

# Using Action Design Research for Co-creating Service-Dominant Business Artifacts between Academia and Industry

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**Abstract.** Our project started as an innovation initiative for shaping the future of an international Dutch conglomerate in the financial services industry. This endeavor took the shape of a collaboration between academics and practitioners that evolved from unique goals for industry as fast results and real scientific results towards a collaborative approach. We formalized this collaboration by using action design research (ADR) for achieving impact within the company while generating new knowledge. The use of ADR resulted in the co-creation of artifacts that brought mutual benefits, resulting in a win-win situation for the academia and industry. On the one hand, academics were able to develop a framework and its underlying artifacts for service-dominant business design and engineering. On the other hand, the framework helped to achieve organizational change for shifting from an asset-dominant business towards a service-dominant one.

**Keywords:** Action Design Research · Service-Dominant Logic · Service-Dominant Business Model Radar · Service-Dominant Business Engineering

## 1 Introduction

Collaboration between academics and practitioners is becoming increasingly important because this interaction can generate reciprocal benefits for all parties involved [25]. Practitioners from industry obtain access to scientific competence, and scientists, in exchange, learn about the industry’s needs and interests [8]. From our experience, in our industry-academy collaboration, there are expectation challenges between practitioners and researchers: On the practitioner’s side, there is an urgency of rapid results for achieving a return on investment within the company. On the academic side, there is a goal of delivering academic results by performing research that requires time and effort. Therefore, there is a challenge to balance both sides of the project collaboration: Achieving impact within the company, with the generation of new academic knowledge. However, balance is usually not well established from the beginning of the project, specifically, for a long-term PhD project like ours. In particular, for satisfying the

needs of a Dutch conglomerate in financial services for researching about growing opportunities by the design of new business models driven by information systems [9].

Our project, named originally as CoProFind (contract-based process outsourcing in the Financial Services industry), was initiated by a former chief executive officer for facing the future challenges driven by the rapid market changes. A committee conformed by academic researchers of the university and executives of the Dutch conglomerate recruited a PhD candidate with professional experience with the ability to think outside-the-box. Hence, the project team was conformed and started the journey of our project.

In this paper, we further explore our collaboration challenges, experience, and gains. In particular, we discuss our shift from researcher-driven design research towards a collaborative action design research approach. With this research approach, we were able to produce a framework that achieved organizational change while generating academic knowledge.

This paper is structured as follows: In Section 2, we explain how the collaboration took form. In Section 3, we discuss our collaboration challenges and learned lessons. In Section 4, we describe the criteria for selecting the research method. In Section 5, we describe good practices of the selected collaborative research method: Action Design Research. In Section 6, we discuss the result of applying the collaborative research approach in the Dutch conglomerate. Finally, we end this paper with conclusions.

## 2 How the Collaboration took Form

During the first year, the PhD candidate researched the solution space: Innovations within financial services. In this first step, the PhD candidate identified the importance of business model innovation and brought the company the use of visual representations for communicating business models [10].

As the next step, we developed a framework for establishing business innovation directions (BID). As presented in [17], the BID framework has four dimensions: Logic, openness, competitiveness, and newness. From these four dimensions, we focus our attention in this paper on the logic dimension. This logic dimension has two possible values: Goods-dominant or service-dominant. A goods-dominant logic implies a traditional focus on products and value chains with a manufacturer mindset. In this goods-dominant logic [24], each link of the value chain adds value for producing products and offering adding value services for such products. This logic has a focus on value-in-ownership, and the consumer plays a passive role by being a receptor of a product produced by the firm. The service-dominant logic focuses on solutions: the value-in-use instead of value-in-ownership. This value-in-use is co-created within a value network or ecosystem. In this logic, all the business actors participate actively in the co-creation process [24].

In the information systems (IS) group from the Dutch University, we designed business models by following a goods-dominant perspective that is heavily asset

oriented like FLAME. We also designed business models by following a service-dominant perspective, like Servestment. The PhD candidate led the development of the Servestment business concept, a crowd-funding finance platform for service providers by selling tokens for service delivery [11]. The practitioners from the company decided that business concepts that followed the service-logic perspective were the most innovative ones. Furthermore, they manifested interest in designing a business by following this way of thinking: The practice inspired problem.

### 3 Challenges and Learned Lessons

During our project, we faced challenges in the co-operation between academics and practitioners. We conceptualize them as follows:

**Consultant trap.** There is a conflict between rapid results and methodological academic rigors required for academic contributions. Practitioners want rapid results like a consultancy, resulting in a challenging environment.

**High revenue trap.** Financial success for a high-income earner conglomerate can slow the progress down due to the lack of urgency on developing new concepts as a result of increasing financial performance.

**Artifact acceptance.** Balancing usable and understandable artifacts driven by novel theory, new jargon, and new ways of doing things.

Due to the challenging collaboration, we were able to learn valuable lessons. We describe them as follows:

**Identify the practitioner’s needs.** Do not start with solutions before knowing the problem. We started the project with e-contracting technologies. However, after we starting working together with practitioners, we were able to find the real needs for bringing benefits to the company and the university.

**Inclusive instead of exclusive.** Include the industry side in the artifact development process. The collaboration was successful because the interaction between academics and practitioners helped to reduce the knowledge gap between them. Academics gained insights from practitioners, and practitioners gained state-of-the-art knowledge from academics.

**Associate with industry partners.** Middle management can offer access to resources on the industry’s side. An innovator manager was essential in the company side for facilitating workshops, giving feedback, and spreading the new artifacts within the organization. Usually, senior managers have less time and energy to focus on non-urgent tasks like a research project.

**Artifact co-creation.** The project meetings and workshops enabled practitioners to collaborate. They brought valuable insights and to establish a reality check of the tool in the real business environment.

**Convince with evidence.** Proofs for following a specific research direction are essential for practitioners and academics. Proofs are particularly useful when the PhD candidate is new to the organizations involved in the project or even new in the country. The attendance to a workshop at the University of Cambridge

helped to convince the practitioners and then academics to solve the practice-inspired business design problem by developing the service-dominant business framework.

**Keep it simple but complete.** Artifacts can not be too complicated or too simple. Finding the right balance is achieved with the interaction between academic practitioners and end-users.

**Inside-out.** The PhD candidate worked as a staff member within the university and also spent time working within the conglomerate. This configuration helped to bring academics and practitioners closer and also influenced on reducing the knowledge gap by constant interaction and exchange.

## 4 Finding the Right Balance between Action and Design Science Research

In our project, we started with design science research (DSR): A well-known research method for developing artifacts grounded in academic theory. However, in DSR, the involvement of end-users occurs only during the evaluation, once the artifact is already wholly developed [7].

We experienced that by using DSR alone, our artifacts were not well received. Then, the PhD candidate looked at Action Research (AR)[3] for making an impact within the company [12]. AR [4] is an iterative research method where researchers intervene in the real world to solve practitioners' problems and to gain scientific knowledge [2]. This research method is usually performed as an iterative process and combines theory generation with researcher intervention for solving an immediate organization problem [27]. However, it lacks the artifact development process from DSR.

Therefore, we ask ourselves the following question: How can we construct artifacts with organizational impact and academic quality? Our collaboration shifted from researcher only driven artifact development towards a collaborative approach between academics and practitioners. The collaboration between academics and researchers required the adoption of a new research approach within the IS group. Our research aimed to achieve the dual goal of creating academic knowledge and solving practitioners' problems. AR was a method taught in the Netherlands research school for information and knowledge systems (SIKS), where the PhD candidate attended. However, the PhD candidate found in the IS literature a new kind of research method not taught at SIKS called to combine DS with AR: Action Design Research (ADR) [27]. ADR [27] has emerged as a new design research method that combines DSR with AR to focus clearly on artifact development while taking into consideration user participation and feedback during the experimentation.

We applied ADR successfully in our research project because the method combines design research with action research for achieving a dual goal of organizational impact and knowledge generation: Mutual benefits for practitioners and researchers. This co-creative approach to performing research balanced the

development of new artifacts with an organizational impact: A shift towards a service-dominant business, from a goods-dominant one.

## 5 Action Design Research Best Practices for Co-creating Artifacts between Academia and Industry

In this section, we present good practices for performing an action design research (ADR) process. We describe the good practices of the ADR process as the following stages [27]:

**ADR Stage 1: Problem formulation.** In this stage, we identify and conceptualize a research opportunity based on existing theories. Two principles drive this stage: Principle 1, practice-inspired research; and, principle 2, Theory-ingrained artifact. The former emphasizes viewing problems as knowledge-creation opportunities. The later, emphasize that theories inform artifacts that are created and evaluated within ADR.

**ADR Stage 2: Building, intervention, and evaluation (BIE).** In this stage, we use the problem and theoretical foundation for artifact development. Three principles drive this stage: Principle 3, reciprocal shaping: states that an ADR team formed by academics and practitioners engage in the artifact iterative process. Principle 4, mutually influential roles: Stress the importance of mutual learning from the participants within the ADR process. Finally, principle 5, authentic and concurrent evaluation: Emphasizes that evaluation is not a separate stage of the research process that follows building. In ADR, the artifact development process is iterative: First, we present a researcher-driven version to the practitioners: The alpha version. This one or more alpha versions are formative for refining the artifact. Then, the practitioners contribute to feedback. The captured feedback is processed by academics, resulting in one or more beta versions of the artifact. We use the beta versions with end-users in workshop settings. In this beta version, we assess the value and utility of the outcomes.

**ADR Stage 3: Reflection and learning.** In this stage, we reflect on the development process from building a particular solution to a broader class of problems. The resulting artifact, also known as the ensemble, will reflect not only the original design but also the practitioner’s perspectives within the organizational use. This stage works in parallel with Stage 1 and Stage 2.

**ADR Stage 4: Formalization of learning.** In this stage, we formalize the outcome as a tool for solving a class of problems. Generalized outcomes drive this stage: Principle 7. The resulting artifact or ensemble is, by definition, a solution to address a problem that can be generalized.

## 6 Using ADR for Developing the Framework and its Underlying Artifacts

In this section, we describe how we applied ADR for developing the framework artifact and two underlying artifacts: The service-dominant strategy canvas

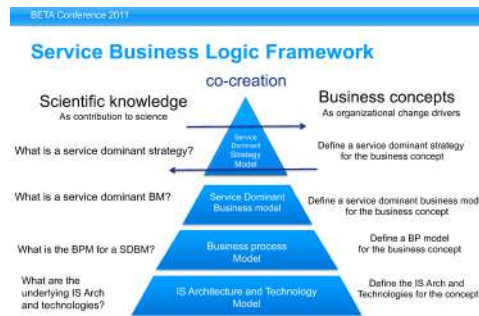
and service-dominant business model radar (In a few words, the business model radar).

## 6.1 Service-dominant Business Framework as the Overall View Artifact

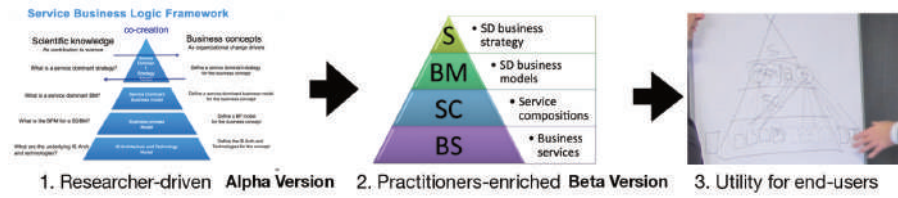
By following ADR stage 1, we started the development of the service-dominant business framework for solving a practical problem: How to design businesses by following a service-dominant mindset. By following the ADR stage 1, the PhD candidate identified the theory behind: The link between strategy, business models, and business processes [26] [1].

The PhD candidate proposed the development of a service-logic driven framework as a foundation for his PhD thesis. However, the practitioners required confirmation of the service trend for going in this direction. The PhD candidate proposed to attend a service design and innovation workshop at the Institute for Manufacturing (IfM) at the University of Cambridge. The company showed interest in the research direction by sending an innovation manager to join the workshop with the PhD candidate. The innovation manager confirmed in practice the research direction on the service-dominant logic established by the PhD candidate, and the executives were eager to continue in this direction. As a result, the innovation manager supported the PhD candidate for developing a framework following a service-logic: The innovation manager and the PhD candidate sent a memo to the upper management for applying this framework in the company [5]. Then, due to the interest of the company in this direction, the IS group allowed the development of the framework as PhD thesis [14].

In Figure 2, we present the evolution of the iterative construction process that shaped the artifact. By following ADR stage 2, the framework evolved from an alpha version proposed by the PhD candidate [12] to a beta version (first presented in [20]) that included the feedback from academics and practitioners [6], [14]. The original alpha framework shown in Figure 1, includes from top



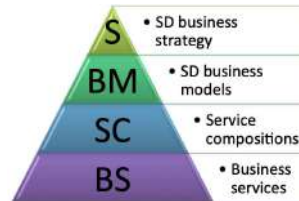
**Fig. 1.** The service business Logic framework [12]: The alpha service-dominant business. Proposed to the Dutch conglomerate in [5].



**Fig. 2.** Service-dominant business framework development with action design research

to bottom: Service-dominant strategy model, service-dominant business model, business process model, and IS architecture and technology model. The PhD candidate defined the last layer at that time concerning the company's desire to implement business models. As shown in Figure 3, the artifact evolved into a business-only because our users were business executives: The beta version. This version was a result of ADR stage 3 by reflecting on the evolving practitioners' business needs. Hence, this updated the design principles and resulted in the service-dominant business framework with strategy formulation, business model design, and business process compositions with business services. In Figure 2, in the end, we show how business-oriented practitioners interacted with the framework during one of our workshops within the Dutch conglomerate.

As suggested by ADR stage 4, the framework can solve a class of problems in designing service-dominant business models. For instance, for modelling business adopting Industry 4.0 [15]. Furthermore, the framework guided the development of the underlying artifacts. In the service-dominant strategy layer, we have the service-dominant strategy canvas. In the service-dominant business model layer, we have the business model radar. At the bottom two layers, the service composition and business services, we used concepts with less novelty. At the business services layer, we used the concept of a business service catalog inspired in the service-oriented architecture and applied at the business level. At the business service composition layer, we use the concepts of service blueprints and business processes for illustrating the idea of using a business service catalog.



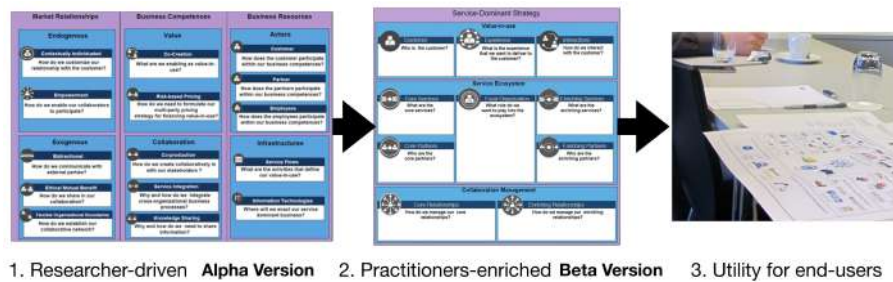
**Fig. 3.** Service-Dominant Business Framework [20]

## 6.2 Service-dominant Strategy Artifact

The first practical problem was how to formulate a service-dominant strategy. The PhD candidate reviewed the literature regarding the service-dominant logic theory and its strategic development [13]. This theory ingrained the design of an academic version of the strategy canvas: The alpha artifact [21].

As stated by ADR stage 2, we used the alpha version with the practitioners [22]. However, the jargon was too complicated. For instance, we used categories such as exogenous and endogenous. Then, we constructed the practitioner a user-focused version: The beta version [19]. In Figure 6, we show the service-dominant strategy canvas artifact: from the alpha version to the utility for the users in the last version. We tested the beta version in a workshop setting with executives from the conglomerate. During the workshop, we used an interactive approach with sticky notes and a poster version of the tool for enabling the collaboration. At first, when we started to use the elements, the executives were not too collaborative. However, after ten minutes with the tool, we were able to interact with the practitioners. By following ADR stage 3, we reflected on the workshop experience. As a lesson, we learned that the interactive poster with sticky notes approaches worked well with end-users, and we decided to use this approach with the remaining artifacts.

By following ADR stage 4, we have the service-dominant strategy canvas with four categories as a generalized outcome: The value-in-use, the service ecosystem, and collaboration management. From the first category, the executives shifted their thinking from car leasing towards mobility solutions. From the second category, the executives defined their role within an ecosystem of service partners: The orchestrator. Finally, they identified the kind of partnership for playing this role. By following ADR stage 4, we can generalize the outcomes of the tool. Practitioners can not only design an orchestrating strategy but also identify other roles that could lead to different types of business models



**Fig. 4.** service-dominant strategy canvas artifact evolution: From the researchers driven Alpha version to the utility for end-users in a workshop session from the practitioners-enriched Beta version



### 6.3 The Service-dominant Business Model Artifact: The Business Model Radar

As stated by ADR stage 1, a practical problem drove the research: The need for designing solution-based business models derived from the adoption of a service-dominant strategy. In particular, as we identified in the strategic workshop session: The design of a mobility business model by playing the role of orchestrator. The PhD candidate identified the theory for developing the service-dominant business model artifact: The business model canvas that contains the elements of a traditional business model and the service-dominant strategy that contains the elements of a service-dominant mindset [20], [14].

By following ADR stage 2, the PhD candidate developed the first business model radar (BMR) artifact by confronting the elements of the business model canvas with the elements of the service-dominant logic [20], [14]: the alpha artifact. We discussed the version in working meetings with the ADR team. However, the first goal was to test the circular shape of the service-dominant business model tool. The BMR has a circular shape for emphasizing the co-creation process due to the adoption of a value network structure. Once the ADR team accepted the PhD candidate argument of doing a circular-based representation on the tool, he produced a second alpha version by improving the confrontation process between the theoretical elements [18].

During our work on the BMR by following ADR Stage 2 (BIE), the practitioners influenced on the practicality and usability of the business model tool and the academics with the theory and the artifact: Achieving mutually influential roles (principle 4). The BMR alpha artifact versions were evaluated internally within the ADR team by following the principle 3 (reciprocal shaping) and then with the beta version we tested with a broader audience in a workshop setting [14]. In Figure 5, we present the evolution of BMR as an iterative development process: From the alpha version to the utility for the users in the last version.

As shown in Figure 5, the complexity increased as the BMR evolves. The increase in complexity is explained by discussing with practitioners and by updating our design principles. At first, there was not an explicit separation between costs and benefits because one senior manager insisted that he does not care about the benefits of the other parties involved in the business model. However,

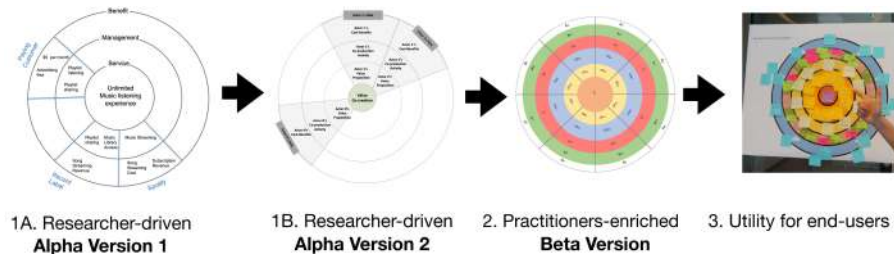


Fig. 5. ADR development process for the service-dominant business model radar

this was a particular aspect that hinders the artifact as a solution for a class of problems.

By following ADR stage 3 on reflection and learning, the PhD candidate reflected on this issue and established a beta version of the BMR by including an explicit separation of cost-benefits to emphasize the business model aspect of the BMR. In this way, the end-users have to think about the costs and the benefits for each party involved. During the workshops, the BMR tool achieved the goal of designing a business model within the conglomerate: A mobility orchestrator business model. For instance, during a workshop with end-users from the conglomerate, a participant expressed “it provides a bird’s eye view on the designed business model”.

As stated by ADR stage 4, we formalize the outcome: A service-dominant business model is the reframing of the business model concept by following a service-dominant strategy. This concept takes shape as a conceptual modeling tool for business model design: The business model radar. The business model radar takes a value network organizational structure where each co-creation actor contributes to the overall solution with value propositions. For delivering a value proposition, each actor must perform a co-creation activity. By participating in the business model, a co-creation actor can incur in costs and gain benefits.

Practitioners and academics can use the BMR for designing business models as ecosystems beyond mobility business models [16]. The former PhD candidate has tested this in business model innovation workshops in Austria and international lectures about business models with students from universities from Finland, Germany, Indonesia, and Austria.

## 7 Conclusions

The main result of the project is the service-dominant business design framework. This framework acted as the first dimension of the BASE/X (Business Agility through Service Engineering in an eXtended enterprise) framework [6]. The BASE/X is currently active research in the IS group. The framework covers the spectrum of the formulation of service-dominant business strategies to the process-based execution of business services.

Our project produced academic impact by the use of the framework and the tools. For instance, the service-dominant business model radar, developed in [14], [20] and [20] and applied in mobility solutions [20], has been used in a mobility project conducted by the IS group at the School of Industrial Engineering in Eindhoven University of Technology: C-MobILE (Accelerating C-ITS Mobility Innovation and deployment in Europe). The BMR has been also applied in regional projects in Austria [23] and interregional projects between Austria and Slovenia [15], [16]. Regarding the business impact, the organization shifted towards financial solutions by including consultancy services on servitization and a mobility business model.

The ADR method proved in our project to be the right research approach for collaborating with the industry by co-creating solutions rather than just



**Fig. 6.** BASE/X (Business Agility through Service Engineering in an eXtended enterprise) [6]

delivering them. By including the practitioner in the research, we were able to minimize the gaps in domain-specific knowledge. Furthermore, the company executives accepted and used the resulting artifact for defining a new direction of doing business.

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