) state that a substantive theory emerges from the conceptual categories grounded in the data. A substantive theory is developed for a real empirical domain, which in our case is collaborative ADR projects. In order to present a substantive theory for RPC challenges in ADR projects, we have developed four theoretical models. As mentioned in section 4, the structure of the theoretical models followed the action-oriented paradigm consisting of three meta-categories: conditions, actions, and consequences (see Fig. 3-5).

In order to explain how to interpret the models, we provide an example. The example is from Fig. 4 describing the challenge "Reciprocal shaping between artifacts and design principles emerged from theory and practice": a) the conditions inform about existing circumstances (e.g., competing interests), b) the actions taken inform about what arrangements can be made to address the challenges (e.g., creation of a research design that allowed for reciprocal shaping of the artifact and design principles), and c) the consequences inform about what happened when the actions were taken (e.g., researchers and practitioners experienced an increased understanding of each other's interests).

In the next step, we identified the overarching category that integrated the three challenges. The overarching category was formulated as follows: RPC challenges in ADR projects, which corresponds to the central theme of our study (see Fig. 6). Our analysis of the main challenges resulted in that the first one, "Researcher intervention in practitioner contexts", was regarded as a *condition* for the other two main challenges since it constitutes a crucial point of departure for RPC. The second main category, "Reciprocal shaping between artifacts and design principles emerged from theory and practice", is regarded as an *action/interaction* since it constitutes a primary concern for RPC and is affected by the main challenge "Researcher intervention in practitioner contexts". The third main challenge, "Researcher and practitioner learning", is considered a *consequence* since the likelihood of learning will increase if the first and second main challenges are addressed. Vice versa, learning will probably be obstructed if ADR projects fail to manage the first and second main challenges. Finally, we checked logical errors in order to ensure consistency and coherency within and between the models.

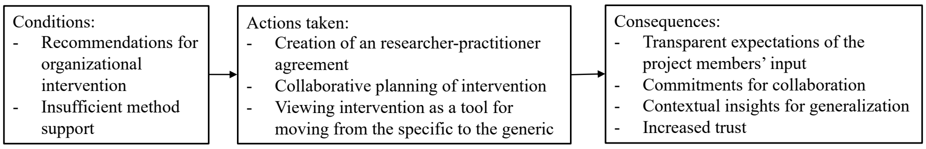

Fig. 3. Model for researcher intervention in practitioner contexts.

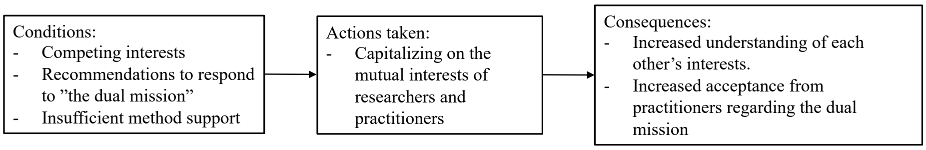

Fig. 4. Model for reciprocal shaping between artifacts and design principles emerged from theory and practice.

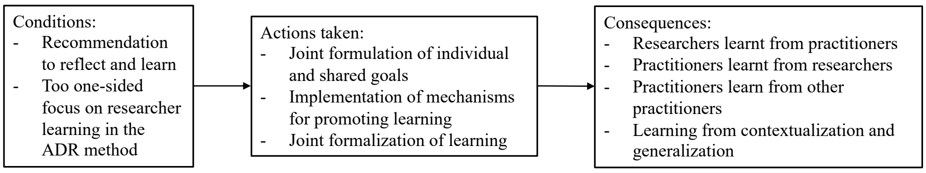

Fig. 5. Model for researcher and practitioner learning.

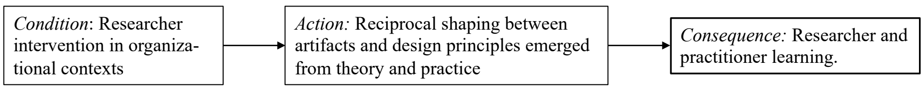

Fig. 6. The overarching theme: RPC challenges in ADR projects

7 Discussion

Based on an analysis of the empirical ADR project, we found that there initially was a rift between the interests of the researchers and practitioners, the collaboration was more difficult in practice than on the paper, and the ADR method primarily responded to the question "why to collaborate" and not "how to collaborate". These observations required extended support for RPC when using the ADR method. As mentioned in section 1, the RPC support from the ADR method is limited. A comparison of our results with both the ADR method and the literature review reveals that our theoretical models extend prior knowledge about RPC in ADR projects by: a) presenting explicit categories regarded as either conditions, actions, or consequences, and b) explaining logical relationships between conditions, actions, and consequences.

Furthermore, it can be argued that the theoretical models are not specific to ADR projects but to RPC in general. However, we argue that these models are essential to managing ADR projects because they correspond to one primary characteristic: "The [ADR] method conceptualizes the research process as containing the inseparable and inherently interwoven activities of building the IT artifact, intervening in the organization, and evaluating it concurrently" (Sein et al., 2011, p.37). This recommendation, as a whole, is not prominent in other DSR approaches/methods. However, we cannot foresee any barriers for them to be considered in future collaborative ADR projects, DSR projects, or general IS projects that are building artifacts.

8 Conclusion

In section 1, we stated that support for collaboration in the ADR method primarily responds to the question "why" and not "how" to collaborate. Therefore, the aim of this study was to present theoretical models for RPC collaboration in ADR projects involving support for prescriptive actions. We have identified three main challenges concerning RPC: researcher intervention in practitioner contexts, reciprocal shaping between artifacts and design principles emerged from theory and practice, and researcher and practitioner learning. The knowledge contribution to practice consists of explicit actions that can be taken to address collaboration challenges experienced in ADR projects. In this case, the practice consists of ADR projects facing RPC challenges. We can conclude that the actions taken supported the ADR project to manage the identified challenges. The knowledge contribution to theory consists of theoretical models.

Our conclusions are based on findings from one empirical study. The problem of the generalization of findings in qualitative studies is a well-known challenge. In order to support the reuse of the findings in this study, we have provided transparent descriptions of the conditions, actions, and consequences. Therefore, we hope that our models will be considered in future ADR projects. However, we recognize that some adjustments may be needed due to the contextual characteristics of the ADR method. Therefore, to further evaluate the theoretical models created in this study, we suggest that they are evaluated in future projects concerning RPC.

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