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## Exploring Boundary Objects in Creative Projects: An Investigation of a Multi-Stakeholder Collaboration

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**Abstract:** As more and more organizations are reaching the limits of their internal innovation performance, they are increasingly forced to seek external innovation opportunities through inter-organizational collaboration forms, such as creative projects. These collaborations require both efficient and effective forms of communication since a common understanding is required for success. Differences in knowledge backgrounds hinder the collaboration of multiple stakeholder groups by making knowledge integration difficult, especially when they collaborate for the first time. Boundary objects are attributed a mediating capability. While design artifacts are often used to facilitate communication, their value in promoting multi-stakeholder collaboration is not yet fully understood. Addressing the gap, we analyze when artifacts turn into boundary objects and how they promote interaction between stakeholder groups. Building on the results of an in-depth case-study, we illustrate the insights that boundary objects provide for stakeholder integration. After discussing these insights, we outline directions for future research and practice.

**Keywords:** Creative Projects; Boundary Objects; Temporal Organization; Networked Organization; Project-based Organization; Inter-organizational Collaboration; Multi-stakeholder Perspective; Design Artefacts

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### 1 Introduction

Despite large investments in their internal research and development departments to generate new products and services, companies are reaching their limits of internal innovation capacity (Vanhaverbeke, 2006). With the rising complexity of products and services

as well as the increasingly sophisticated demands of customers, companies have difficulties handling these undertakings by themselves (Fetterhoff & Voelkel, 2006). They are often forced to look for external innovation opportunities, resulting in increased inter-organizational collaborations (Slowinski et al., 2009). Thus, today's work is largely completed in forms of collaborations made up of interdependent and multiple stakeholders (Bechky, 2006).

Temporary organizations are formed that bring together a diverse set of stakeholders with diverging skills to work interdependently on complex problem scenarios (Goodman & Goodman, 1976). Enabling effective collaboration and knowledge sharing between the multiple stakeholder groups is considered a pressing challenge (Carlile, 2002; Kimble et al., 2010). The construct of creative projects (CPs) illustrates how different people and organizations get together to create something new. The construct aims to explain how organizations get things started and how they achieve their set goals (Obstfeld, 2012). Furthermore, as these individual organizations need to form a common understanding by bridging and sharing their respective knowledge with one another, the necessity of effective communication becomes apparent (Paulraj et al., 2008).

Boundary objects (BOs) play an important role in bridging knowledge domains. The concept of BOs (Star & Griesemer, 1989) describes an entity (i.e., abstract or physical artefact) that facilitates communication and understanding among different communities of practice by providing a common reference point (Wenger, 2000). While design artefacts are often used to facilitate communication their value and usage in CPs is still unclear. In particular, a longer observation period is required (Gerling et al., 2020; Huber et al., 2020). To address that gap, our research combines the concepts of CPs and BOs to identify the boundary spanning capabilities of the utilized objects and gaining a holistic understanding of when and how they can contribute to overcoming the challenges that multi-stakeholder collaborations are presented with. As such, our research questions are:

***RQ1:** When are boundary objects used to overcome challenges of creative projects?*

***RQ2:** In what way do boundary objects contribute to overcome these challenges?*

To better understand the phenomenon of CPs, its challenge, and the boundary spanning capacity of artefacts, we ground our research in an in-depth single-case study (Yin, 2003) of Swissify, a Swiss-based collaboration between four different stakeholders developing a digital platform over the course of approximately 12 months. For a holistic view, the perspectives of all four stakeholders were included regarding their individual analysis of the collaboration. In total, seven semi-structured interviews were conducted to understand the impact (how) of the BOs on the interaction between the stakeholder groups involved in the projects. The insights are compared with the documents and the card sorting results to determine the time (when) by applying an open iterative coding process.

By applying the concept of BOs and introducing it to the construct of CPs, we (a) identify a set of challenges that are linked to CPs taking into account the time of occurrence, and (b) analyze how BOs, regarding their knowledge transfer capabilities, can effectively support the overcoming of the identified challenges. Grounding on the previous aspects, we outline our paper as follows. First, we begin with the conceptual background of CPs and BOs in context of multi-stakeholder collaboration. After elevating the results, according to the above-mentioned research objectives, we discuss the insights and limitations of our research. We conclude with implications for future research and managerial action, taking that our work offers for understanding collaborative work.

## 2 Conceptual Background

### *Creative Projects*

The construct of creative projects (CPs), as it is used in the context of our research, captures the non-routine aspect of creating something new as part of new forms of organizing (Puranam et al., 2014). Firstly, the term “creative” in this construct does not necessarily imply aspects that are conventionally regarded as being creative such as art, design and music but rather the act of being innovative, signifying a non-repetitive project form, and bringing about something new into life (Walfisz et al., 2006).

While CPs do have similarities with project-based organizations (Sydow et al., 2004), garbage can models (Cohen et al., 1972), and temporary organizations (Turner & Müller, 2003) regarding their temporary existence and flexibility of tasks, CPs differ in aspects. While most projects entail a degree of creativity, it is the degree of creativity rather than the type that distinguishes them (Paletz, 2012). As such, they offer insights into the achievement of organizational change and innovation (Obstfeld, 2012). CPs take a closer look at mechanisms of initiating and achieving novel processes (Obstfeld, 2012). Through a envisioned end-state, their primary goal is to introduce change into organizations and their social contexts, with the integration of new technologies, organizational restructuring or any significant modification to the status quo (Gillier et al., 2015). The actors within a CP aim to explore broad innovation fields which allows changes to the organization and their routines. They are less concerned with the development of new commercial services or products (Gillier et al., 2015). As a result of engaging in non-routine activities, the complexity rises and creates high uncertainty (Paletz, 2012).

Further, CPs are composed of multiple heterogeneous actors from diverse areas of expertise and incorporate a range of tasks and skills (Paris & Ben Mahmoud-Jouini, 2019). The pluralistic nature of these teams aims to generate a multitude of ideas due to the variety of knowledge, assumptions and problem-solving approaches that each actor contributes (Skilton & Dooley, 2010). These teams exhibit inherent attributes of perpetual learning, sharing of collective knowledge and continuous challenging each other (Simon, 2006). Being conducted “de novo” (Obstfeld, 2012, p. 1573), the definition of the underlying problems, solutions and goals as well as the team compositions regarding their roles and responsibilities remains vague at their inception (Skilton & Dooley, 2010). Due to the unpredictability, ambiguity and limited guidance, extensive interactions within the community are required to overcome the impending challenges (Bakker et al., 2013).

In summary, we conceptualize CPs as temporary groups of pluralistic actors, that aim to introduce change into organizations through the means of explorative efforts, collective knowledge sharing, and integration of new components. Due to their pronounced boundary spanning capabilities, BOs provide a valuable contribution here.

### *Boundary Objects*

Knowledge is a critical success factor for organizations and as such the efficiency and effectiveness of its management (Nonaka, 1994). The transfer, sharing and translation of the knowledge between the necessary stakeholders is a necessity for a favorable outcome (Szulanski, 1996). However, knowledge management across diverging functions proves to be difficult for organizations as problems arise at the knowledge (Carlile, 2002). Design artifacts can take on a common reference point during CPs bringing different

thought worlds (Wenger, 2000) and turn into boundary objects (BOs). In this sense, BOs enable “representing, learning about, and transforming knowledge to resolve the consequences that exist at a given boundary” (Carlile, 2002, p. 422).

In the mediation and translation of social and conceptual worlds, Carlile (2002) identifies three types of knowledge boundaries. First, the syntactic border refers to the lack of a common syntax between different interest groups and the resulting language differences (Carlile, 2002). E.g., to express new ideas, managers may need to develop a new vocabulary that is difficult to communicate with developers. Second, the semantic boundary refers to differences in interpretation between different stakeholders (Carlile, 2002). E.g., managers and developers often have inconsistent interpretations of the desired solution qualities. Third, the pragmatic boundary refers to differences in stakeholder views based on different interests (Carlile, 2002). E.g., managers and technical experts may have different views on the implementation of a function because managers are interested in low development costs and developers in technical elegance.

BOs are defined by their ability to serve as bridges between overlapping social and conceptual worlds (Dougherty, 1992). Anchored in these worlds and thus meaningful, they create the conditions for cooperation, while their flexibility of interpretation means that they do not require “deep sharing” (Nicolini et al., 2012, p. 614). This is based on the understanding that the cross-border capabilities of an object relate to its characteristics. An object is abstract when it represents ideas in ambiguous, rudimentary, or generic terms, but concrete when it represents ideas in unambiguous or specific terms. An object is plastic if it can be adapted to situational requirements, and an object is robust if it cannot be adapted to situational requirements (Star, 2010).

As the pluralistic actors of CPs are required to communicate effectively with one another, to share their knowledge and expertise, to challenge each other’s assumptions and to work together in a collaborative manner, the need for objects with boundary spanning capabilities becomes apparent. According to Huber et al. (2020), the usage of BOs can have several desirable effects in CPs. Objects can facilitate the transfer and translation of knowledge (Carlile, 2004), the balancing of interests (Levina & Vaast, 2005), the coordination of expertise (Barrett & Oborn, 2010) and the overcoming of cultural differences (Barrett & Oborn, 2010), the realization of a vision (Boland et al., 2007), the communication of ideas (Boland et al., 2007), and the joint solution of problems (Ewenstein & Whyte, 2009). However, object use practices are highly context sensitive. A BO “may be performed differently across multiple sites, times, practices and participants, with varying effects” (Doolin & McLeod, 2012, p. 571).

Designated BOs are those that are created with the intention of possessing boundary spanning capabilities but not necessarily are used as such. While BOs in-use are those artefacts that are granted boundary spanning capabilities through their meaningful usage (Levina & Vaast, 2005). The individual performance of an artefact across actors and different sites varies greatly (Doolin & McLeod, 2012). Moreover, their boundary spanning capabilities are also strongly time dependent, making them potentially more useful in one phase of a collaboration than another (Star, 2010). The usefulness of an artefact is derived from the combination of its material properties and by the human intention of using it (Doolin & McLeod, 2012). This requires research in novel contexts with unique and even extreme characteristics to better understand the when and how objects are used. CPs with its pronounced non-routine activities and multi-stakeholder set-up offer a unique opportunity to answer the call with new context-specific explanations.

### 3 Research Methodology

Building on the conceptual foundations pointed out before, this study aims to analyze when BOs are facilitated in overcoming the challenges that occur in a multi-stakeholder collaboration setup such as CPs and how they can provide guidance in overcoming these challenges. Striving to contribute towards a better understanding of the boundary-spanning capabilities of objects, we inductively gain rich empirical data (Corbin und Straus, 1990; Eisenhardt, 1989) from a holistic in-depth single-case study to investigate the phenomenon of interest in its real-world context (Yin, 2003). The case selection was based on theoretical sampling, as suggested for enhancing concepts and theory (Eisenhardt & Graebner, 2007).

The case was chosen based on the following criteria: (i) something new is brought into being, (ii) significant change is introduced into organizations, (iii) temporality is given due to a given time frame, (iv) different actors with diverging background are participating, (v) ambiguity, which must be dealt with, is present, and (vi) numerous artefacts are created between various stakeholders in order to cross their knowledge boundaries. Finally, the chosen case derives from a university course where teams face business challenges provided by corporate sponsors. After the course, the case formed into the independent CP “Swissify” over the course of approximately twelve months.

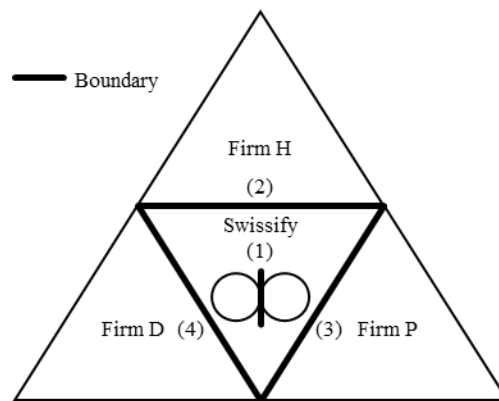
#### *Case description*

The context of our study is based on the single case of “Swissify” which originated at a business school in Switzerland. Initially, it had started out as part of an interdisciplinary lab course where students are presented with corporate partners and challenges corresponding to the corporations’ current needs. Our project collaborated with a Swiss insurance company (Firm H) which is one of the largest insurance companies in Switzerland. The challenge they proposed was: “How can we make life hassle-free for people that move to Switzerland?”. After several months of following the course guidelines, the solution “Swissify” was created, the first self-service relocation platform in Switzerland.

Due to a public presentation, one of Firm H’s partners (Firm P) had started exhibiting interest in the project too. Firm P is a Swiss market leader in relocation and mobility. The two companies and the Swissify project group agreed on a twelve-month collaboration. The resulting setup of Swissify is intricate, due its nature of constituting a non-legal entity, all the while nonetheless being an entirely self-contained and self-managed project granted with vast freedoms of autonomous authority. As part of the twelve-month joint journey starting in September 2018, the primary goal was to create a minimum viable product (MVP). This in turn required a developer to deploy the necessary solution.

Since neither Swissify nor any of the participating investors willingly had developers available, the collaboration was forced to look for an external development partner. Then they came across Firm D, a development company based in Switzerland. While the project was initiated as a graduate course in October 2017, the timeline that is considered for the purpose of this study ranges from October 2018, when the collaboration in question was formed, up until March 2020. Over the course of the project, not all four stakeholders were involved at all times, as Firm D only joined the collaboration at a later stage (April 2019 to March 2020) and Firm H left the collaboration after one year by withdrawing as an investor (July 2018 to October 2020). In April 2020, Swissify has been fully acquired by Firm P and now operates under new name.

As such, the case consisted of the following stakeholder groups (1) Swissify, (2) Firm H, (3) Firm P, and (4) Firm D. The Swiss team acted as the primary stakeholder group by being in the center of the relationship and in close contact with all the other stakeholder groups. The interaction among the actors occurred in four distinct modes with respective boundaries. Figure 2 illustrates the boundaries among the mentioned stakeholder groups involved in the CP. The party Swissify played a central role for the collaboration as it was the primary intermediary interface between all stakeholders.



**Figure 1** Boundaries among stakeholder groups involved in the creative project

### *Data Collecting and Data Analysis*

As this study aims to understand the presented challenges of CPs and the use of BOs within them in order to address these challenges, in-depth qualitative data had to be gathered from all four involved stakeholder groups to understand their individual perspectives. Thus, we obtained data from project-related documents (SoE1), card sorting experiments (SoE2), and semi-structured interviews (SoE3) as sources of evidence. In total, seven semi-structured interviews were conducted. All interviews were recorded and transcribed right after conduction during the months of November and December 2019. All the interviews were conducted in person except for one, which was conducted via video conferencing tool. Miro (digital whiteboard) was utilized for card sorting as a method for knowledge elicitation (Barrett & Edwards, 1995). Table 1 illustrates how the interviewees are related to the four stakeholder groups.

The interview consisted of two parts: The first one covered the collaboration as a whole and sought to find out what challenges were present, how they were handled, and which difficulties were still on the approach. The second part covered the concept of BOs which aimed to retrieve and rate the most useful artefacts created during the project and finding out whether these artefacts helped alleviate any of the challenges. In that regard participants were asked to play a card sorting exercise (SoE2), which consists of pre-labelled cards, each displaying artifacts derived from project-related documents (SoE1). All the interviews were recorded and transcribed verbatim as a preparation for subsequent coding (Corbin & Strauss, 2008). While the interviews were conducted in (Swiss) German and English, the coding was solely administered in English using the software tool

MAXQDA. The coding process followed the guidelines provided by Saldaña (2012) containing two cycles of coding. Resulting from the data analysis, patterns of common challenges, useful artefacts with boundary spanning capabilities, and potential remedies to the presented challenges were identified.

**Table 1** Sources of evidence according to stakeholder groups

<i>ID</i>	<i>Stakeholder</i>	<i>Associated position</i>	<i>Level of involvement</i>	<i>Duration</i>
(#S1)	Swissfy	Co-founder	High	86 min
(#H1)	Firm H	Head of innovation realisation	Mid to high	74 min
(#H2)	Firm H	Innovation manager	Mid	45 min
(#P1)	Firm P	Chief economic officer	Mid to high	67 min
(#P2)	Firm P	Chief operating officer	High	87 min
(#P3)	Firm P	Innovation accelerator	High	71 min
(#D1)	Firm D	Developer	High	64 min

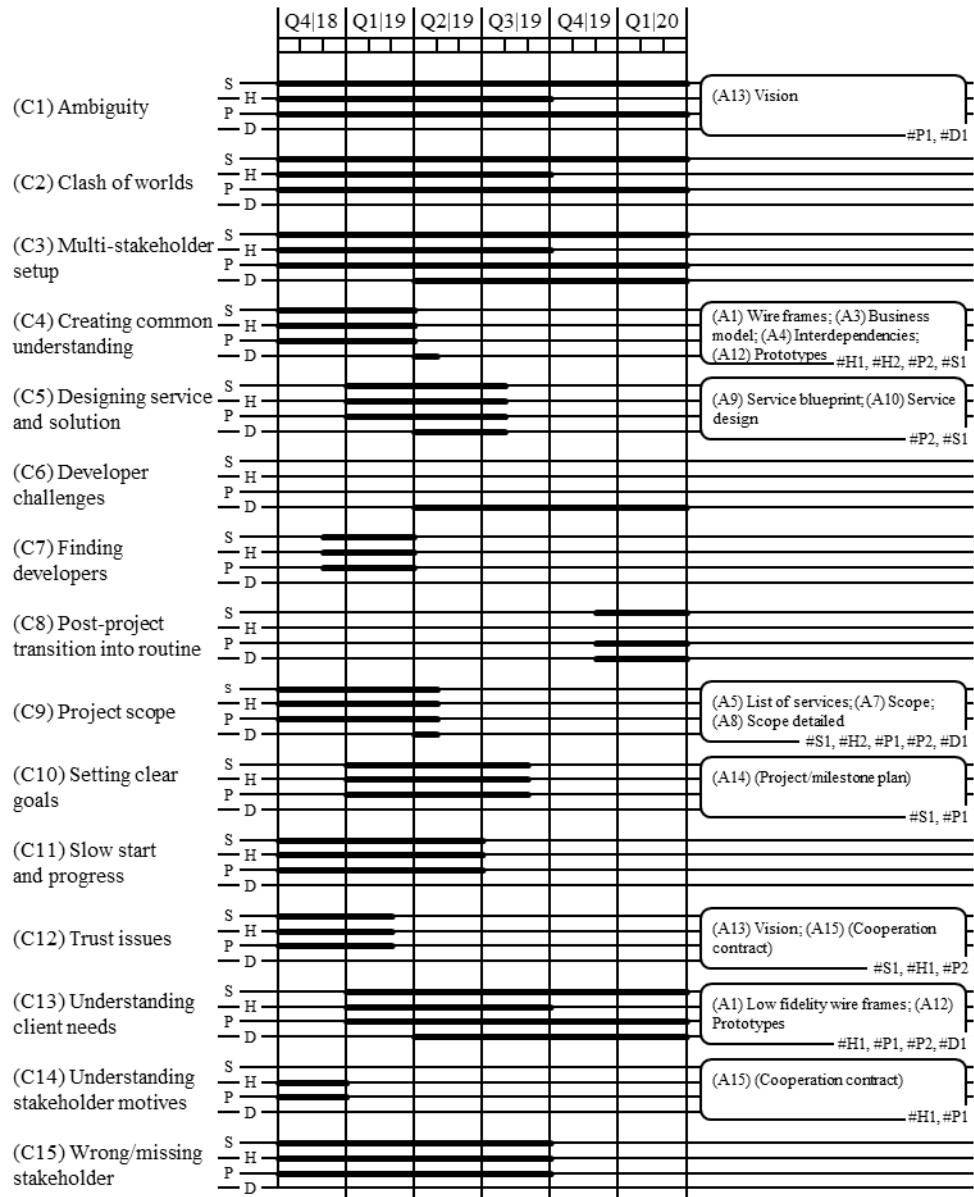
Source: Own representation

## 4 Results

As a result, we identified 20 different challenges, of which 15 carry general applicability (see Figure 2), namely: ambiguity, clash of worlds, complications with multiple stakeholders, creating a common understanding, designing service and solution, finding developers and their respective challenges, project scope, slow start and progress, understanding client needs, trust issues, post-project transition into routine, setting clear goals, understanding motives of each stakeholder and wrong/missing stakeholders. A detailed description and references to the source of evidence are given in the Appendix Table A.1. This selection was identified to be of general applicability as these challenges are likely to be faced by any multi-stakeholder collaboration, regardless of their respective duration and setup. The remaining five challenges were deemed to be too specific and idiosyncratic towards the Swissfy collaboration and thus not relevant for the broader masses, namely: lacking real user tests, matching knowledge and expertise, understanding complexity of Swiss immigration system as well as solutions and additional funding round.

It becomes apparent that some challenges are time dependent while others are not. The nature of these challenges pertains to a development cycle or collaboration stage and can be grouped according their timing. At the beginning, challenges of organizational nature occurred regarding finding common ground. In middle of the project, challenges were mainly tied to development, testing, and execution issues. At the end, challenges aroused primarily future planning. Challenges that persisted nearly for the entire project timeline, are due to the nature of CPs with multiple stakeholders (C1-3). Finally, the reason for the time dependency of certain challenges is because they were solved either using BOs or active communication or both. Figure 3 illustrates that not all challenges always affected all four stakeholders. Stakeholder D only joined the collaboration later in Q2 of 2019, and that Stakeholder H left the collaboration earlier at end of Q3 2019. While most challenges had an impact on all four stakeholders, it becomes apparent in that Stakeholder H was not particularly interested in the operational business questions as

much as it was in other topics. Finally, the figure indicates that those challenges which were of more political nature did not have any effect on Stakeholder D, as the discussions which included them primarily concerned the development directly.

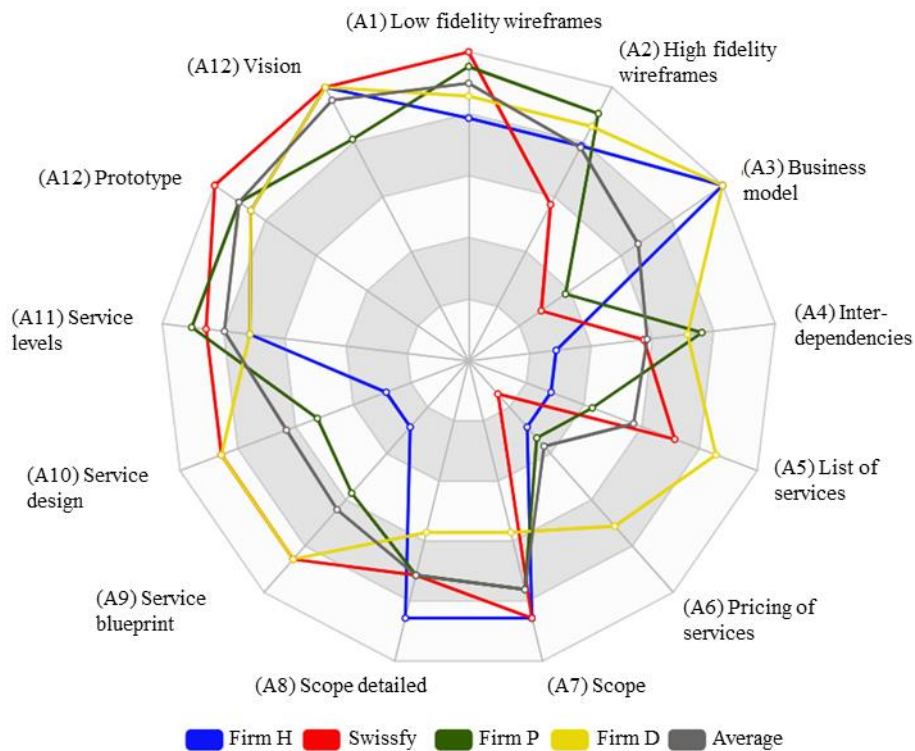


**Figure 2** Artefacts / boundary objects assigned to challenges according to the timeline of October 2019 (April 2020) to March 2020 (S: Swissify; H: Firm H; P: Firm P; D: Firm D)

Over the course of the project, various artefacts were created. Our document analysis revealed 13 artefacts, these include: Low- and high-fidelity wireframes, business model, depiction of interdependencies, list and prices of services, scope and detailed scope, ser-



vice blueprint, design, and levels as well as prototypes and vision statement. Two artifacts were added due to interview insights, namely: project/milestone plan and cooperation contract (depicted in brackets in Figure 3). Further descriptions are provided in Appendix Table A.2. More than half of the challenges could be matched with a suitable artefact, however, not all of them were fully resolved because of it. While they can contribute to minimizing the duration or impact of the challenges, they are not always able to eliminate it. Furthermore, those challenges without an assigned artefact are such that cannot be resolved through BOs and most of them come with the nature of CPs.



**Figure 4** Perceived value of boundary objects by stakeholder group (higher values towards the outer side)

In addition, the interviewees were asked to rate the utilized BO on a scale from least useful to most useful. Figure 4 shows the average aggregated rating per artefact per stakeholder group. There is a tendency towards finding the visual and tangible artefacts such as the wireframes and prototypes most useful among all stakeholders because “It’s visual! Most of us are visual” (#P3) as well as “I’m always one to try things out” (#H1). These artefacts were most concrete and allowed an easier access to all involved stakeholders. Further Stakeholder H ranks those artefacts pertaining to the operational business significantly lower than the more concrete and visual artefacts. H, as an investor, showed more interest in the “big-picture” objects such as potential revenue streams and prototypes rather than the daily-business processes. The visual artefacts enjoyed a higher overall rating than their operational counterparts during most of the collaboration, however a converse

switch of these priorities took place once the platform was published onto the live servers, as then the daily business took over and consequently the operational artefacts became considerably more important. Further analysis of the card sorting exercise during the interviews showed that the results of the most useful artefacts are in line with those that were deemed most boundary spanning capabilities. The highest rated artefacts in terms of their perceived value were also the same artefacts that exhibited the greatest boundary spanning capabilities for the entire collaboration.

## 6 Discussion

Our study attempts to explore the challenges of CPs and how BOs can help overcome these challenges. Thus, the discussion is guided by the three motifs nature of challenges, characteristics of BOs, and temporality. First, the origins of the identified challenges stem from the inevitable difficulties of coordinating the various heterogeneous and pluralistic stakeholders, along with their divergent skills and tasks (Gillier et al., 2015). Further, they trace back to inherent complexity and uncertainty that CPs carry along (Paletz, 2012). All challenges differ in their temporality, as some are tied to a specific stage of development or collaboration, while others, due to the nature of creative projects, last for a longer period. The factors that contribute to these challenges are based on the ambiguity that exists at the beginning of such collaborations, as they are usually being conducted for the first time and roles and responsibilities are not yet defined (Skilton & Dooley, 2010). Finally, not all challenges affect all actors involved and are strongly linked to their intentions, the situational context, and the time. It depends largely on the individual willingness of the actors involved to learn from and challenge each other and to share their existing knowledge (Simon, 2006).

Second, interactive, visual, and concrete artefacts are considered more useful than those which are more descriptive and pertaining to the operational aspects. A converse shift of these priorities becomes true once the platform was published. During this phase the operational artefacts better support the daily business than their visual counterparts. As such, this finding confirms the high contextual sensitivity (Doolin & McLeod, 2012). Further, artefacts that exhibited the highest perceived value, were the very same artefacts that exhibited the highest boundary spanning capabilities. Finally, that some artefacts, despite their low usage rank high in value, indicates that an artefact neither needs to be used continuously during the project for it to become useful for the collaboration, nor does it influence its qualities of possessing boundary spanning capabilities. While the BO certainly needs to be “in-use”, the degree of actual usage can evidently be minimal while still maintaining its high value. Finally, in terms of their characteristic, these low-usage artefacts also tend to be robust rather than plastic, due to the conscious choice of the stakeholders to ensure a certain level of stability in the collaboration.

Third, more than half of all identified challenges were matched with a BO. However, not all these challenges were fully resolved because of it. Long-term challenges tend to be those along the pragmatic knowledge boundary (C2, C13, C15). As such, these results confirm the notion of the pragmatic boundary depicting the most complex of three boundaries in terms of knowledge sharing, due to the necessity of having to align the interest of all stakeholders (Carlile, 2004). Our research contributes to the finding through the addition of the temporality, suggesting that the three knowledge boundaries do not only depict an increasing complexity but also an increasing duration of underlying chal-

lenges. Complications of the multi-stakeholder setup cannot be assigned to any border because the challenge consists primarily of coordinative and organizational efforts which emerge naturally in creative projects. They are not due to any present boundaries. Robust artifacts are those that seem to have a lower usage than the plastic ones. However, their low usage does not equate with a low perceived value since some of the robust artefacts are considered very valuable for the cooperation, namely the vision statement.

## Implications and Conclusion

In summary, the contributions of our study are quadripartite and contribute both to research and practice. (1) Challenges can be separated to ones that pertains to a certain development cycle or collaboration stage and ones that persisted nearly for the entirety of the project timeline. The latter are due to the nature of creative projects with multiple stakeholders. The reason for the time dependency of certain challenges is because they were solved either using BOs, active communication, or both. (2) Visual and tangible artefacts such as the wireframes and prototypes are considered most useful among all stakeholders. Priorities shifted once the service went live, as then the daily business took over and consequently the operational artefacts became considerably more important. (3) More than half of the challenges could be matched with a suitable artefact. Challenges without an assigned artefact are such that cannot be resolved through BOs and most of them come with the nature of creative projects. (4) BOs do not necessarily have to be “in-use” to be useful. For example, a vision can serve as a fixed star for collaboration.

Nevertheless, our results must be viewed in the light of its limitations. First, the selected single case that may not be fully representative and generalizable. However, the conditions were like those within many set-ups. Projects are initiated to create something new and introduce change outside the routine. Second, the number of seven interviews across four stakeholder groups seems to be insufficient to generalize findings. Third, the introduced change into the organizations was not considered in detail. Thus, future research is needed in a multi-case design with a larger sample size that focuses on the nature of changes introduced.

## References

- Bakker, R. M., Boroş, S., Kenis, P., & Oerlemans, L. A. G. (2013). It's Only Temporary: Time Frame and the Dynamics of Creative Project Teams: It's Only Temporary: Time Frame and Creative Project Teams. *British Journal of Management*, 24(3), 383–397.
- Barrett, A. R., & Edwards, J. S. (1995). Knowledge elicitation and knowledge representation in a large domain with multiple experts. *Expert Systems with Applications*, 8(1), 169–176.
- Bechky, B. A. (2006). Gaffers, Gofers, and Grips: Role-Based Coordination in Temporary Organizations. *Organization Science*, 17(1), 3–21.
- Carlile, P. R. (2002). A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New Product Development. *Organization Science*, 13(4), 442–455.

- Carlile, P. R. (2004). Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries. *Organization Science*, 15(5), 555–568.
- Cohen, M. D., March, J. G., & Olsen, J. P. (1972). A Garbage Can Model of Organizational Choice. *Administrative Science Quarterly*, 17(1), 1.
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21.
- Corbin, J., & Strauss, A. (2008). *Basics of Qualitative Research (3rd ed.): Techniques and Procedures for Developing Grounded Theory*. SAGE Publications, Inc.
- Doolin, B., & McLeod, L. (2012). Sociomateriality and boundary objects in information systems development. *European Journal of Information Systems*, 21(5), 570–586.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532.
- Eisenhardt, K. M., & Graebner, M. E. (2007). Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*, 50(1), 25–32.
- Fetterhoff, T. J., & Voelkel, D. (2006). Managing Open Innovation in Biotechnology. *Research-Technology Management*, 49(3), 14–18.
- Gerling, C., Bosch-Herterich, A., Paula, D. de, Haskamp, T., & Uebernickel, F. (2020). Exploring Boundary Objects and their Affordances in the context of Design Thinking Projects from a Multi-Stakeholder Perspective. *Innovation and Product Development Management Conference*.
- Gillier, T., Hooge, S., & Piat, G. (2015). Framing value management for creative projects: An expansive perspective. *International Journal of Project Management*, 33(4), 947–960.
- Goodman, R. A., & Goodman, L. P. (1976). Some Management Issues in Temporary Systems: A Study of Professional Development and Manpower-The Theater Case. *Administrative Science Quarterly*, 21(3), 494.
- Huber, T. L., Winkler, M. A. E., Dibbern, J., & Brown, C. V. (2020). The use of prototypes to bridge knowledge boundaries in agile software development. *Information Systems Journal*, 30(2), 270–294.
- Kimble, C., Grenier, C., & Goglio-Primard, K. (2010). Innovation and knowledge sharing across professional boundaries: Political interplay between boundary objects and brokers. *International Journal of Information Management*, 30(5), 437–444.
- Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, 5(1), 14–37.
- Obstfeld, D. (2012). Creative Projects: A Less Routine Approach Toward Getting New Things Done. *Organization Science*, 23(6), 1571–1592.
- Paletz, S. B. F. (2012). Project Management of Innovative Teams. In *Handbook of Organizational Creativity* (pp. 421–455). Elsevier.

- Paris, T., & Ben Mahmoud-Jouini, S. (2019). The process of creation in creative industries. *Creativity and Innovation Management*, 28(3), 403–419.
- Paulraj, A., Lado, A. A., & Chen, I. J. (2008). Inter-organizational communication as a relational competency: Antecedents and performance outcomes in collaborative buyer-supplier relationships. *Journal of Operations Management*, 26(1), 45–64.
- Puranam, P., Alexy, O., & Reitzig, M. (2014). What’s “new” about new forms of organizing? *Academy of Management Review*, 39(2), 162–180.
- Saldana, J. (2012). *The Coding Manual for Qualitative Researchers*. SAGE Publications.
- Simon, L. (2006). Managing creative projects: An empirical synthesis of activities. *International Journal of Project Management*, 24(2), 116–126.
- Skilton, P. F., & Dooley, K. J. (2010). The Effects of Repeat Collaboration on Creative Abrasion. *Academy of Management Review*, 35(1), 118–134.
- Slowinski, G., Hummel, E., Gupta, A., & Gilmont, E. R. (2009). Effective Practices for Sourcing Innovation. *Research-Technology Management*, 52(1), 27–34.
- Star, S. L. (2010). This is Not a Boundary Object: Reflections on the Origin of a Concept. *Science, Technology, & Human Values*, 35(5), 601–617.
- Star, S. L., & Griesemer, J. R. (1989). Institutional Ecology, ‘Translations’ and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907-39. *Social Studies of Science*, 19(3), 387–420.
- Sydow, J., Lindkvist, L., & DeFillippi, R. (2004). *Project-based organizations, embeddedness and repositories of knowledge*. SAGE publications Sage CA: Thousand Oaks, CA.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm: Exploring Internal Stickiness. *Strategic Management Journal*, 17(S2), 27–43.
- Turner, J. R., & Müller, R. (2003). On the nature of the project as a temporary organization. *International Journal of Project Management*, 21(1), 1–8.
- Vanhaverbeke, W. (2006). The interorganizational context of open innovation. *Open Innovation: Researching a New Paradigm*, 205–219.
- Walfisz, M., Zackariasson, P., & Wilson, T. L. (2006). Real-time strategy: Evolutionary game development. *Business Horizons*, 49(6), 487–498.
- Wenger, E. (2000). Communities of Practice and Social Learning Systems. *Organization*, 7(2), 225–246.
- Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed). Sage Publications.

## Appendix

**Table A.1** Descriptions and references of identified challenges {considered not generalizable}

<i>ID</i>	<i>Challenge</i>	<i>Describe</i>	<i>Reference</i>
(C1)	Ambiguity	Each stakeholder group had diverging goals and potential directions in mind	#H1, #H2, #P1, #P2, #P3, #S1
(C2)	Clash of worlds	A collaboration of four unique stakeholders brings about diverging cultures, practices, and mindsets	#H1, #H2, #P1, #P3
(C3)	Multi-stakeholder setup	Encompassing two or more involved parties produced challenges of alignment	#H1, #P1, #P2, #P3, #S1
(C4)	Creating a common understanding	Technical aspects, customer needs, expertise and expectation were sources of uncertainty	#D1, #P1, #H1, #H2, #S1
(C5)	Designing service and solution	Designing the offered services in an intuitive and feasible manner required several iterations	#D1, #P1, #P2, #H1, #S1
(C6)	Developer challenges	Agency, developing the solution, was confronted with contradicting requirements of stakeholders	#D1
(C7)	Finding developers	The lack of internal developers forced to look for developers outside the participating organizations	#H1, #P1
(C8)	Post-project transition into routine	After completion of the project, the findings had to be transferred into the routines of the buyer	#D1, #H1, #H2, #P1, #P2, #S1
(C9)	Project scope	Finding a balance between simplicity and comprehensive solution proved to be difficult	#D1, #P1, #P2, #P3, #H1, #S1
(C10)	Setting clear goals	Not all stakeholders made their tacit expectations explicit leading to disappointments later	#P1, #P3, #S1
(C11)	Slow start and progress	Coordination among all stakeholders caused delays, which in turn led to confusion and delays	#H1, #P1, #P2, #P3, #S1
(C12)	Trust issues	Due to mistrust, Firm P was unwilling to present solutions to their existing clients	#H1, #P2, #P3, #S1
(C13)	Understanding client needs	Capturing feedback from real users and understanding it proved to be troublesome at times.	#H1, #P3, #S1
(C14)	Understand motives of stakeholders	Addressing IP rights and settling the individual responsibilities and obligations was challenging	#H1, #P1, #P2
(C15)	Wrong/missing stakeholder	Firm H failed to incorporate members and expertise of the traditional insurance team	#H2, #P1, #P2, #P3, #S1
(C16)	{Lacking real user tests}	Accessing suitable end-users was challenging because there were not directly available	#H1, #P3
(C17)	{Match knowledge and expertise}	Acquired knowledge and expertise needed to be articulated and matched to ensure a common path	#P1, #P2, #S1
(C18)	{Additional funding round}	Swissify attempted to raise funds for a six-month extension from Firm H	#H2, #P1, #P2, #S1
(C19)	{Understanding complexities}	Understanding dependencies between the various steps when moving to Switzerland proved difficult	#P2, #H2, #S1, #D1
(C20)	{Understanding solution}	All stakeholders necessarily needed to fully comprehend the proposed solution and all its features	#H1, #P1, #P2, #D1

Source: Own representation

**Table A.2** Descriptions of identified artefacts

<i>ID</i>	<i>Artefact</i>	<i>Description</i>
(A1)	Low fidelity wireframes	First wireframes based on the prototypes and all previous discussions - first real glimpse into the solution
(A2)	High fidelity wireframes	Last iteration of the wireframes that were then coloured, branded, and put in the appropriate design
(A3)	Business model	Decision tree showing where the revenue is intended to be generated and why this specific path was chosen
(A4)	Interdependencies	Depicts the complex interdependencies of the convoluted mandatory tasks when moving to Switzerland
(A5)	List of services	Complete sheet of all services depicting their names, the service providers, the teaser text, and the description
(A6)	Pricing of services	Complete sheet of all services, their time delivery, corresponding individual price calculations and rates
(A7)	Scope	Rough overview of what is to be included in the MVP, who it addresses, and where the focus lies in the first phase
(A8)	Scope detailed	A more detailed version of scope, showcasing first details about its architecture, functionalities, and requirements
(A9)	Service blueprint	Shows the entirety of the front and backend processes of when a user purchases a service on the platform
(A10)	Service design	Earlier sketch of the service blueprint which focuses on the frontend customer journey
(A11)	Service levels	Model showing the various software architectural levels which the customers can navigate through logically
(A12)	Prototypes	Initial prototypes that kicked off the collaboration and which was foundation for all the following discussions
(A13)	Vison	A Venn diagram depicting the vision, mission and goals of the collaboration and solution

Source: Own representation