Routledge
Taylor & Francis Group

The Design Journal
An International Journal for All Aspects of Design

ISSN: 1460-6925 (Print) 1756-3062 (Online) Journal homepage: https://www.tandfonline.com/loi/rfdj20

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**To cite this article:** Lizette Reitsma, Ann Light, Tariq Zaman & Paul Rodgers (2019) A Respectful Design Framework. Incorporating indigenous knowledge in the design process, The Design Journal, 22:sup1, 1555-1570, DOI: 10.1080/14606925.2019.1594991

**To link to this article:** https://doi.org/10.1080/14606925.2019.1594991

EAD 2019

*Running with Scissors, 13th International Conference of the EAD, University of Dundee, 10-12 April 2019*

# A Respectful Design Framework.
## Incorporating indigenous knowledge in the design process

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**Abstract:** To stay within the planetary boundaries, we have to take responsibility, and this includes designers. This requires new perspectives on design. In this work, we focus on a co-design project with indigenous communities. Within such communities, indigenous knowledge is central. Indigenous knowledge acknowledges that the world is alive and that we, as humans, are merely a small part. Central in our approach is Sheehan's respectful design, which ensures a central place for indigenous knowledge in the design process. However, Sheehan's approach does not state in pragmatic terms how such a design approach can be achieved. Some of the co-design processes we engaged in led to respectful design spaces, others did not. This helped us to identify patterns of dynamics that are essential for respectful design. At the core of our findings lies the observation that in order to reach a respectful design space, in which indigenous knowledge is embedded, a shared dialogical space between community and designer is essential.

**Keywords:** Co-Design, Indigenous Knowledge, Communities, Design Approach, Ownership

# 1. Introduction

We have entered the Anthropocene, the present geological epoch in which humans have more impact on the planet than all other factors combined (Grinspoon, 2016). To stay within the planetary boundaries, we, as designers, will have to take responsibility (Grinspoon, 2016, Light *et al.*, 2017 and Irwin, 2015). One approach is to challenge the prevailing Western culture which has led to a human-nature dualism. In this worldview, nature is constructed as radically different from the human (Hall, 2011).

In this work, we focus on a co-design project with indigenous communities. Indigenous communities closely identify themselves with the natural systems within which they live. They would not separate themselves from those systems.

The use of design within the context of indigenous communities raises concerns. This has to do with the characteristics of design to 'improve' lives and its emphasis on innovation. Both these characteristics increase the probability that design will colonise. We thus have to find ways to deal with such concerns, especially when working with groups where the notion of colonisation is sensitive.

Both Sheehan's (2011) respectful design and Tunstall's (2011) culture-based innovation acknowledge these concerns and deal with them in the context of working with indigenous communities. Both position the indigenous knowledge system at the heart of their approach. Central to both approaches is that the community should be the main beneficiary of the project. However, neither of the approaches state in pragmatic terms how such a respectful design space can be facilitated. Therefore, the aim of this research was to explore the dynamics of a respectful design space in co-creative and co-reflective encounters with indigenous communities in which indigenous knowledge is assured a central position.

# 2. Background

Within indigenous communities, indigenous knowledge is central. According to Sheehan (2011), indigenous peoples do not believe they stand above other things in the world but are merely a small part of a greater whole. They see the world as being alive, a complex holistic system. Indigenous knowledge is specific knowledge intertwined with place (Warren, 1991) and it resonates a long history of fine-tuning responses to the environment (Marsden, 2005), thereby supporting holistic interaction between humans and their environment. We have to understand that we, as designers, will not be able to grasp the complexity of the indigenous knowledge system. Given this situation, how can we still ensure a central place for it within the design work?

## 2.1 Participatory design in non-Western contexts

At the heart of much participatory design lies the principle that the stakeholders and communities co-direct the process with designers. However, there are challenges specific to working on projects within multi-cultural contexts, as has been vocalised by researchers working within this field (for example, Puri *et al.*, 2004; Dearden and Rizvi, 2008; Oyugi *et al.*, 2008; and Winschiers-Theophilus *et al.*, 2010).

One of these challenges lies in balancing power within a multicultural context (Bauman, 2011). Camara *et al.* (2008) introduced this problem through a case-study. They performed participatory design work with both a Tanzanian and a Swedish community. Whereas in Sweden, the participants took the lead; the designers seemed to dominate in the Tanzanian case.

This is why Winschiers-Theophilus *et al.* (2010) introduce the concept of 'being participated' as a researcher. In this approach, the designer should not exclusively hold leadership roles. They highlight that the process of establishing participation is an emergent process that is negotiated *in situ*. Without a democratic focus, in which the power balance is as equally divided as possible, there is no true participatory design. Even though we agree with Winschiers-Theophilus *et al.* (2010) that the true dynamics should be negotiated *in situ*, we also realise that it is important to have an attitude towards equal participation beforehand, in order to be able to create space for this negotiation to take place.

## 2.2 Third spaces

When embarking on cross-cultural projects, it is easy to end up speaking and thinking culturally in binary: Western versus non-Western, myself versus 'the other'. When looking at those binaries in relation to the past and post-colonialism, they suggest a strong hierarchical division. To attempt to balance out those hierarchies, a liminal third space can be created. A third space is a space in which there is no dominant identity, or in which the dominant identity is not the person coming from outside the community (e.g. the external (design) researcher). It is built up from attributes brought in by the different actors (Muller & Druin, 2008). Those attributes are dynamic, shaping unpredictable and changing combinations within the third space. Such a space is important to help balance power. Both community members and external researchers may find that throughout the design process, their needs and constraints are shaped and changed. Potentially, the differences between them can become smaller. In this way, a cultural hybridity can arise that embraces differences without an assumed or imposed hierarchy (Bhabha, 1994).

The notion of cultural hybridity is about challenging static cultural binary oppositions. By challenging these oppositions, a more nuanced approach towards understanding culture is offered. Hybridity helps to soften the differences between the self and the cultural other. Consequently, otherness becomes a dynamic concept, rather than a static concept (Merritt & Stolterman, 2012). According to Merritt and Stolterman (2012), interaction and context inform hybridity. This is related to looking at co-design as a conversation, based on Winograd (1987), in order to stimulate cultural hybridity. Such a conversation is a co-ordinated sequence of acts that have meaning and that can be interpreted as such. This meaning does not necessarily have to be linguistic. Jones *et al.* (2007) and Iversen *et al.* (2012) explore co-creative processes as a conversation, adopting David Bohm's theory of dialogue (Nichol 2003). According to this theory, people take a position within a dialogue and keep this position relatively static. Even though this position is negotiable, people often hold on to their stances in ways that preclude negotiation. It is for this reason that something needs to intervene to create a negotiable dialogical space.

## 2.3 Ownership

Both Tunstall (2011) and Sheehan (2011) stated that in the approaches they propose for working with indigenous communities, one of the key factors is that the community can direct the process and the project direction. In order to facilitate for the community to do this, ownership is an important notion.

Taking ownership of something provides people with the ability to take control and explore and alter their environment (White, 1959; Furby, 1978a; Furby, 1978b; Furby, 1980; Csikszentmihalyi & Halton, 1981; Rudmin & Berry, 1987; and Beggan, 1992). Conversely, objects that cannot be controlled do not provide space to take ownership of them (Lewis & Brook, 1974; Seligman, 1975). This is what Wang *et al.* (2006) call the instrumental motive of ownership. This instrumental motive of ownership is related to ownership of the process. Things that are created by individuals are more likely to raise feelings of ownership by those individuals (Das, 1993). Similarly, having intimate knowledge and information about something can result in having a stronger relationship with it (Beaglehole, 1932). Therefore, by shaping, creating or producing things, it is likely that we feel like we own it (Csikszentmihalyi & Halton, 1981).

In this work, we acknowledge different types of ownership, in order to understand the different dynamics of the respectful design process. These four types of ownership are, ownership of process, ownership of outcome, ownership of ideas and ownership of material culture that is introduced in

order to intervene so as to create a negotiable dialogical third space. Below, we consider each in detail.

## OWNERSHIP OF PROCESS

We realised that it is important to understand the type of design participation in order to understand who is in charge of the process.

In Lee's framework of design participation tactics (2006; 2008), the focus lies on who is in control in each stage of the project. The design participation types, innovation, collaboration and emancipation are all initiated by the designer. However, the relationship between community and designer is different. Innovation is positioned in the designer's space. The designer's role is that of a design expert. The role of the community is that of representatives of a group. Collaboration is positioned within a shared space of the community and the designer. Both innovation and collaboration are mission-oriented. The goal is to obtain information and data that then can be used for the design. The role of the designer in a collaborative type of design participation is that of a co-designer or facilitator. The role of the community is that of co-workers. It is about designing for people, instead of with people. This is different for emancipation. It is positioned in a shared space, like collaboration, but is focused on designing with people. The role of the designer is that of trigger. The role of the community is to be creative or to advise. Motivational design participation is the only type of design participation that is positioned completely within the community's space. The designer is a crafter or builder in such a process; the community is the active client. The community has autonomy to steer the design process. Thus, connected to respectful design, the ultimate goal then can be to reach a motivational design participation.

## OWNERSHIP OF OUTCOME

In cases where the community members can control the process, it can be expected that they perceive ownership. This perceived ownership can be signalled. Wang *et al.* (2006) refer to this as the perceptive, social-cognitive motive of ownership. Through this signalling motive it becomes clear who owns what, so that no misconceptions can arise. Because of this signalling, meant to make others aware of our perceived ownership, you can 'read' ownership. The people owning the object can express ownership and ownership can be marked on the object that is taken ownership of. In understanding who controls the project, it is important to understand these signals, as they give additional information about the potential of establishing a respectful design space. Examples of how ownership is signalled include the expression of pride and taking responsibility.

## OWNERSHIP OF IDEAS

Knowing who contributes with ideas, and what those ideas look like, is important for understanding where the balance of power lies within the co-creative space. Unsworth (2001) introduces a matrix with four different creativity types in which she distinguishes between creativity types by the problem type (open vs. closed) and the driver of engagement (external vs. internal). Since creativity, as a term, is ambiguous and suggests a successful outcome, we altered Unsworth's terminology from creativity types to 'novel expressions', as introduced by Csikzentmihalyi's (1996). Each novel expression is a new idea within a certain context. However, it does not necessarily have to be taken up and implemented. It, thus, does not just highlight the successful cases, but rather shows who is contributing with new ideas and what kind of ideas these are.

External engagement refers to external designer-driven engagement, internal refers to community-driven engagement. Expected novel expressions and responsive novel expressions are the type of expressions that are driven by the external designer. They refer to a required solution to either a

discovered problem (expected – e.g. a commissioned artwork) or a specified problem (responsive – e.g. responses produced by a think tank). Proactive and contributory novel expressions are community-driven. They refer to a volunteered solution to either a discovered problem (proactive – e.g. unprompted suggestions) or a specified problem (contributory – e.g. a contribution by a non-project member).

**OWNERSHIP OF MATERIAL CULTURE**

The creation of objects - and the objects themselves - function as a method to order the mind (Csikszentmihalyi and Halton, 1981; Csikszentmihalyi, 1993; and Miller, 2011). Both the object and the process of co-creation can serve as ways to provide a space in which the different participants can explore and negotiate their needs and constraints (Goffman, 1959). Co-created objects are representations of identity and thus can be seen as material presenters of the evolving third space (Björgvinsson *et al.*, 2012). Through co-creation, the aim is not for the external designer to get an understanding of the community to base design upon. Rather, it is about developing a dialogical space between the community members and external designers and the artefacts present and to be created. This is what Ehn (2008) refers to as a socio-material assembly. In such an assembly of humans and non-humans, it is about shaping and staging each actor.

# 3. The Study

We have taken a field approach to research-through-design (Koskinen *et al.*, 2011), using a case study (Yin, 2009) as a foundation to the research presented in this paper. The design process was analysed as part of the research process. In this section we introduce the case study. In the next section, we focus on the research process in more detail.

## 3.1 Initial Visits

In an attempt to avoid imposing a project upon an indigenous community, the design process started with preliminary visits to a range of indigenous communities in Sarawak, Malaysia, to find a partner that had a desire to experiment culturally. We had the intention to start a project focusing on material culture and cultural heritage but were open to whatever directions the communities showed interest in. The communities where approached by the third author who has a long-term partnership with those communities. He asked whether they would be interested in jointly exploring collaboration possibilities. Three communities welcomed the designer (the main author) and the third author for a visit focusing on such explorations. During these visits, flexible design probes were introduced by the designer, through which the communities and she co-creatively explored beneficial design directions (see Reitsma *et al.* (2013) for more detail). This was done in a casual, noncommittal manner, so the community could explore whether they were interested in participating and on which grounds. One of three communities, Long Lamai, became particularly interested in co-operating on a design project.

The designer then travelled back to her usual place of work in Britain and translated the design probes, and her observations through her research diary, into what she perceived to be a beneficial design direction based on her encounter with the Long Lamai community. She further translated this understanding into new design probes. With those new design probes, she aimed to stimulate intergenerational conversations about Penan identity. Those design probes contained adaptable electronics (e.g. microcomputers and sensors) and could be altered in the co-creative process. She chose this type of probe because the community showed interest in the technology in her previous

*Figure 1. The exhibition pieces: A musical instrument – Lakat Tesen (left) and the Lights – Batu'Nue (right).*

work. Through these probes, she aimed to encourage people in her new partnership to reflect on their perceived connection to their cultural identity.

Both financial conditions and the desire for access to contemporary technological materials meant that this preparation was handled remotely. For this and reasons of inclusivity, it was conceived to be embryonic, more a test of the designer's grasp of the situation than a preliminary stage of any design.

## 3.2 Co-creative visits

The designer next returned to Long Lamai, a year after the preliminary visits, to start the co-creative encounters. She stayed in the community for three different co-creative encounters, each of a different length.

The designer introduced the design direction that she had synthesized from the observations and design probes of the preliminary visits, through the new technological design probes.

The design direction, however, was considered to be taboo. Intergenerational discussion of identity in the community is inappropriate. Since she had introduced the design probes with the design direction embedded in them, they could not be used as intended as probes.

However, the community found the items interesting in themselves. They assigned value to the probes as instances of technology, and therefore these probes ended up with a central role in the design process in spite of this failure. (We can observe, as an aside, that this is yet another demonstration that the design of an intervention is never without impact. The whole project might have developed differently with a different material starting point.)

## 3.3 Overview of Artefacts

The design direction changed, through negotiations, to: creating technological exhibition pieces to introduce Penan identity to people from outside the community. More details of this process can be read in Reitsma *et al.* (2014), but here we give an overview. The external researcher worked with the

elders of the community to look at what cultural issues were important to them and how a person with no status except being a visitor might usefully support their ambitions in this area. It turned out that image management in the region was something of concern. Technology, it was felt, would allow the Penan people to show both their progressive thinking and communicate their culture in the process of harnessing cutting-edge Internet of Things artefacts.

Based on a suggestion from the community, the technological design probes became exhibition pieces for show at a region-wide meeting of Sarawak communities, the eBario Knowledge Fair. Since 2007, this biennial event is organised by the Institute of Social Informatics and Technological Innovations of the Universiti of Malaysia Sarawak. Its aim is to bring together the indigenous communities, researchers, policy makers and development practitioners, in order to provide space for dialogue between them. (Zaman *et al*., 2015). Those exhibition pieces (see Figure 1) were:

- a website,
- a musical instrument technology probe that would play every time someone accessed the website, and
- light bulbs that would start glowing every time a new message was posted on the website.

Through a process of transformation, discussed below, the lights became 'Batu'Nue', which means fireflies in the Penan language. The Penan are famous for their basket making and the lampshades, made as baskets, reflect traditional basket-making techniques. The materials directly represent the Penan's vivid relationship to the rain forest. The musical instrument exhibit became 'Lakat Tesen' (the name of the king of the cicadas). This was based on a local instrument, the Pagang. In the technological transformation of the Pagang, the community wanted to show that they are open to change, but that they will take life lessons from their ancestors. Each of those technology probes had its own design process. In Reitsma *et al.* (2014) the design process of the exhibits is presented in more detail.

## 3.4 Pilot Exhibition

During a pilot exhibition, the community came up with narratives for the exhibits, taking their investment in production of the artefacts to a new level. However, it was not only the people who had taken part in the production of the artefacts, but also other people, who - until that point - had had nothing to do with the project who appropriated the designs. This appropriation into the local culture happened spontaneously as people were considering how to account for their work. They took ownership of the exhibits that surfaced during the final exhibition at the eBario Knowledge Fair. The community took responsibility for setting up the exhibition and exhibits and for introducing them to the audience.

# 4. Methods

To understand what a respectful design space entails, and which attitudes should be adopted, we examined the data that arose from the designer's interactions with the Long Lamai community. This data was collected as written research diary entries and visual research diary entries (photo diaries). The aim was to find patterns in these entries over time, in relation to shaping a respectful design space. Furthermore, we wanted to be able to compare whether the visual entries gave similar outcomes to the written entries. At the same time, the analytical process was meant to understand what the relations were between events that took place and the designer's attitude within the process in relation to a respectful design space. We reviewed the literature to determine more

specifically what the coding concepts entailed. For each of those coding concepts, we searched for existing analytic frameworks. For some, relevant frameworks were found in literature, which we adjusted slightly; for others, we shaped new frameworks from information in existing literature. The frameworks that were defined became the foundation for finding patterns within the data. The coding concepts became:

1. ownership as design participation;
2. indicators of psychological ownership;
3. novel expression types;
4. material culture and;
5. glimpses of indigenous knowledge.

Using the coding concepts, we deduced codes from the written entries through content analysis (Urquhart, 2013) and from the visual entries through annotated portfolios (Gaver & Bowers, 2012). We were searching for an analysis tool that provided synergy between those verbal and visual forms and that showed changes and patterns through the course of the process. Since we did not find a tool that was suitable in combining verbal and virtual forms through timelines, we used different tools and combined those into a new tool. This tool complemented graphical annotated portfolios and timelines with different layers understanding (see Reitsma 2015 for the graphical timelines and portfolios). By adding layers to the initial analysis method, we created new opportunities for reflection. An example of these added layers of understanding, were overviews that we call pattern sheets. These enabled us to compare the appearance of the coding concepts between each of the stages for each design activity. In this paper, we present simplified versions of the pattern sheets for design participation (Figure 2), novel expressions (Figure 3), expressions of ownership (Figure 4) and for material culture (Figure 5) (for the full pattern sheets and the codes that they refer to, see Reitsma 2015). The coding concepts in those pattern sheets can be compared by the size of the elements representing the codes. Each of the visits to the community was of a different length, due to the dynamics of the community, the designer's travel schedule, costs of travelling and weather conditions. Therefore, we divided the codes by the length of the stay in days. This gave the intensity of codes, as it showed the codes per day. We are aware that the longer the period, the more accurate this number is. Each pattern sheet played an important role in our understanding of important dynamics in providing a respectful design space. We structured these dynamics into a framework.

# 5. Outcomes

From the analysis, we learnt that there was a significant difference between the dynamics of the design process of the musical instrument and that of the lights. The first was community driven, the latter was driven by the designer.

Figure 2 shows the design participation and how it was divided. It can be deduced that there is a difference between the musical instrument activity and the light activity. Within the musical instrument design activity, the design participation codes show a mostly emancipatory relation between the community and the designer. The average of the design participation type shows that in each stage, the design activity of the musical instrument is community-driven. For the lights design activity, this is different. The design participation codes show a collaborative relation between the local designers and the external designer. Since collaborative design participation is designer-driven, we can conclude that the local designers did not control the process in this design activity.

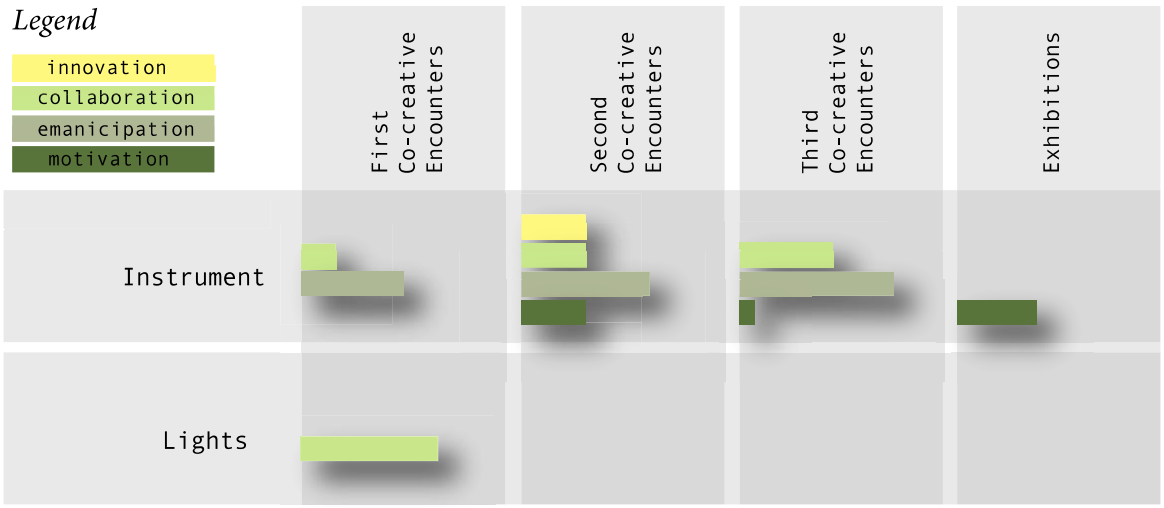


*Figure 2. The design participation throughout the design process, both for the musical instrument as for the lights.*

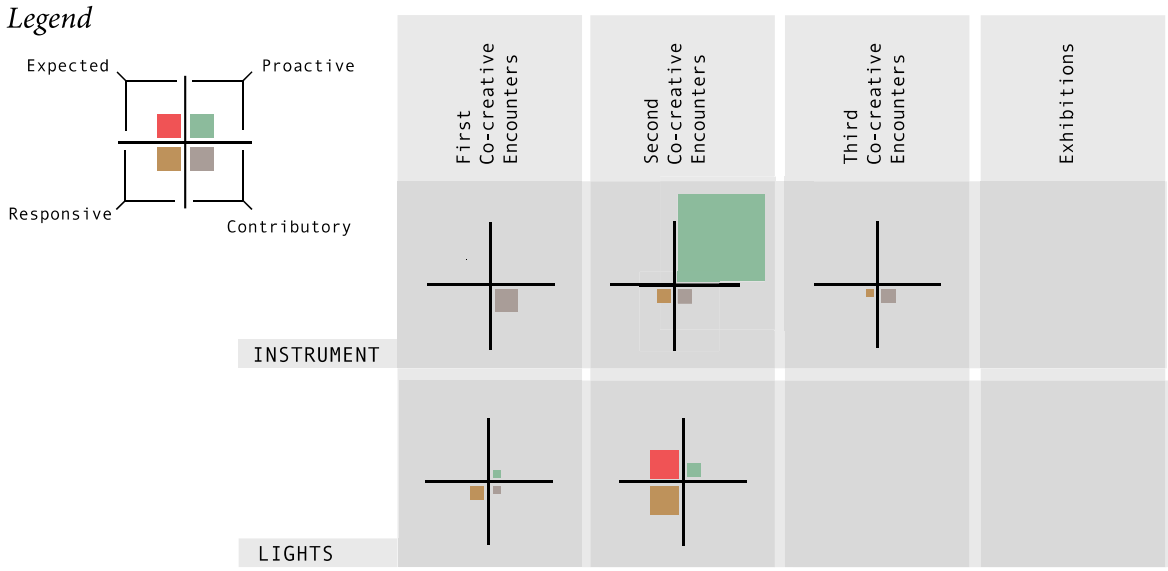


*Figure 3. The novel expressions throughout the design process, both for the musical instrument as for the lights.*

Figure 3 shows the coding of the novel expression (ownership of idea). Again, a difference between the two designs can be deduced. The musical instrument, mainly, has internally driven novel expressions (e.g. proactive and contributory novel expressions). In order for proactive novel expressions to arise, it seems to be important to provide space for the community to use their own material culture. Contributory novel expressions are important for respectful design because the community makes these on their own terms. Stimulating those expressions is of great importance since they can lead to a shift in the design process towards a respectful design space. The lights mainly have expected and responsive novel expressions, which are designer-driven.

From this, we conclude that there is a distinction between design activities that were in a respectful design space (e.g. the musical instrument), and those that failed to reach a respectful design space (e.g. the lights). But what were the dynamics of the one reaching a respectful design space and the other failing to do so?

## 5.1 Indigenous knowledge and the Community's material culture

As stated by Sheehan (2011), in a respectful space, indigenous knowledge is embedded. Hence, there should be a space for the indigenous knowledge of the community to function as input on different levels. It turned out that only in the musical instrument activity did the local designers make such expressions - maybe because here the external designer was more open to the expressions of the community in general, or because the technology probe provided more freedom. The lack of connection to the indigenous knowledge layer suggests that the other activities did not (yet) succeed in reaching a respectful design space. We recognised the importance of accepting the community's indigenous knowledge to serve as a (for the designer, often hidden) layer, which drove the entire respectful design space and all dynamics within it. The designer chose a humble response to these expressions. Whenever these expressions were made, she would show interest, but she would not push, since she wanted them to share only those things that they wanted to share. She accepted suggestions related to their knowledge without questioning them or asking for thorough explanations. This acceptance without questioning might have been important for the community to take ownership of the design since it created space for them to embrace their own ways of knowing as a driving force (see Figure 4, which for the musical instrument shows a high number of identity-oriented markers, suggesting perceived ownership). Thus, this knowledge became a layer under the entire project. Only occasionally, the community would express their connection to this layer.

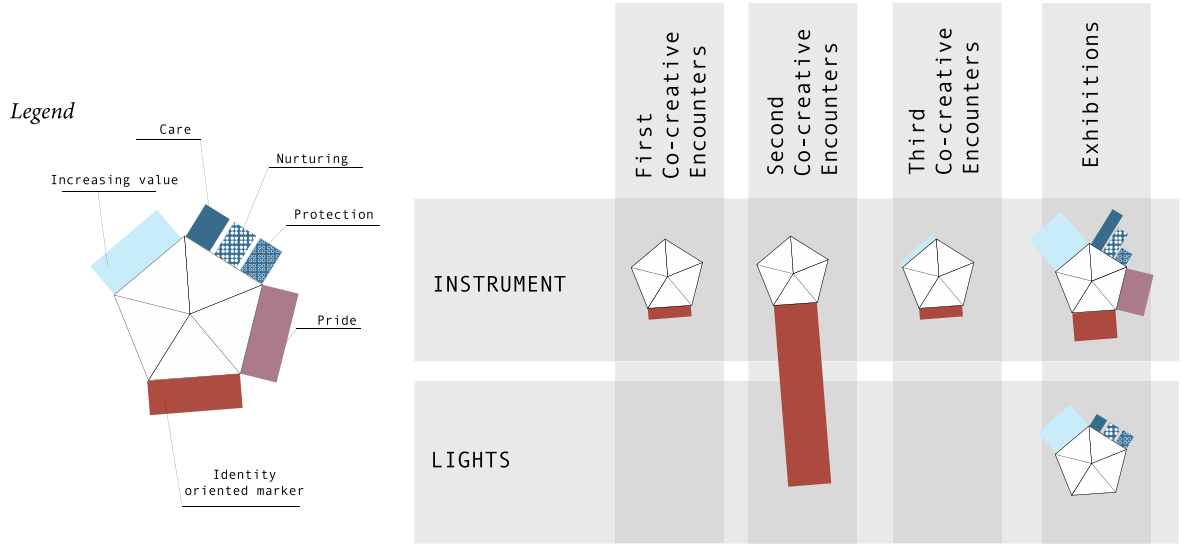


*Figure 4. Expressions of ownership throughout the design process, both for the musical instrument as for the lights.*

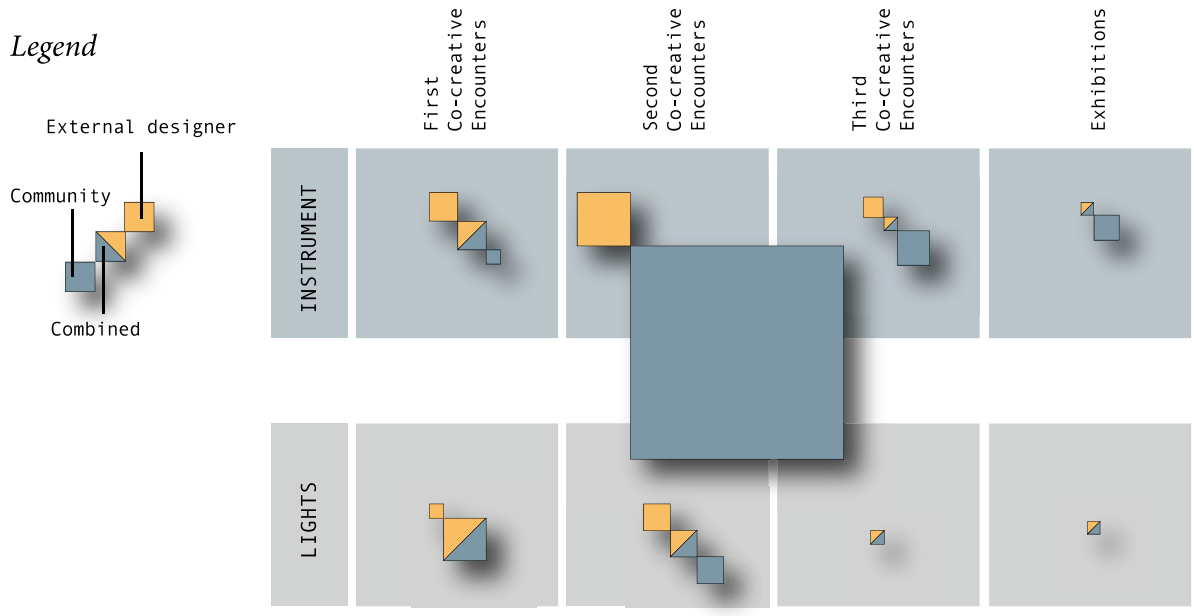


*Figure 5. Ownership of material culture throughout the design process, both for the musical instrument as for the lights.*

Thus, in the case of the musical instrument design activity, the designer went along with such suggestions and ideas. Because of this, the final design incorporated elements of Penan material culture and layers of indigenous knowledge, which enabled the local designers to take charge and to take ownership of this design (see Figure 5). This seems to be of great importance.

Secondly, the emphasis on the community's material cultural helped the external designer to disconnect from the technological design probes. By focusing on the community's material culture, the community becomes the expert. This can result in the designer stepping back from some of the design leadership aspects of the process, which ultimately can lead to a community-driven process.

Lastly, the explicit inclusion of the community's material culture helped the community to explore novel concepts. By positioning novel and foreign concepts into the community's material culture, those concepts can be discussed, and relevance and value can be explored. Contrast is a great teacher.

## 5.2 Third spaces

Reaching a respectful design space requires design conversation and engagement, but since the designer will not have a complete understanding, the community should be in charge of the design space in order to guide it towards their direct benefit. Such a division of roles, in which the community is in charge, will not appear instantly. It is a process that will take time, reflection and negotiation. This can be seen in that the community with each stage of the process, takes more control. There is an increase in, for example, community-driven design participation (emancipatory and motivational), expressions of ownership by the community and novel expressions that are community driven (proactive and contributory novel expressions). In the first stages of the process, the designer is strongly involved in the process and will co-explore with the community what the design space could look like. These stages are about negotiating a third space. They allow the community members to recognise the strength of their contribution and what they can bring by way of contextualisation, even as they allow the designer to show new possibilities to them. During the negotiation of such a third space, the external designer should try to encourage the other actors to develop their own capacities and spark their resourcefulness. By stimulating the community's own

resourcefulness, the external designer aims to progress to a transition in the process, resulting in the community taking control of the design space. When this happens, the community has the ability to embed decisions (and, thus, the concept) in the knowledge that lies at the core of the community's culture, thereby positioning it in a respectful design space.

# 6. Result

Figure 6 shows the respectful design framework based on these outcomes. This framework adds to the theoretical approach of both Sheehan and Tunstall as it introduces the importance of breaking the dialogical space that they proposed into two separate spaces: the respectful design space, in which the indigenous knowledge of the community is interwoven in the design space (as the ultimate goal to reach) and the third space (before reaching a respectful design space in order to spark the resourcefulness of the community so that they can steer the project into a respectful design space).

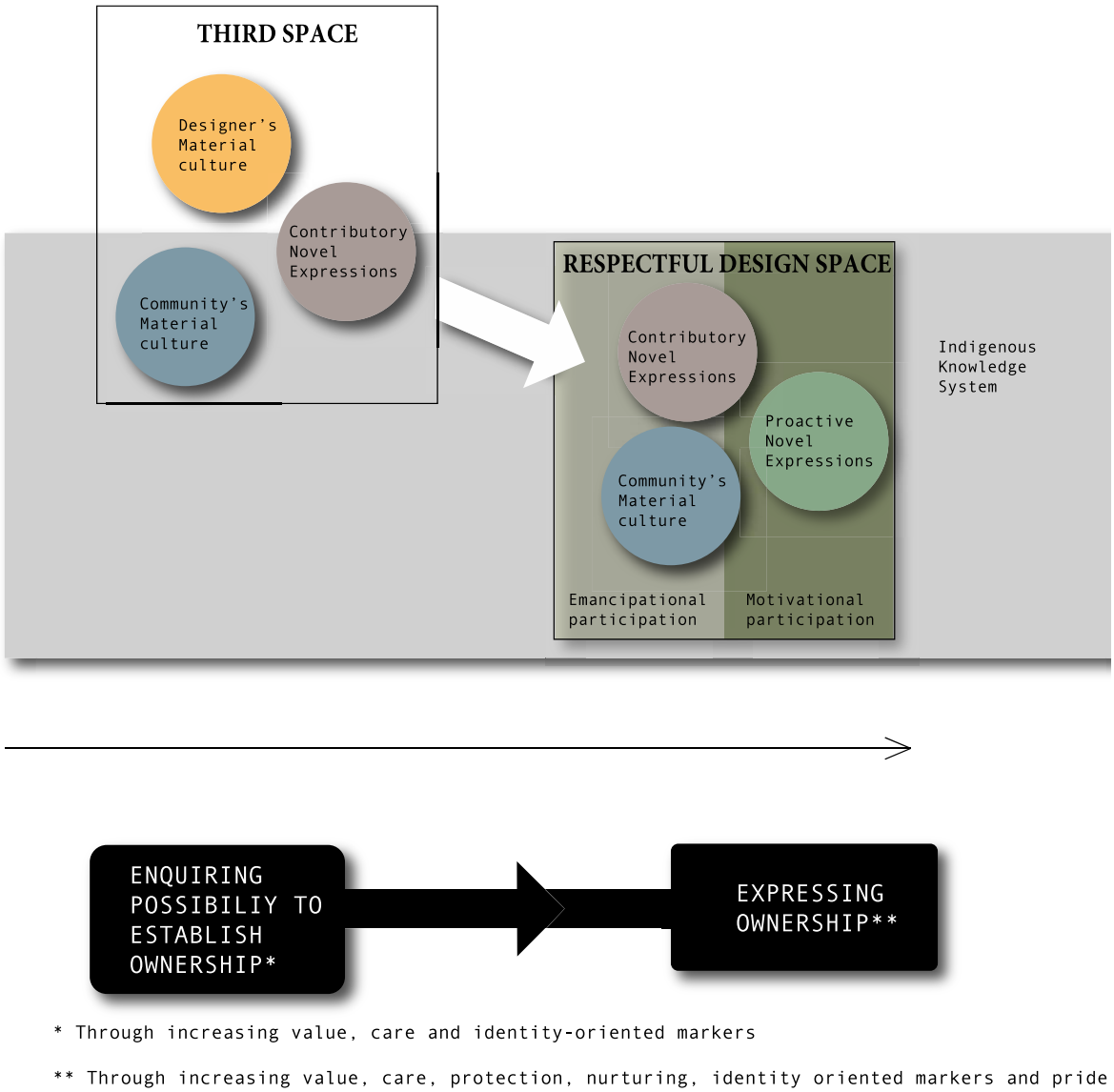


*Figure 6. The respectful design framework.*

In practical terms, the designer can stimulate such a third space by: 1) introducing design tools and methods as discussion and conversation starters, 2) supporting contributions and ideas of the

community members in order to spark their resourcefulness (even if they are beyond understanding since they are embedded in Indigenous knowledge), 3) being open for the community to bring in their material culture and 4) evaluating his/her personal connection to the design process.

# 7. Discussion & Conclusion

As a concluding note, we point out that providing a respectful design space does not mean we must obstruct other dynamics. We would even say that the opposite is true; 'responsive' and 'expected' types of novel expression might trigger other intentions, and a variety of types of design participation are needed to make something a reality. However, at any time in the process, it is only by working towards, first, a third space, and then a respectful design space that we can hope to achieve a balance of dynamics towards appropriate respect for all partners. In other words, the respectful design space framework should be understood as a process.

## 7.1 Benefit for whom

We, furthermore, have to consider whether coming into a community with the agenda of completing research can ever fully be an exchange. There is always a foundational act of initiation, from a designer, a government agency or a community, that sets the project in motion (Light *et al.*, 2013). When the ambition is research as well as designing, there is always the question of who benefits from the additional knowledge that comes from the engagement. Without her visit to Long Lamai, the community would not have its cultural artefacts and a window on very contemporary technology. Meanwhile, the authors would not be able to write about a respectful design space. But, until the community met the main author, they did not seek a designer or a Pagang enabled by the Internet, and, even now, they may not have much use for a paper on respectful design.

## 7.2 Ownership

We found that ownership is strongly embedded in a respectful design space. It serves as the marker to evaluate the potential for starting a respectful design space and as a marker to evaluate the success of the respectful design space. With other dynamics, such as ownership of process (design participation), novel expressions and type of material culture, ownership embeds in the successful concepts that appear in a respectful design space (motivational design participation, proactive novel expressions and the use of the community's own material culture). While it is the norm to evaluate ownership in other fields such as development studies, this topic appears to be neglected in co-creative design, despite the multiple actors involved and the societal change that projects might cause. In the respectful design space model, ownership is at the centre of the evaluation in order to understand the success of the co-creative design participation.

## 7.3 Indigenous Knowledge

Sheehan (2011) describes respectful design as design informed by indigenous knowledge. A respectful design space is thus a design space informed by indigenous knowledge. Indigenous knowledge involves layered understandings that contain streams of knowledge that interrelate nature and culture. For an outsider, these streams of knowledge are complex to comprehend, especially because of their spiritual component. Our experiences within the project confirm this. It taught the external designer to take a humble stance, because her understanding of the indigenous knowledge system will always be incomplete.

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**Acknowledgements:** We extend our gratitude to the Penan community of Long Lamai, Garen Jengan, Wilson Bian Bilare', the elders and youth group of Long Lamai, the ISITI-CoERI institute (of UNIMAS) and Bastiaan Ekeler.