From organizing for innovation to innovating for organization: how co-design fosters change in organizations.

Louis-Etienne Dubois
HEC Montréal (MosaiC) – MINES ParisTech (CGS)
louis-etienne.dubois@hec.ca

Pascal Le Masson
MINES ParisTech (CGS)

Benoit Weil
MINES ParisTech (CGS)

Patrick Cohendet
HEC Montréal (MosaiC)

Abstract :

Amongst the plethora of methods that have been developed over the years to involve users, suppliers, buyers or other stakeholders in the design of new objects, co-design has been advertised as a way to generate innovation in a more efficient and more inclusive manner. Yet, empirical evidence that demonstrates its innovativeness is still hard to come by. Moreover, the fact that co-design workshops are gatherings of participants with little design credentials and often no prior relationships raises serious doubts on its potential to generate novelty. In this paper[1], we study the contextual elements of 21 workshops in order to better understand what co-design really yields in terms of design outputs and relational outcomes. Our data suggest that co-design emerges in crisis situations and that it is best used as a two-time intervention. We also suggest using collaborative design activities as a way to bring about change through innovation.

Key words: co-design, design, innovation, collaboration, change management

---

[1] A similar version of this working-paper will also be presented by one of the co-authors at the IPDM conference, June 2014. A slightly larger empirical base will be used for this second version, as the study is still ongoing.

From organizing for innovation to innovating for organization: how co-design fosters change in organizations.

Introduction

Open, cross-boundary, participative, collaborative, distributed: whatever the word used, innovation has become a practice known to involve a wide array of actors (Chesbrough, 2003; Remneland-Wikhamn & Wikhamn, 2011). Amongst the plethora of methods that have been developed over the years, collaborative design activities, also known as co-design, are increasingly used to design new products, services and even public policies with users, citizens and other stakeholders (Sanders & Stappers 2008; Berger et al. 2005).

While its tools and methods, as well as its benefits for design purposes, have been discussed at length, the settings in which such activities arise and more importantly its effects on the groups, organizations and design collectives remain to this date misunderstood (Kleinsmann et al 2007; Schwarz & Krabbendam, 2013). Yet, initial contexts, which can be defined by and explored through the relationship between stakeholders, should be of major interest for they play a significant role in the unfolding of collaborative design or joint innovation processes (Clauß, 2012). Furthermore, the fact that co-design workshops often involves participants who lack design credentials and do not share some sort of common purpose raises serious questions on the potential for innovation and motivations to take part in such time-consuming activities.

The purpose of this paper is to shed light on the context of co-design activities and its outputs, arguing that it may be used as a change management intervention while being advertised as a design and innovation best practice. Through a multiple-case study, we investigate the contextual elements of 21 workshops in which stakeholders gather, often for the very first time, to design new products, services or processes together. Following an overview of the literature on innovation, design and collaboration, we lay out based on our results a typology of contextual crisis in which co-design is used. Finally, we suggest that co-design should not be seen as design best practice, but rather as a two-phase intervention in which relationships or ties must first be reinforced through design activities before innovation issues can be tackled.

Literature Review

Over the past decades, innovation has received increased attention from practitioners and academics altogether, resulting in new forms for organizing such activities and a large body of literature on its every dimension (Remneland-Wikhamn & Wikhamn, 2011). Garel & Mock (2011:133) argue that "innovation requires a collective action and an organized environment". In other words, we need on one side people, preferably with relevant knowledge and skills (expertise), and on the other side, a collaborative setting in which diverse yet compatible collectives can come together to design new products, services or processes. This classic innovation scheme holds true for not only standard R&D teams, but also for new and more open forms of innovation in which users interact with industry experts in well-defined platforms (Piller, 2004; von Hippel, 2005). Accordingly, the literature review is structured as follows: first on the rationale behind the need for organized environment in which stakeholders can design and innovate, and then on the collective action that drives the collaboration between them.

From open innovation (Chesbrough, 2003) to participative design (Schuler & Namioka, 1993), the call for broader involvement in organizations' design, NPD and innovation activities has been heard widely and acted upon by many (von Hippel, 2005; Hatchuel et al. 2011). Seen as a response to mounting competitive pressures, cross-boundaries practices are a way for organizations broadly taken to remain innovative, adaptive and flexible (Teece, 2007). The case for openness, as put forth in the literature, is built on the promise of reduced uncertainty, more efficient processes, better products and positive market reaction to the introduction of the innovation (Diener & Piller, 2010; Thomke 2003). Rather than focusing on cost reductions alone, open and collaborative are to be implemented for the value-added and creativity they bring to the table (Remneland-Wikhamn & Knights, 2012). As a result, organizations are increasingly engaging with their stakeholders to tap into their knowledge base, leverage value co-creation potential and integrate them in various stages of new product or service development activities (Lusch, Vargo & O'Brien, 2007; Da Mota Pedrosa, 2012). However, openness to outside ideas does not come naturally. The existence of the well-documented "not-invented-here" syndrome (Katz & Allen, 1982) has academics constantly remind us that open innovation can only emerge in settings where the culture welcomes and nurtures ideas from outsiders (Hurley & Hult, 1998).

The field of design has long embraced this participatory trend. Designers have been looking for more than forty years now for ways to empower users and make them more visible in the design process (Stewart & Hyysaalo, 2008). As a result, multiple approaches now coexist and have yielded a rich literature often focused on visualisation tools, design techniques and the benefits of more-inclusive objects that are obtained through sustained collaboration with users. Whether empathic (e.g. Koskinen et al. 2003), user-centered (e.g. Norman & Draper, 1986), participatory (Schuler & Namioka, 1993) or contextual (e.g. Wixon et al. 1990), streams of "user-active" design presupposes engaging with willing participants in order to improve the construction process and output. Still too often, the interactions between those who know and those who do remain shallow, and are limited to having users discuss the design of services or products (Luke, 2012). Worse, the multiplication of participatory design approaches, often calling a rose by another name, has resulted in practical and theoretical perplexity. According to Sanders et al. (2010: 195) "many practices for how to involve people in designing have been used and developed during the years» and as a untended consequence, "there is some confusion as to which tools and techniques to use, when, and for what purpose".

Amongst these «better design methods», co-design seeks the active participation and integration of users' viewpoints throughout the entire design process. This expression has been in the design landscape for more than thirty years, initially to describe the simultaneous construction of hardware and software components of complex embedded systems (Burkhardt & Ittelson, 1978). Only lately has it been used to denote close integration of suppliers in the design of material goods (i.e cars, Spina et al. 2002) and customers in the design of consumer goods (Pillar, 2004). More than a glorified focus group, outsiders gather to create the object, not just discuss about it. According to Pillar et al. (2011: 9), the intended purpose of these activities "is to utilize the information and capabilities of customers and users for the innovation process". As such, co-design is often portrayed as a way to facilitate mass customization through platforms, enabling better design in settings where users are already willing to take part in the process. Yet, a more accurate and acknowledged definition of co-design refers to it as a collective approach "applied across the whole span of a design process, (where) designers and people not trained in design are working together in the design development process" (Sanders & Stappers, 2008:6).

However, active participation of stakeholders and users in innovation or design processes does not always lead to positive outcomes. For one, Christensen (1997) has studied situations (dilemmas) in which intensively catering to existing users leads to diminishing returns and loss of vision. Da Mota Pedrosa (2012) also demonstrate that too much user integration in innovation process becomes detrimental to an organization, and that the bulk of the interactions should occur early in the ideation process rather than in the later development and production stages. Within innovation and design teams, many other authors have advocated for diversity and opposition of personalities in order in order to successfully generate novelty (e.g. Kirton, 1984), only to find out that they stand falling into over-specialization pitfalls where (Bilton, 2007). Finally, Holzer (2012) raises the all-important mutual understanding hurdles that heterogeneous innovation groups face, which sometimes translates into a lack of shared meaning and conflict.

Collective action and collaboration in innovation are also well documented in the literature. Choosing partners, whether it is your suppliers, buyers or other firms, is often portrayed as a strategic, yet highly contextual decision, where issues of trustworthiness, confidentiality and relevance are paramount (Clauß, 2012). Prior relationships, mutual understanding and common identity are also said to play a role in the successful development of social cohesion and innovation (Coleman, 1988; Dyer & Nobeoka, 2000). In other words, engaging in exploratory activities across boundaries requires that the actors know and trust each other, are willing to play nice and share a minimum of behavioural norms (Clauß, 2012). Along the same lines, Fleming et al. (2007:444) state that "closed social structures engender greater trust among individuals », which in turn generate more collaboration, creativity and ultimately more innovation. Simply put, the absence of social proximity or relationships precludes the expression of creativity and the emergence of novelty.

This translates into settings or contexts in which open dialogue, inclusiveness and collaboration amongst individual leads to new objects (Remneland-Wikhamn & Knights, 2012). Without a common purpose, groups are bound to failure or conflict, for "goal incongruence hinders (the construction of) a joint solution (Xie, Song & Stringfellow, 2003). While relevant to our study, this literature remains elusive on more open forms of collaborative design, where relationships are multiple, often not obvious (i.e. not one firm and its few suppliers, but rather a "many-to-many" format) and not held together by contractual ties (Hinde, 1997). Moreover, repeated

interactions and equal commitment, two important drivers of collaboration in design (Clauß, 2012), are unlikely in ad-hoc formats such co-design in which interests are seldom shared (i.e. users are hardly committed at improving the firm's bottom line). Figure 1 below combines these streams in the literature, in which collectives and expertise are considered as innovation inputs.

Figure 1. What co-design should look like based on innovation and collaboration theory
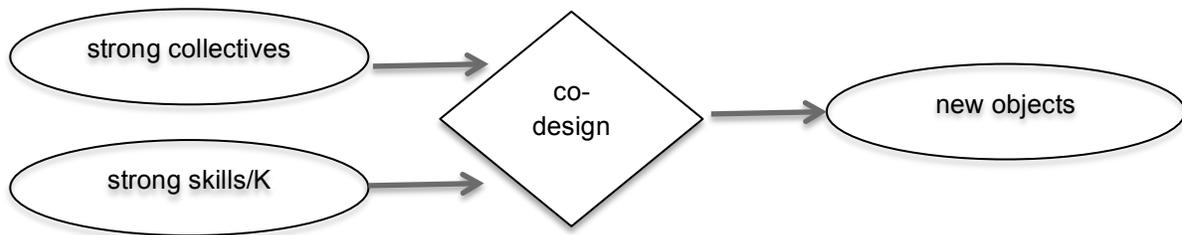
Yet first-hand observation of co-design activities leads one to denote that it 1) often involves people who lack design credentials and 2) gathers people with little to none prior history of working together or even sometimes a desire to collaborate. Our extended immersion in a setting that holds co-design workshops on a regular basis, as well as observations of several workshops in Europe has yielded few successful design outputs to account for. What's more, participants are seldom lead-users with relevant deep knowledge (von Hippel, 1986), nor driven by shared values or purpose as in an organization or an innovation community (Raymond, 1999; Adler & Heckscher, 1996). As opposed to Saxenian & Sabel (2008: 390) who argue that «it is possible to foster collaboration (…) only when social connections have become so dense and reliable that it is almost superfluous to do so», collaborative design workshops often take place in relational deserts. Very few experts and poor relationships: what can we really expect?

To a point, this situation is consistent with what authors such as Granovetter (1973, 1985) on the strength on weak ties and Burt (1992) on network embeddeness have studied. They demonstrate that too much social and cognitive proximity can be detrimental to innovation. When too much social cohesion exists, knowledge variety and access to sources elsewhere in the network are hindered, thus limiting one's ability to generate novelty. This phenomenon, described as the "paradox-of-embededdness" (Uzzi, 1997), shows that knowledge homogeneity can be an

obstacle to collaboration, especially when it is geared towards innovation. Noteboom (2000) further explains this paradox by talking about "cognitive distance", where following an inverted-u curve, too little or too much proximity results in sub-optimal innovation outcomes. Being further away, cognition and social wise, is also said to help avoid creativity hurdles such as "group-think" (Janis, 1972) and fear of the outside world (Coleman, 1957). While the jury is still out of whether weak or strong ties are best for innovation, authors have suggested that network configuration and density should be adapted to the nature of the task (i.e weak for exploration vs. strong for exploitation, Noteboom, 2000) or external conditions (Rowley et al., 2000). In other words, this literature argues that despite facing challenges in getting heterogeneous groups to collaborate, those who do can expect a proper innovation pay-off. Then again, going back to workshops witnessed over the past two years, we are still confronted with the same problem: even with weak ties, it still does not yield novelty. If no one configuration results in innovation, could it be that we are looking at it the wrong way? More importantly, could it be that co-design is geared to generate more than just new objects?

And so we ask: what drives, as in one of our cases, elders, students, caregivers and representatives from an insurance company to design together? Or toddlers, teachers, architects and school board officials to get together to re-invent the classroom? In other words, why does co-design always seem to emerge in settings where basic conditions for collaboration and innovation are lacking (Huxham, 1996). Are such weak ties really generative? This, we argue, calls for a broader investigation of co-design; one that does not separate new object design (outputs) from effects on the design collective (outcomes). Hence, this paper addresses the following questions: what defines co-design contexts and what do workshops really yield?

Research Method and Empirical Base

Following a multiple case study methodology (Eisenhardt, 1989; Yin 1994), of both retrospective and current cases, we investigate different contexts (i.e. organizational, pedagogical, industrial, etc.) in which co-design is used and the relationship between participants. Through semi-structured or sometimes informal interviews, as well observation of both planning and execution phases of workshops, we investigate the background setting, prior

relationships between participants and actual outputs of 21 different co-design workshops in 4 countries (France, Finland, Netherlands, Belgium). In total, we interviewed 20 participants (lasting anywhere from 15 to 60 minutes at a time) and witnessed 10 live workshops (lasting 5 to 8 hours each time). Since co-design is still an emerging phenomenon theory-wise, the methodology was designed in a way that was coherent with our research object (Edmonson & McManus, 2007; von Krogh et al. 2012). As such, our desire to contribute to the development of a co-design theory invited a broad study of different contexts and workshops. Adopting a "grounded theorist" posture (Glaser & Strauss, 1967), we opted for a qualitative study of multiple dimensions of a same phenomenon (Shah & Corley, 2006). Moreover, we used different collection tools to better apprehend it in all of its complexity (Eisenhardt & Grabner, 2007).

Cases for this study were selected based on an opportunity sampling, meaning we studied both past workshops and attended live experiments as they became available to us. For retrospective cases, we made sure that were less than a year old and that access to both participants and documentation was readily available to prevent any time bias. Only case was older (C1), yet was thoroughly documented in a book shortly after, thus preventing distortion. Our questions touched on relationships dimensions amongst participants; their thoughts on the workshop and on they personally and collectively took away from their experience. To ensure the coherence of our data, we only studied co-design workshops that had a similar format, in terms of length (1 day), protocol (divergent-convergent sequence), tools and number of participants (15-25 at a time). Furthermore, as we still lack co-design theory to guide us in the identification of cases, we simply made sure that they 1) involved a wide array of participants and stakeholders (the "co") and 2) focused on the creation of a new object (the "design", as opposed to testing of existing concepts). Interviews were conducted during and after the workshops, recorded when possible and transcribed by the lead author. Key excerpts were later shared to the respondents during two group interviews, to ensure the validity of the interview content. Data collected for this article was made anonymous, in order to prevent any sensitive innovation material, design issues or interpersonal conflicts from leaking out in the open.

Once transcribed, we then looked into our interview material, as well as secondary sources, for any information that could help us assess prior relationship (or lack thereof) between

participants. Quotes pertaining to working or personal relationships, apprehensions towards collaboration and potential conflicts were highlighted, and in turn codified into first-level categories. We also asked (for retrospective cases) or observed the tangible design outputs of each workshop in order to see if the initial design goals were met. The lead author first conducted this task, followed by a discussion of the results with the co-authors, all reaching agreement on the coded data, the different categories and the subsequent interpretation of the results. Table 1 below sums up the contextual elements of the 21 cases studied in this article.

Table 1. Summary of the contextual elements for 21 co-design workshops studied.

CASE	PURPOSE	PARTICIPANTS	PRIOR RELATIONSHIPS	DESIGN OUTPUTS
L1	Designing an application to improve sales and customer in-store experience	Sale clerks, IT and marketing employees customers, students	Little to none. Employees have internally designed together, but never with other stakeholders.	Early concepts from IT staff are not well received. No consensual concept emerges.
A1	Using RFID technology to locate items in the store in real-time.	Store employees and management, IT experts, customers, students.	Little to none. Employees have internally designed together, but never with other stakeholders.	Functionalities emerge, but no working concept or prototype designed.
A2	Designing the in-store offices of the future for sales associates and managers.	Store employees and management, ergonomist students.	Little to none. Employees have internally designed together, but never with other stakeholders. Some returning participants (A1)	Client intends to recommend testing some of new office concepts.
A3	Using no-contact technology to locate to improve in-store customer experience	Store employees and management, IT experts, customers, students.	Little to none. Employees have internally designed together, but never with other stakeholders. Some returning participants (A2)	Successful design of a smartphone application working prototype. In store real testing is planned.
O1	Designing new sensors to better measure athletes' performance	Store employees and management, IT experts, customers, students.	Little to none. Employees have internally designed together, but never with other stakeholders.	Functionalities emerge, but no working concept or prototype designed.
O2	Using kinect-like technology to create new in-store interactions with customers.	Store employees and management, IT experts, customers, students.	Little to none. Employees have internally designed together, but never with other stakeholders. No returning participants (O1)	Functionalities emerge, but no working concept or prototype designed.
O3	Facilitating shoe selection and shoe fitting with new technologies	Store employees and management, IT experts, customers, students.	Little to none. Employees have internally designed together, but never with other stakeholders. No returning participants (O2)	Functionalities emerge, but no working concept or prototype designed.
GT1	Designing "agro-sourced" furniture using recycled fabrics.	R&D employees, researchers, engineers, students.	Little to none. Employees have internally designed together, but never with outsiders and students.	No working concept or prototype designed, but participants agree on common design criteria.
GT2	Designing "agro-sourced" furniture using recycled fabrics.	R&D employees, researchers, engineers, students	Most participants returning from GT1 workshop	New concepts emerge and new combinations of existing resources.

CS1	Designing a research program across several scientific fields	Scientists and researchers from different fields (chemistry physics, engineering, etc.)	Little to none. Know each other, but have been working separately on their projects to that point.	New research paths and collaborations are identified, but no program is defined.
GS1	Designing ways to guide customers in the store.	Store managers, suppliers, IT experts, brand managers, customers, students.	Little to none. Employees have internally designed together, but never with other stakeholders.	Conflict breaks out, participants unable to generate consensual concepts.
MUT1	Finding new ways to help elders deal with health issues and facilitate care	Elders, representatives from insurance co., students, caregivers	None. First time stakeholders meet to collaborate or design.	Three concepts are designed, but remain to be translated into new products or services
W1	Designing creativity hubs across a region	Artists, officials, designers, small entrepreneurs, academics	Moderate. See each other often, but have never collaborated / designed.	6 concepts of new creativity hubs emerge, integrating the different local 'savoir-faire'.
N1	Reinventing a new city from the bottom up	Local activists, city officials, small entrepreneurs, designers, artists	Little to none. May have worked on projects together in the past, but not as widely inclusive.	Concepts are voted down to 3 projects-to-be for the city, touching on transportation, environment and housing.
P1	Finding new roles for mailmen in response to declining mail volume	Mailmen, HR staff, management, city officials, citizens	Little to none. Some working priors, but have never designed together.	No concepts, but participants agree that mailmen are essential social actors who could deliver other things.
E1	Redesigning a company's governance and managers' roles following a merger.	HR managers, students, researchers, workplace psychologist	None. First time the company outsources internal design issues.	Participants cannot agree on a common concept and new job definitions for managers.
H1	Designing a common strategy for the 9 key projects of an organization.	Project leaders, academics, support staff, HR staff, managers, PR staff.	Little to none. Know each other, but have been working separately on their projects to that point.	Participants exchange and identify common grounds for a potential joint strategy, yet no clear plan emerges.
D1	Designing a new kind of doctoral school with students and local businesses.	Entrepreneurs, business owners, doctoral student, university management, academics.	None. Doctoral students are spread across the schools and do not interact with businesses	Created a structure, a name and branding elements. Gathered again to work out the activities and planning.
R1	Designing an energy efficient research hub	Researchers, professors, students, support staff (janitors, administrative assistant)	Little to none. Co-habit the same buildings; yet have never engaged in collaborative work.	5 concepts emerge, ranging from spider-web walls to tide-powered entrances. Lots of technical knowledge needed.
C1	Designing the classroom of the future	Architects, designers, students (young and old), parents, school board officials, teachers.	Little to none. Some interact on a daily basis, but for operational, not design purposes.	Participants generate a few new concepts, with spaces better suited to students' different needs in class.
F1	Creating a new school following the planned merger of two schools	University management, deans, professors, researchers, support staff, students.	Little to none. Co-habit the same buildings; yet have never engaged in collaborative work.	3 concepts emerge, describing ideal worlds and narratives in which all stakeholders' needs are well attended to.

Results

Our data reveals co-design often emerge out of little prior relationships or out of weak ties, with some cases even supporting claims about the presence of underlying malfunctions and poor collaboration climate. It should be mentioned that some of the cases are still underway, and that

accordingly our attention is on the initial context and relationships between the stakeholders involved. Participants were usually sitting around the same table for the first time, and very few of them have any prior design or collaboration experience to account for. According to one of the project leaders in the H1 case: "this is an opportunity to really get to meet the colleagues and get out of this isolated environment". This case, just like the W1 workshop, where stakeholders have not had to work together before, but are now forced to do so is common across most of our data. On this point, the respondent in charge of the W1 case stated that before " there was enough funding for every project, but now they have to come up with an integrated and coherent plan, instead of all pulling in different directions". A claim echoed by one participant (E1), pointing out to the fact "doctoral students come different schools and never really talk to each other". Lack of personal interactions was also raised by one of the dean in the F1 workshop: " we must find ways to get back in touch with both students and local businesses, something we've lost lately". Prior relationships are not assessed by face time, for many stakeholders have met in the past without engaging in anything more than shallow conversations, let alone design activities. As the L1 facilitator explains: " participants had never really exchanged in the past. It's sad because they all work together, but don't interact very much in the end". As a result, cases such as W1 or GT1 show that relationships are improved or created during workshops. In the former, one participant was satisfied about having met "new people around her with whom to work again in the near future", while in the latter, the facilitator believed that the real outcome of the day was "creating mutual interest amongst participants".

Some participants also touched on the lack of trust and collaboration with their colleagues, or similar negative state-of-minds towards the group. The host of the C1 case used these words to sum up prior relationships amongst the stakeholders: "designers and architects see the parents, professors and students as hurdles, they feel as if involving them in the process will only slow things down and bring new problems". Along the same lines, another participant identified the challenges of dealing with "everyone (who) arrive initially with their own pet project or personal needs" and in finding ways to bring everything together. Finally, the host of the N1 case said that they used "co-design because of the economical and trust crises", adding that it was the only good way to go in order to "connect the top-down system with the bottom-up movement". These two cases, while working on projects that vary by scale and nature, were also both targeting

stakeholders or neighborhood facing harsher conditions; "the poor schools, not just the wealthy ones". Workshops, once again, aiming for the most difficult conditions possible.

Other cases raised even more dramatic or sensitive issues amongst stakeholders, with some of them confessing about the absence of meaning or coherence in their day-to-day activities. Workshops such as F1 or P1 had participants expressing feelings of uselessness in their job. The host of the latter case explained: "what we are going through here is a meaning crisis, for whom and why are we working in this organization?" Hence, improvements and regard for the "usefulness" feeling of participants were discussed in many cases. One elder in the MUT1 workshop discussed about spending "a fantastic day" in which she "felt really useful", a feeling echoed by a student in the A3 workshop: "we feel as if they really need us. It's not just cheap outsourcing of their (i.e. the client) innovation projects". Access to material and notes used in the planning of some cases also support our hypothesis by pointing out to sometimes conflictual or tensed settings. For instance, the ED1 animation protocol states that "the client should quickly go over the workshop introduction, to briefly set the stage and avoid raising the sensitive issues". The animation protocol also reads like this: "the facilitator will need to refocus the discussions and remind participants of what is sought after and allowed during the workshop". Protocol analysis further reveals that facilitation is equally, if not more, geared towards maintaining peace than designing new objects. Cases H1 and F1 for instance has the facilitator reminding participants early to resist from "falling pray to anger and pride", while the A2 protocol prompts everyone taking part in the workshop " to listen, avoid criticism (…) and respect the dignity of others". Such interesting guidelines and choice of words go far beyond the simple "withhold judgment" put forth in classic creativity approaches such as brainstorm (Osborn, 1963).

Respondents pointed out to different kind of gaps between what they wished to achieve (often expressed by the title of the workshop) and the current reality. Whether it was for an organizational structure ill suited for innovation "in which management usually does all the innovation and simply explains it to others after" as in the P1 case or a lack of relevant knowledge that leads the university (F1) dean " unsure of what to do to help students cope with today's changing environment". It can also just be that some participants have no or little design resources to spare, and as one facilitator puts it, "they come with their issue hoping one co-

design workshop will solve it". In other cases, such as GT1 or CS1, what is missing are common language, criteria or working methods. "They had no idea on how to work together" said the facilitator of the former, adding that "what they ended up creating where filters and criteria to assess the quality of concepts to come". For all A and O cases, organizations turn to co-design when they lack the proper knowledge or skills to conduct the activities internally. In the A3 case, participants from the sponsoring firm confessed that they not only needed outsiders and experts to weigh in on the technological dimensions of the product-to-be, but also extended interactions with users to help them sort out real needs from all the needs identified through market research. Finally, for cases such as H1 and E1, stakeholders do not lack knowledge or skills on the content of the workshop, but rather on the means to go about organizing collaboration in design. According to the E1 facilitator, "it seemed as if the participants were as much, if not more, interested in our animation protocol than we tried to achieve with it". While some stakeholders leave with the protocol, other leave with participants by recruiting them out of the workshop. Firms involved in A and O cases are systematically on the lookout for participants who could help them fill internal knowledge gaps beyond the one-day workshops. As the facilitator of the O2 case confessed, the firm is convinced that "if they identify one good talent to recruit, then their investment is worth every penny. At that point, reaching a working prototype just becomes a bonus". One participant from the A2 case even adds that organizations are "not even hiding the fact that they also use co-design as a recruiting-in-action tool".

Secondary data such as planning documents or animation protocols also provide another interesting element: the name of the workshop, or in other words, what brings the stakeholders together. Hence, most cases seem to display both a small level of ambition and a low novelty target. Workshops focusing on concepts such as "classroom of the future", "energy-efficient buildings" or "facilitating care for elders" are fields that have been thoroughly explored for some time already. The fact that stakeholders get to it only now could be interpreted as a symptom of their inability to get it before, when such considerations were still emerging. In other words, workshop "titles" are often an open window into the collective's "common problem", rather than their "common purpose". But while they do not suggest any real innovative outputs, the way the design work is being distributed amongst active stakeholder is in itself quite original. Other significant secondary data can be found in the design output, or lack there of as in most of our

cases. While many of them allowed for knowledge to be externalized, new functionalities to be identified and innovative fields (rather than precise innovation) to be suggested for later work, only 1 of our 21 cases (A3) yielded an artifact that could reach the market in the near future.

Hence, the results show that initial contexts and their underlying malfunctions vary. At the most simple level, our cases reveal that the problems may be of knowledge, skills or relational nature. These dimensions serve as first-level constructs, in which four different levels can be used to further define the tensions faced by the collectives. They may be affect individuals, organizations, institutions (value networks) or society at large (i.e. cities, territories). These problems are not mutually exclusive and can be embedded or interlocked with one another. Complex and deep-level tensions are not only signs that collaboration is unlikely, but that the need for facilitation amongst the stakeholder is essential to achieve any real design outputs. Table 2 presented below sums up these dimensions and levels built from our cases.

Table 2. Design collectives' initial malfunctions

Nature	Level	Manifestations (examples)
Knowledge	Individual	Loss of meaning
		Low motivation on the job
		Evolving roles
Skills	Organizational	No common criteria / methods
		Poor innovation structure
		Lack of specific skills
Relational	Institutional	Unsure of who to work with
		Mistrust
		Poor links with local partners
	Social	Wealth inequalities

Discussion

Based on our results, we argue that co-design should not be considered as a best practice, but rather as a crisis symptom. If it was indeed used to foster innovation and surpass classic methods to design new products or services, both the aim of the workshops and its results would support

such claims. More importantly, if co-design was only used as a way to facilitate dialogue and build better teams, we would not still find real design tasks and expectations that bring stakeholders together. Rather, our results suggest that groups resort to co-design only when crises undermine their ability to collectively create using conventional approaches. Workshops, it seems, are used as Trojan horses: getting design collectives operational (again) by working on the design of products or services. As Godet (1977:21) argues: "action accelerates change". In our cases, designing together fosters change amongst stakeholders. And as such, co-design rises in a field that tends to respond to crises by inventing new methods, modes of organizing and management principles (Mahmoud-Jouini & Midler, 1999).

Resorting to the word "crises" is certainly not neutral: it holds a meaning often seen as dramatic and negative. This choice of words stems from both interviews excerpts, where some participants raised "meaning" (case P1) or "trust" (case C1) crises, and from existing innovation literature (e.g. Godet, 1977; Mahmoud-Jouini & Midler, 1999; Spina et al. 2002). Scharmer (2009:2) argues that «the crisis of our time reveals the dying of an old social structure and way of thinking, an old way of institutionalizing and enacting collective social forms». The difference here is that we highlight crises not just to describe the initial setting in which the innovation or design efforts unfold, but actually as the sine qua non condition in which it can take place. By crisis, we simply point out to, as Godet (1977:20) said, "a gap between reality and aspirations". In a collaborative design setting that aspires to innovate, the gap lies in the lack of prior relationships between the participants and the absence of experts or innovation credentials around the table. Contrary to the literature on proper innovation settings, co-design occurs where there is little potential for collaboration. Yet, while tensed context are known to hinder innovation (Clauß, 2012), our cases show that stakeholders push through and keep on co-designing. It seems outcomes such as stronger ties, learning and change trump design outputs.

The change management literature can help us better understand co-design if it is indeed an intervention to a crisis, although it remains different on many levels. For one, co-design does not always target pre-existing and stable collectives (such as a team or an organization), but rather disgruntled individuals often coming together for the first time. Not does change management seek to regroup individuals: its purpose is to capitalize on "common purpose" and "shared

values" as accelerators of organizational progress (Roy, 2010: 48). And while change management is about «moving from strategic orientation to action» (Rondeau et al. 2005:7) and helping individuals cope with disruption (Rondeau, 1999), co-design appears to be moving from action to strategic orientation, by not focusing on the change itself but rather on what needs to be designed by the collective. Such interventions are not seeking to bring change according to precise plans, to a level where higher-level activities such as design and innovation can be better executed. As change-management guru Kotter (1995:12) advocates, research has demonstrated that only "one or two years into transformation (can we) witness the introduction of new products". What co-design seems to do, on the contrary, is operating change for and by design, meaning innovation activities precede the existence of a proper collaboration setting. As such, our results do not expand on existing change management approaches; they suggest an entirely new one. While "much of the literature on organizational change is concerned with how managers can intervene to pre-empt these crises before they occur" (Bilton, 2007:34), we put forth the idea that they should not only occur, but be used for innovation purposes and solve to collaboration engagement in design activities.

If this holds true, collectives – and especially their underlying malfunctions – should no longer been considered as mere inputs in the design of new objects, but on the contrary, as an important result of the design activity. Rather than treating collectives as in an input of design, our cases suggest a reversed outlook where design becomes an input of collectives. Hence, controlled disruption through co-design is not only possible, but desirable in order to fulfill both design targets and renewed collectives. It thus becomes a new managerial tool for bringing about change, not just new objects. According to Hatchuel (2001), advances in management are precisely responses to difficulties of collective actions. Such outcomes on the collective are not taken into account by the existing design literature. For instance, Hatchuel et al. (2011) identify five potential design outputs: research questions, products, emerging concepts, skills and knowledge. While it could be said that the two last dimensions are improved along the way, a new design collective should be seen as a desirable outcome of its own.

Implications

This discussion raises in turn an important question: why then do we co-design if not to design? Solving crises, (re) creating design collectives, exchanging knowledge, building foundations for later work: these are all legitimate, yet unsung co-design outcomes. Knowing that innovation and its subversive nature can disrupts collectives (Hatchuel & Pallez, 1997), co-design can be used a "controlled disruption" that bonds people together through design activities. Again, if this holds true, then we must also revisit criteria used to assess its performance by including dimensions not only on the new objects, but also on the new collectives. As one workshop organizer told us: " the real success lies in knowing which citizens to mobilize for future projects (…) this came a bit as a surprise, but it represents an enormous potential". Creation of a design collective does not mean that the exact same individuals will be involved the next time around, only that the workshop participants benefit from increased awareness, mutual consideration and minimal knowledge that can be used in future projects in which they all hold stakes. For the innovation manager of the "A" cases, co-designing has translated into new design automatisms, where such workshops are now to be held "systematically in any project that are heavily client-centered". While prior work has addressed the links between innovation and change (e.g Hendersen & Clark, 1990; Kim & Mauborgne, 1999), the latter is often described as the primary and intended target of interventions on the former. What we put forth here is the idea that change is the indirect, yet most important, outcome of co-design. What's more, it's specificity and strength is that this change in mediated by the new objects, which should still be pursued.

Figure 2. What co-design looks like based on empirical evidence.
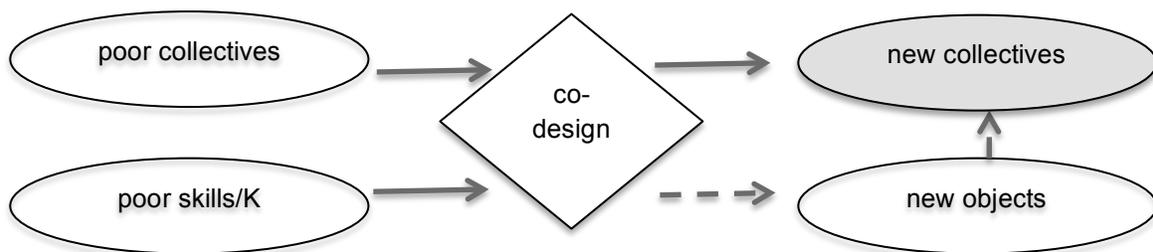
Rather than treating it as a handicap, the lack of prior relationship can be turned into an asset. Organizations should not give up or delay innovation efforts, as poor contexts may turn out to be quite conductive for new collectives and ideas to emerge. According to Morin (1976), crisis highlight flaws and opportunities, but more importantly trigger actions that lead to new solutions. The author adds, as Shumpeter (1939) before him, that "within the destruction of crisis lies creation". For the existing literature on co-design fails to account for relationships and focuses on the new objects, we argue that the complexity of current innovation issues call for more of such design interventions that create both tangible outputs and relationship outcomes. In terms of practical implications, our results offer a reversed outlook on the organizational change or configuration for innovation reasoning. While we have known for some time now that innovation and design can trigger change (Schott & Müller, 1975; March 1981), our understanding of co-design takes it one step further, making the case that such disruption can be purposefully introduced and managed as a mean to bring about desired changes in disgruntled groups or dissembled collectives. Starting from the proposition that design can help cope with collaboration issues, organizations can envision new means to bring about change through such activities. Moreover, knowing co-design activities need some sort of crisis to emerge, practitioners may want to hold back on hosting workshops in positive settings in which they are unlikely to bring about changes on collectives, that is if they don't result in negative outcomes.

As Noteboom (2000:76) explains, «people can collaborate without agreeing, (but) it is more difficult to collaborate without understanding, and it is impossible to collaborate if they don't make sense to each other». Hence, starting from a difficult context where collaboration is unlikely, it appears as if engaging in design activities allows not for complete agreement, but at least in the construction of a common repertoire of practices and references. Most cases studied here fail to produce significant design outputs, however most hold the promise of subsequent tangible results. Hence, based on classic transaction-cost economics, this "two-time" collaboration dynamic depicts the first co-design workshop as the investment phase, whereas subsequent workshops allow for tangible return (design outputs) to emerge. In that sense, participants or organizations disappointed about co-design could be compared to risk-averse or impatient investors pulling out too soon of the market. This mean that organization should not have to simply resort to hybrid weak-and-strong ties configurations (Uzzi, 1997), but rather

adopt a sequential approach to strengthening weak ties through design activities and then mobilizing this more cohesive collective towards solving innovation issues. Briefly put, it may be the answer to the paradox of embeddeness: strong ties can indeed lead to innovation, but only when the ties have first been built or mediated through the co-construction of a common object.

Limits and Future Research

Lastly, our research design holds two methodological limits that ought to be discussed. First, the use of retrospective cases holds the risk of historical distortions and maturation. Second, discussing crises, albeit not in such terms, with participants may at times have raised sensitive issues. To minimize the impact of both time and emotions, we interviewed a wide array of participants and centered our questions on specific instances of the workshop (Hubert & Power, 1985). More importantly, we relied on secondary sources used in the planning or the facilitation of the workshop in order to assess contexts without falling into data maturation traps.

Future research on collaborative design activities should pursue the ongoing theorization of co-design and extend on this paper by conducting a larger-scale quantitative paper on relationships before and after workshops. It ought to further define the nature of the ties between stakeholders, and its evolution as they go through collaborative design. More importantly, future research should seek longitudinal cases in which repeated workshops would allow to further validate our claims on the "design-co-design" sequence required to reach innovative design. Finally, other dimensions of the workshop that may influence both design outputs and collective outcomes such as animation protocols, formats or goals (what products, services or processes should collectives with poor relationships attempt to design?) should also be further studied.

Conclusion

Puzzled by both theoretical and empirical inconsistencies about what is to be expected from co-design, we conducted this multiple case study hoping to better understand the contextual elements and different results of collaborative design workshops. Our data has shown that co-design's natural environment was one of crisis, whether of knowledge, skill or relational nature. Rather than seeing this situation as a hurdle for collaboration or an impossible setting for

innovation, we have argued that it could on the contrary be overcome through the engagement of stakeholders in design activities and used as a leverage to change management. Results also point out to a sequence in which initial weak ties are strengthened by design, which in turns can lead to new objects to be designed by strong collectives. As a consequence, we have advised organizations to tackle internal or network malfunctions through innovation first, rather than addressing innovation issues only once the collective has reached collaboration maturity.

References

Adler, P. & Heckscher, C. (2006). Towards collaborative community. The firm as a collaborative community: Reconstructing trust in the knowledge economy.

Berger, C., Möslein, K., Piller, F., & Reichwald, R. (2005). Co-designing modes of cooperation at the customer interface: learning from exploratory research.European Management Review, 2(1), 70-87.

Bilton, C. (2007). Management and creativity: From creative industries to creative management. Blackwell Pub.

Burt, R.S. (1992) Structural Holes: The Structure of Competition, New York: Academic Press.

Burkhardt, D. & Ittelson, W. (1978) NATO Special Program Panel on Human Factors, & NATO special Program Panel on Systems Science, Environmental assessment of socioeconomic systems, Plenum Press.

Chesbrough, H. W. (2003). Open innovation: The new imperative for creating and profiting from technology. Harvard Business Press

Christensen, C. (1997). The Innovator's Dilemma. Harvard Business School Press, Boston, MA.

Clauß, T. (2012). The Influence of the Type of Relationship on the Generation of Innovations in Buyer–Supplier Collaborations. Creativity and Innovation Management, 21(4), 388-411.

Coleman, J. S. (1957) Community conflict. New York: Free Press.

Coleman, J.A. (1988) Social Capital in the Creation of Human Capital. American Journal of Sociology 94, S95-S120.

Da Mota Pedrosa, A. (2012). Customer Integration during Innovation Development: An Exploratory Study in the Logistics Service Industry. Creativity and Innovation Management, 21(3), 263-276.

Edmondson, A. McManus, S. (2007). Methodological fit in management and research field. Academy of Management Review 32 (4), 1155-1179.

Diener, K. and Piller, F. (2010). The Market for Open Innovation. Raleigh, Lulu.

Dyer JH, Nobeoka K. (2000). Creating and managing a high performance knowledge-sharing network: the Toyota case. Strategic Management Journal 21(3): 345–368.

Eisenhardt, K. M. (1989). Building theories from case study research. Academy of management review, 14(4), 532-550.

Eisenhardt, K. & Graebner, M.(2007). Theory building from cases: opportunities and challenges. Academy of Management Journal 50 (1), 25-32.

Evenson, S. (2005). Designing design: Establishing a new common ground for collaboration, 11th International Conference on Human-Computer Interaction: Interaction Design Education and Research: Current and Future Trends,. 22-27.

Garel, G., & Mock, E. (2012). La fabrique de l'innovation. Hachette.

Glasser, B. G., & Strauss, A. L. (1967). The development of grounded theory. Alden,

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. American Journal of Sociology, 91: 481–510.

Granovetter, M.S. (1973) The Strength of Weak Ties, American Journal of Sociology, 78(6): 1360-80.

Godet, M., & Lesourne, J. (1977). Crise de la prévision, essor de la prospective: exemples et méthodes.

Hatchuel, A. (2001). The two pillars of new management research. British Journal of Management, 12(s1), S33-S39.

Hatchuel, A., & Pallez, F. (1997). Services publics: la Subversion par les nouveaux produits. Revue française de gestion, (115), 84-94.

Hatchuel, A., Le Masson, P., & Weil, B. (2011). Teaching innovative design reasoning: How concept-knowledge theory can help overcome fixation effects.Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 25(1), 77-92.

Henderson, R. & Clark, K. (1990). Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms. Administrative science quarterly, 9-30.

Hinde, R. (1997). Relationships: A dialectical perspective. Hove, UK: Psychology Press

Holzer, J. (2012). Construction of Meaning in Socio-Technical Networks: Artefacts as Mediators between Routine and Crisis Conditions. Creativity and Innovation Management, 21(1), 49-60.

Hubert, G. & Power, D. (1985). Retrospective reports of strategic-level managers: Guidelines for increasing their accuracy. Strategic Management Journal, 6(2),171-80.

Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. The Journal of Marketing, 42-54.

Huxham, C. (Ed.). (1996). Creating collaborative advantage. Sage.

Janis, I. L. (1972). Victims of groupthink. Boston: Houghton-Mifflin.

Katz, R., & Allen, T. J. (1982). Investigating the Not Invented Here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R & D Project Groups. R&D Management, 12(1), 7-20.

Kim, W. C., & Mauborgne, R. (1999). Strategy, value innovation, and the knowledge economy. Sloan management review, 40, 41-54.

Kirton, M. J. (1984). Adaptors and innovators—Why new initiatives get blocked. Long Range Planning, 17(2), 137-143.

Kleinsmann, M., Valkenburg, R., & Buijs, J. (2007). Why do (n't) actors in collaborative design understand each other? An empirical study towards a better understanding of collaborative design. CoDesign, 3(1), 59-73.

Koskinen, I., Battabee, K., & Mattelmäki, T. (2003). Empathic design: User experience in product design. Helsinki: IT Press.

Kotter, J. (1995). Leading change: Why transformation efforts fail. Harvard business review, 73(2), 59-67.

Le Masson, P., Hatchuel, A., & Weil, B. (2011). The interplay between creativity issues and design theories: a new perspective for design management studies?. Creativity and Innovation Management, 20(4), 217-237.

Luke, A. (2012). Co-designing Services in the Co-futured City. Service Design: On the Evolution of Design Expertise. Lahti University, Research reports,16, 101-120.

Lusch, R. F., Vargo, S. L., & O'Brien, M. (2007). Competing through service: insights from service-dominant logic. Journal of retailing, 83(1), 5-18.

Mahmoud-Jouini, S. & Midler, C. (1999). Compétion par l'innovation et dynamique des systèmes de conception dans les entreprises françaises-Une comparaison de trois secteurs. Entreprise et Histoire, (23), 36-62.

March, J. G. (1981). Footnotes to organizational change. Administrative science quarterly, 26(4),563-577.

Mattelmäki, T., Brandt, E., Vaajakallio, K. (2011), «On designing open-ended interpretations for collaborative design exploration», CoDesign, 7(2), 79-93.

Morin, E. (1976). Pour une crisologie. Communications, 25(1), 149-163.

Nooteboom, B. (2000). Learning by interaction: absorptive capacity, cognitive distance and governance. Journal of management and governance, 4(1-2), 69-92.

Olson M. (1966), Logique de l'action collective, Paris, PUF, 1978.

Osborn, A. (1963) Applied Imagination, principles and procedures of creative problem-solving, Charles Scribner & Sons.

Piller, F. (2004). Mass customization: reflections on the state of the concept. International Journal of Flexible Manufacturing Systems, 16(4), 313-334.

Piller, F, Ihl, C., & Vossen, A. (2011). Customer Co-Creation: Open Innovation with Customers. Wittke, 31-63.

Raymond, E. (1999). The cathedral and the bazaar. Knowledge, Technology & Policy, 12(3), 23-49.

Remneland-Wikhamn, B., & Knights, D. (2012). Transaction cost economics and open innovation: implications for theory and practice. Creativity and Innovation Management, 21(3), 277-289.

Remneland-Wikhamn, B., & Wikhamn, W. (2011). Open innovation climate measure: The introduction of a validated scale. Creativity and Innovation Management, 20(4), 284-295.

Rondeau, A (1999). Transformer l'organisation : Vers un modèle de mise en œuvre, Revue Gestion, 24 (3), 148-157.

Rondeau, A., Croteau, A. M., & Luc, D. (2005). Une appréciation empirique des enjeux technologiques et de transformation liés au déploiement de l'administration électronique au Québec. Systèmes d'information et management, 10(1), 63-76.

Rowley T, Behrens D and Krackhardt D (2000) Redundant Governance Structures: An Analysis of Structural ad Relational Embeddedness in the Steel and Semiconductor Industries. Strategic Management Journal, 21: 369-86.

Roy, M. (2009). Créer une communauté stratégique pour favoriser le changement: cas portant sur l'organisation du travail dans le secteur de la santé. Gestion, 34(4), 48-54.

Sanders, E. & Stappers, P. (2008). Co-creation and the new landscapes of design, CoDesign, 4(1), 5-18.

Saxenian, A., & Sabel, C. (2008). Roepke Lecture in Economic Geography Venture Capital in the "Periphery", Economic Geography, 84(4), 379-394.

Scharmer, C. O. (2009). Theory U: Learning from the future as it emerges. Berrett-Koehler.

Schuler, D., & Namioka, A. (1993). Participatory design: Principles and practices. CRC Press

Schumpeter, J. (1939). Business cycles (Vol. 1, pp. 161-74), McGraw-Hill.

Schott, B. & Müller, W. (1975). Process innovations and improvements as a determinant of the competitive position in the international plastic market. Research Policy, 4(1), 88-105.

Schwarz, M. & Krabbendam, D. (2013) Sustainist Design Guide, BisPublishers.

Shah, S. & Corley, K. (2006). Building Better Theory by Bridging the Quantitative–Qualitative Divide, Journal of Management Studies, 43(8), 1821-1835.

Spina, G. Verganti, R. Zotteri, G. (2002) Factors influencing co-design adoption: drivers and internal consistency, International Journal of Operations & Production Management, 22 (12), 1354-1366

Stewart, J. & Hyysalo, S. (2008). Intermediaries, users and social learning in technological innovation, International Journal of Innovation Management, 12(3) 295-325.

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. Strategic management journal, 28(13), 1319-1350.

Thomke, S. (2003). Experimentation matters: Unlocking the potential of new technologies for innovation, Harvard Business School Press.

Uzzi B. (1997) Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness, Administrative Science Quarterly, 42(1): 35-67.

von Hippel, E. (1986). Lead users: a source of novel product concepts, Management science, 32(7), 791-805.

von Hippel, E. (2005). Democratizing innovation. Cambridge, MA: MIT Press

von Krogh, G., Rossi-Lamastra, C., & Haefliger, S. (2012). Phenomenon-based Research in Management and Organisation Science: When is it Rigorous and Does it Matter?. Long Range Planning, 45(4), 277-298.

Wixon, D., Holtzblatt, K., & Knox, S. (1990). Contextual design: an emergent view of system design. In Proceedings of the SIGCHI conference: Empowering people, ACM, 329-336

Xie, J., Song, M., & Stringfellow, A. (2003). Antecedents and consequences of goal incongruity on new product development in five countries: A marketing view. Journal of Product Innovation Management, 20(3), 233-250.

Yin R. (1994) Case study research. Design and methods. Thousand Oaks: Sage Publications.