

Eight practice issues in design knowledge transfer: a case study

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Driving renewal in the public and private sector through design at a local scale requires that the local agents go through a revolution of themselves. Supporting local entities in changing by design with and for people is what the Design Research Lab (DRLab) at the University of Trento (Italy) is practicing by facilitating the transferring and application of design knowledge to the educational, production, and public policy systems in Trentino. This paper refers to two experimental design experiences (DXs) that were performed with the Design Studio format (one of the DRLab formats) in collaboration with local stakeholders with the aim to encourage the usage of service design as a human-centred approach for designing. The DXs were analysed as a case study through an analysis of the gaps according to the identification of twenty-two items. Data gathered with the involvement of the DXs participants in focus groups, semi-structured interviews and questionnaires, were matched with data emerged in the analysis of the DX with the Logical Framework tool. Fifty-three gaps were identified and they were described in eight crucial areas for the efficiency of the design knowledge transfer through DXs performed with formats such as the Design Studio. Also, the process allowed to identify five criteria for the development of this kind of DXs. Finally, this paper allows to reflect on how local actors are perceiving 'design', how they can be involved in future experiences and how these aspects can influence a local design research development in the next future.

Keywords: *Design Knowledge Transfer; Service Design; Complexity*

1 Introduction

The attention on design as a strategic resource for supporting the transition from the economy of the product to the economy of services and knowledge is growing in public and private entities. Partially, this follows what the European Commission has been encouraged through the Action Plan for Design-Driven Innovation (European Commission, 2013) where "the Commission seeks to actively promote design's relevance and value as an enabler of innovation amongst Europe's enterprises, public sector organisations, policy-makers" (Evans & Chisholm, 2016). Despite these recommendations are not so recent, the implementation of these kind of plans for supporting strategic areas such as "the adoption of design to drive renewal in the public sector" (European Commission, 2013) at a local scale, is still not considered as an essential systemic change in every geographical and cultural context. This requires that entities and organisations, and thus people, are ready to accept the change, embracing the new and in some cases make a revolution of themselves. This change is

even more complex in contexts where ‘design’ is not systematically adopted. Universities should play the most impactful role in preparing the background and supporting local entities in changing by design with and for people.

The Design Research Lab (DRLab) at the Humanities Department of the University of Trento (Italy) is practicing this vision for the first time in the region in a combined initiative with Confindustria Trento, the Bruno Kessler Foundation (FBK), and the Pavoniano Artigianelli Institute. DRLab is a research centre funded by the autonomous Province of Trento and since 2017 has the mission in facilitating the transferring and application of design knowledge to the educational, production, and public policy systems in Trentino. Following a Research Through Design (RTD) approach (Frayling, 1993; Findeli, Brouillet, Martin, Moineau, & Tarrago, 2008; Godin & Zahedi, 2014; Jonas, 2007; Manzini, 2015; Reeker, van Langen, & Brazier, 2016; Zimmerman, Stolterman, & Forlizzi, 2010) in the field of study of the design research (Archer, 1981; Findeli et al., 2008; Findeli, 2010; Jonas, 2014; Manzini, 2015), DRLab is adopting service design as a strategic stimulant to be encouraged for innovation in public and private entities and associations of the Province.

1.1 The DRLab Research Framework and the action model

This paper refers to the first year of the DRLab activities between the end of 2017 and the 2018 when DRLab was engaged in the first of three research phases (figure 1) i.e. (i) setting-up; (ii) experimenting; (iii) modelling. The ‘setting-up’ phase has the objective in encouraging the usage of service design as a human-centred approach for designing in contexts where it is not systematically adopted.

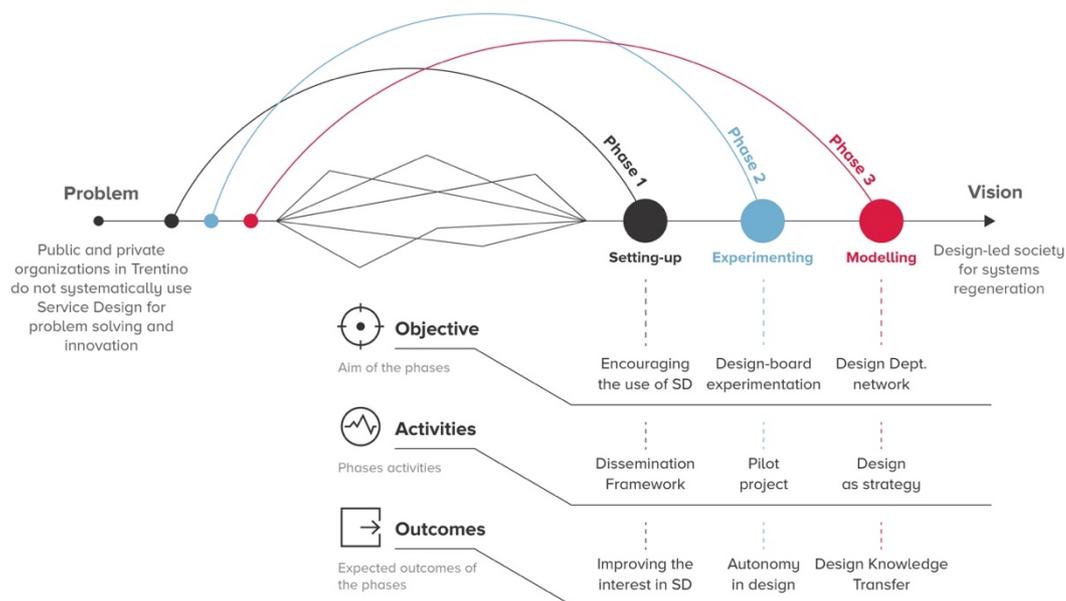


Figure 1. A visual abstract of the DRLab Research Framework.

1.1.1 The action model

To reach the objectives of the first research phase, DRLab followed an action-based model developed according the following phases (figure 2):

- the Engaging phase for creating design partnerships with local stakeholders;
- the Analysing phase for optimizing design praxis and theoretical workshops and seminars about design and related field;

- the Applying phase for applying a series of theoretical seminars, workshops and design experiences (DXs) with local agents and design partners;
- the Evaluating phase for analysing and reflecting about the data gathered in-field activities in the previous phases.

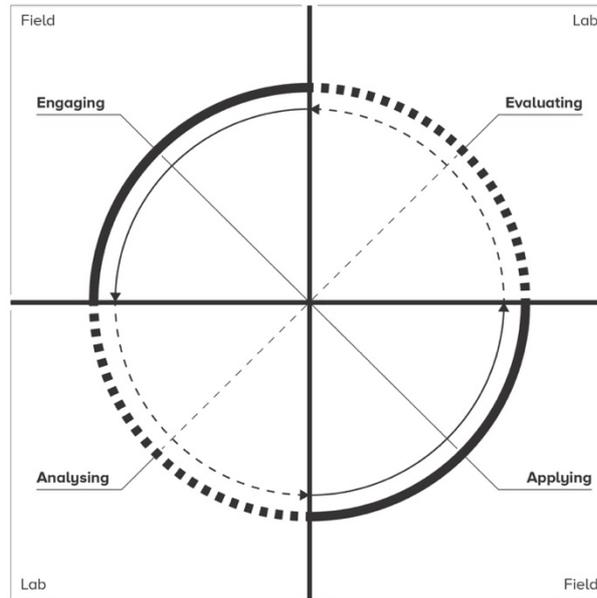


Figure 2. The DRLab action model.

This paper will focus on the activities developed as DXs that are intensive action-led experiences in collaborative design with local stakeholders not trained in design. Five partners among public and private entities in the Province were engaged in different kind of DXs provided for free (see figure 3 for an overview of the activities data).

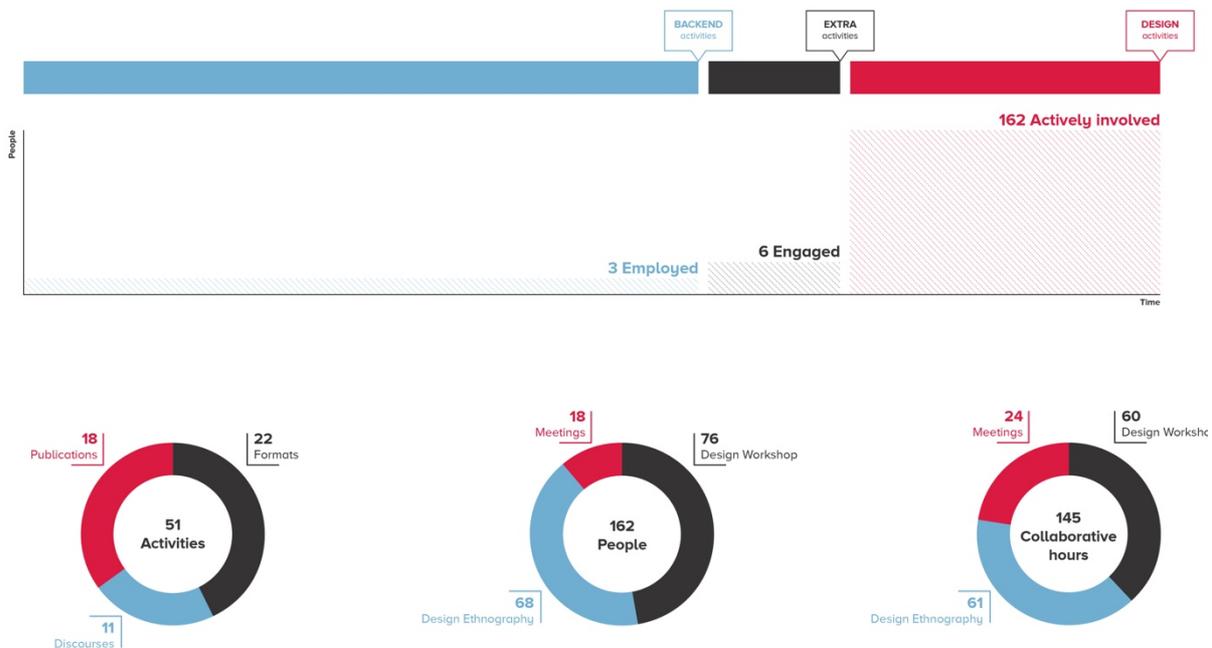


Figure 3. DRLab activities overview.

1.2 The early results

From the activities developed on field and following an inductive reasoning process, a Dissemination Framework was identified as a set of action-led research activities for a setting-up phase (see figure 4 about the outputs) in a wider Design Knowledge Transfer process. The three main cores of the DRLab Dissemination Framework are (i) discourses; (ii) publications; (iii) formats.

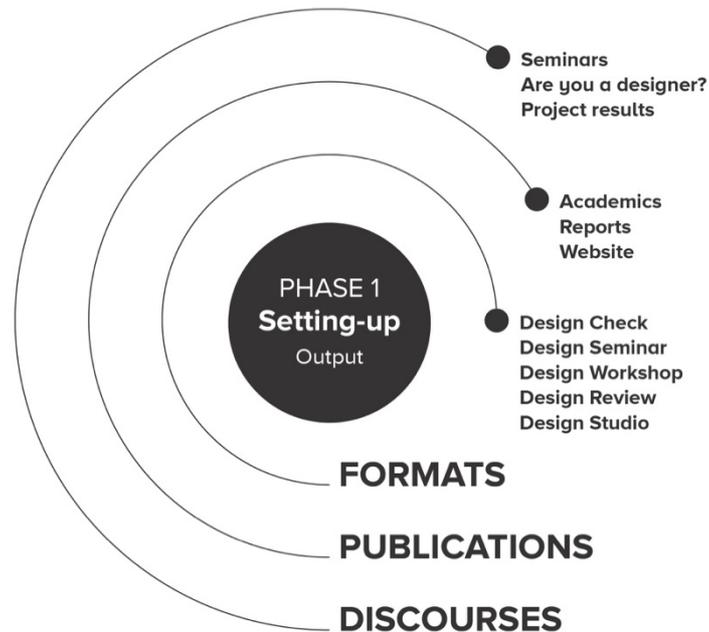


Figure 4. The main output of the 'Setting-up' research phase.

'Discourses' are activities such as seminars, workshops (named 'Are you a designer?'), and project presentations that have the aim of disseminating the theoretical and practical aspects of design in order to create and maintain an open 'local design discourse'.

'Publications' are all the media (i.e. website contents, technical reports, and academic publications) that have the aim of communicating the design contents and results, theoretical aspects of all the different subjects at different levels of expertise, and research works.

'Formats' are participative design formats that have the aim of engaging local agents to apply basic human-centred design knowledge with learning-by-doing approaches. Five design formats were identified and thirty-two design tools were selected and optimised to be used in co-design activities with people not trained in design. Every format differs for the objective of the DX, the participants profile and number, the minimum of collaborative hours and the maximum number of design tools to be used in the whole DX. According to these indicators it is possible to identify five design formats (figure 5):

- Design Check;
- Design Seminar;
- Design Workshop;
- Design Review;
- Design Studio.

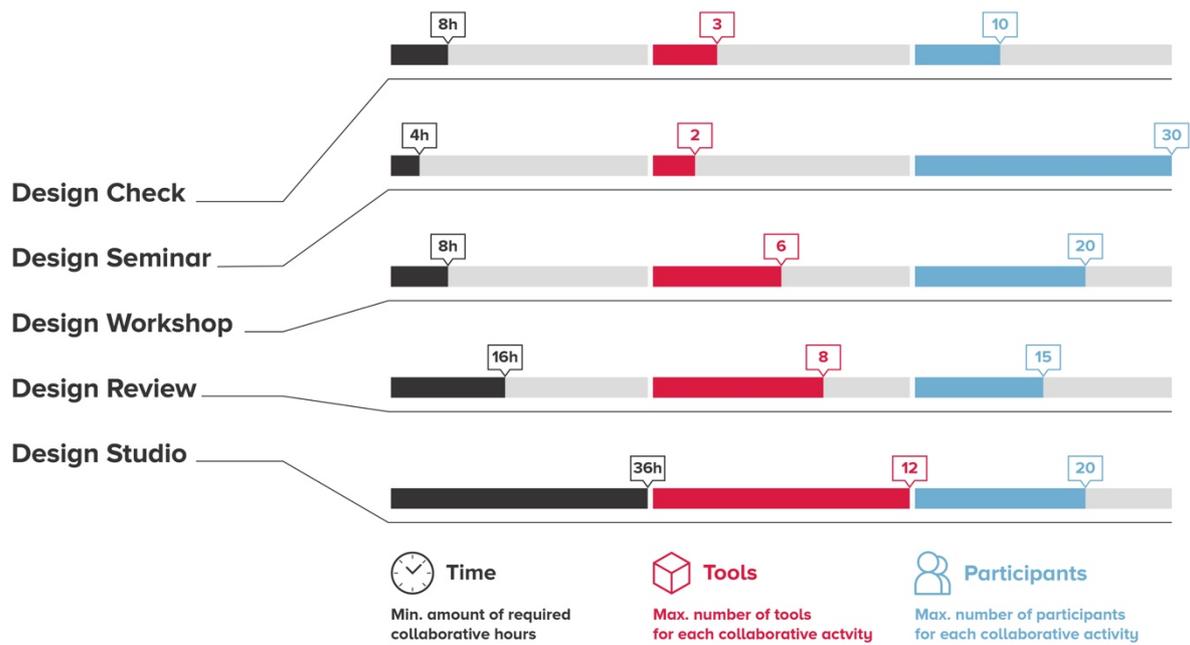


Figure 5. Design Formats of the DRLab Dissemination Framework.

1.3 The DXs with the Design Studio format

This paper describes a part of the evaluation phase related to two DXs developed with the Design Studio format that was applied to two different local entities. The first (DX1) was a public entity in the educational system; a technical/technological high school of the Province. The second (DX2) is a trade association (production system) that groups around one hundreds of micro, small and medium private enterprises engaged in the food system of the Province. Both of the DXs were developed for around three months with activities such as design setting and briefing (pre-meetings), design ethnography, and co-design activities.

The Design Studio is a format developed in a minimum of thirty-six collaborative hours with a maximum of twelve design tools used with twenty participants. The objective of this design format is exploring the design contexts with real data and a setting simulation in order to understand real problems and opportunities as well as stakeholder needs. As defined by this format, a Collaborative Project Management Team (CPMT) and a Co-design Team among the participants' groups were formed. The CPMT is a group between four and eight people among the design partners. They have the aim to co-design with DRLab team the early phases of the DXs before the starting of the main co-design activities. They are mainly involved in what, according to the Design Studio format, are named "pre-meetings". Also, the Co-design Team is a group formed from a minimum of six to a maximum of twenty people for each collaborative activity. They assume the role of co-designers in the whole DX. Finally, a group of participants, experts and other kind of users were involved in design ethnography activities for both the DXs.

This paper focuses on the analysis of the gaps in the development of the DXs through the Design Studio format. Also, this research work allowed the identification of a set of critical areas and criteria for future experimentations.

2 Methodology

The application of the Design Studio format in two different contexts was analysed as a case study through an analysis of the discrepancies between what was planned as design format and what was really experienced in-field activities.

Studies about ‘service quality’ provide models (Brown & Swartz, 1989; Hakatie & Rynänen; 2007; Parasuraman, Zeithaml, & Berry, 1985; Parasuraman, Zeithaml, & Berry, 1988; Zeithaml, Berry, & Parasuraman, 1988) for developing gap analysis. However, the Design Studio format is the result of combined needs such as (i) producing tangible results in a short range of time; (ii) respecting the lack of time of all the involved agents; (iii) affecting as much entities as possible with the DXs in a short range of time and with limited resources (i.e. three employees with different backgrounds such as philosophy, design, design research and a very limited budget for one year). Therefore, this format has still an experimental status and it is still not possible to consider the two DXs as an implementation of a set of services. For this, applying the service quality gaps model was evaluated as a premature step.

Therefore, a first analysis was provided through the Logical Framework (LF) (European Commission, 2004; Sartorius, 1991; Tache, 2012; United States Agency for International Development, 2012) of the Design Studio format by reading the DXs as they were experienced with the LF items. This highlighted a series of incongruences and the data were embedded in an analysis of the gaps (figure 6) developed as a matrix that matched ‘planned’ and ‘experienced’ status. The matrix was completed with (i) data emerged through the analysis of the DXs with the LF; (ii) data gathered during the development of the DXs; (iii) data gathered with the participants after the DXs through focus groups or semi-structured interviews, and anonymous questionnaires.

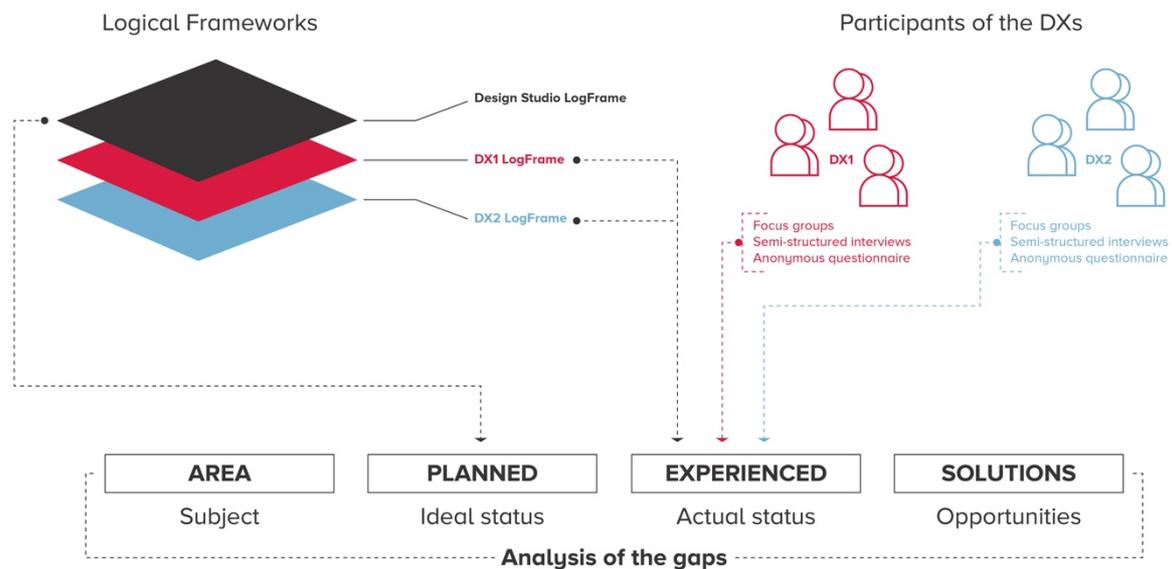


Figure 6. The analysis of the gaps through the data gathered by the DXs.

The first column of the matrix describes the main areas to be analysed; the second and the third column reports specific elements of the area to be analysed as they were ‘planned’ (ideal status) and ‘experienced’ (actual status) in the real world. Differences between

'planned' and 'experienced' status identify the gaps for each subject. In the last column were identified solutions to reduce the gaps.

A total of twenty-two subjects were identified to be analysed according to three macro-areas (figure 7). For gaps where a direct solution resulted unsatisfying, alternative techniques such as cause and effect diagrams, the Problem Tree (Department for International Development, 2003; European Commission, 2004; Snowdon, Schultz, & Swinburn, 2008), and the Five Whys (Kohfeldt & Langhout, 2012; Ohno, 1978) were used for a better understanding of the causes of the gaps.

Finally, all the gaps were described according to a set of "crucial areas" as it will describe in the results paragraph of this paper.

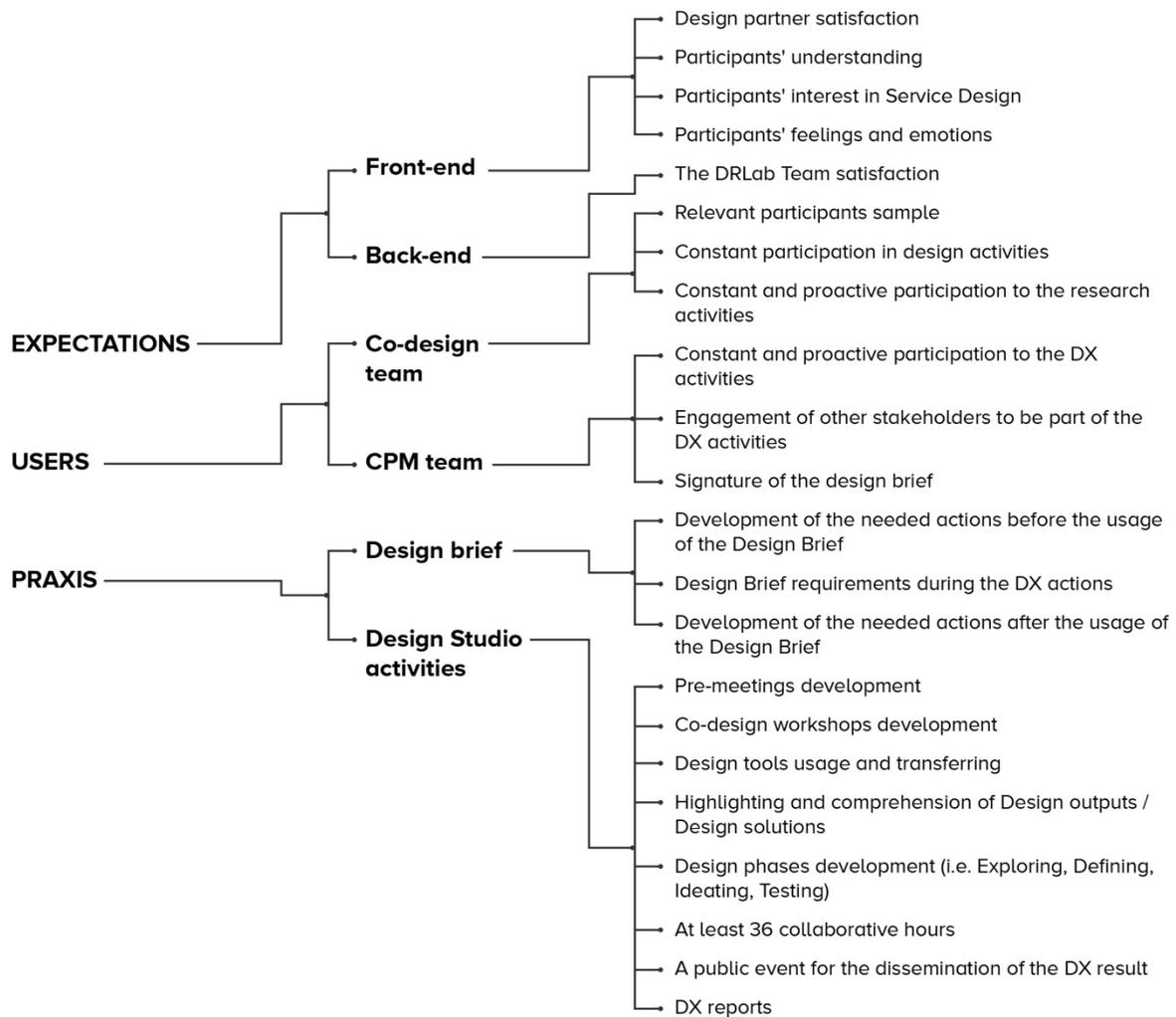


Figure 7. Subjects map of the analysis of the gaps.

3 Results

Fifty-three gaps were identified and the analysis allowed to underline the presence of eight critical areas that result as crucial for the efficiency of the DX through the Design Studio format. Finally, five criteria were identified for implementing a more effective DX and having more chances to reach the aim in disseminating design knowledge at a local scale.

3.1 Crucial areas

The following paragraphs describe eight critical areas and the related opportunities according to the identified gaps.

3.1.1 Participants sample

'Quantity', 'profile' and 'constancy' of the participants are the three indicators for a relevant DX for disseminating the design knowledge through a learning-by-doing approach. Reaching a relevant participants number does mean reaching a relevant participants profiles representation among the stakeholders. At the same time, if the participation of the involved actors is not constant in doing all the planned collaborative activities, the DX can be negatively affected.

The Co-design Team is generally the group more affected by this kind of discrepancies. Indeed, an average of twenty participants in this kind of group for each DX was expected but less than two thirds of them for each DX resulted constant in participating to all the activities.

About the profiles, in the DX1 three on six profiles of actors were not or not constantly represented. In the DX2, one of the four profiles among the actors group was not represented. Motivations and expectations of the participants are the two most influential identified causes. These can have an interdependence with the motivation and the expectations of the representatives of the design partners that were the responsible for the involvement of the participants after knowing the Design Studio requirements.

Therefore, more time is needed to collaborate in advance with the design partners for (i) guiding the involvement of the participants step by step; (ii) providing more touchpoints for respecting the requirements of the whole DX. These actions should be developed in at least one third of the time of the whole DX and mainly before the starting of the experience. This requires a time reframing of the Design Studio setting.

About 'motivation', if every DX could be recognised as a socially relevant experience for the quality of the daily design activities of the participants, it should be in the interest of the local institutions (e.g. the local government) to provide recognitions for those that participate to a DX.

3.1.2 Research data

The observation of all the interactions between people and the DX activities, as well as the feedback of the participants provided during and after the design activities through surveys, interviews, focus groups are the crucial data that it is possible to easily gather through a DX. However, some participants demonstrate a very low level of interest in giving feedback through these activities. This creates some gaps in gathering data. Some participants declared to be busy with their job or generically without 'extra time' for answering and giving feedback.

This is proved by some indicators such as:

- the number of participants equal to the 70% for the DX1 and the 58% for the DX2, that answered to the questionnaire after every co-design workshop despite the response rate was expected between the 80% and 90%;
- the number of the actors among the Co-design Teams that participated to the focus groups or the semi-structured interviews; around the 95% of the participation was

expected while only the 66% in the DX1 and the 63% in the DX2 participated in to this kind of activities.

Accordingly, integrating more research techniques as much as possible inside the DX process, in loco after every activity, as an essential DX touchpoint, can represent a strategy to cover these gaps. Also, increasing the involvement of the actors in the research matters can be a strategy for enhancing their awareness and increasing the participation.

3.1.3 DX outputs and design results.

Finished design tools, activity reports, and other kind of design outputs of the DX were not considered by the participants as it was expected. Short tutorials and documents for the comprehension of the design results were requested from the participants. In addition, almost all the participants found it difficult to understand the whole logic of the design process and the specific outputs of the DX such as a finished design tool that suggests design solutions or opportunities.

The followings are the identified measures for reducing these gaps:

- providing short resumes about theoretical aspects of design to be consulted by the participants before, during and after the DX in a step by step process;
- providing summaries (schemes and graphs) about the adopted procedures and the results of the DX emphasising basics aspects such as “how getting insights from a finished design tool”;
- encouraging the self-training and providing an extra support for the usage in autonomy.

3.1.4 Contents for all

The participants of the DXs were people not trained in design and with very different backgrounds, educations, skills and attitudes. Despite all the contents of the format were designed and optimised in an inclusive way, a few gaps emerged in understanding them with a systemic and holistic way. The three following aspects underline the main gaps about these topics.

First, the design process was simplified and a comprehension of the 75% of the whole logic was expected in the participants. However, the following aspects generate gaps:

- participants understood the sequence of the phases but the whole comprehension has been made complicated by a few basics aspects such as the advanced terminology in English language;
- the efficacy of the single design phase resulted not easy to understand;
- misunderstanding about the logic affected the application in autonomy.

Second, during the development of the DX, data for the design process gathered during the co-design workshops and the design ethnographies were processed in laboratory in order to save time and simplify the process to the participants. However, this simplification did not allow the participants to understand how data gathered in co-design or user research activities can be autonomously processed.

Third, all the design tools for the DXs were optimized for people not trained in design. A few tools were undervalued; others were well used but not fully understood to be used in autonomy. Finally, despite the design tools were well performed by the participants, the

quantity of the used tools (three tools for each co-design session) resulted a bit stressful for the participants learning process.

Premise that all the theoretical and practical contents of the DX should be continuously redesigned with an inclusive approach and an iterative process, to cover these gaps a particular attention is needed for the following points.

The main strategy is to focus on:

- people not trained in design;
- people that can generally be considered the opposite of those have a proper design attitude or 'design comfort';
- people that may have a very difficult access to the contents of the DX;
- people that are particularly critical with the design practices.

About the design process, it should be always co-designed with the design partners and participants of the DX. If not possible, it should follow simple and clear rules reaching a balance between a simplified process (avoiding to underpower it) and an advanced detailed process; new ideas are needed on how transferring the design process as a holistic body of praxis. In addition, new ideas, tools and praxis are needed for developing collaborative sessions with the participants for data analysis and getting insights from the data gathered during the co-design and user research activities.

About the design tools, it is required to (i) select the right number of tools for each activity avoiding an overload for the participants learning experience; (ii) maintain a dynamic and very easy logic between the design tools and the design process; (iii) support with theoretical contents the learning process about the tools reinforcing proper aspects of the design attitude such as how gathering insights through the tool and gaining design results.

3.1.5 Balancing the learning-by-doing approach

Some gaps are related to the participants that needed more theoretical training and support. Indeed, most of the activities were provided with light theoretical introductions with the aim to compensate the short time, and the desire of the participants to identify practical answers to their problems. This approach only partially did work because at the end of the DXs the participants manifested the needs in understanding more theoretical aspects for closing the learning process.

The learning-by-doing remains a useful approach for introducing beginners to design-led approaches. If adopted, at least the 25% of the time should be spent to introduce theoretical aspects about design (e.g. the approach, the design process, the design tools) highlighting apparently easy issues for experts that are for instance how, when, and why using a specific design tool.

Without taking anything for granted, a particular attention should be reserved to:

- significant case studies that explain the relevance of the process and the tools;
- the practical implications of the DX applied in the real world;
- examples of applications on the same system of the DX.

3.1.6 Collaborative activities planning

Some gaps in the previous paragraphs depend on how the main collaborative activities of a DX (i.e. pre-meetings, co-design workshops, design ethnography, final event) are organised in terms of specific objectives and timing.

The pre-meetings were planned as activities before the kick-off of the design activities for (i) introducing the DX to the design partners and to the CPMT group, (ii) filling the design brief and (iii) co-planning the subsequent activities with the design partners. The highlighted gaps suggest that too much activities are required in the pre-meetings.

The co-design workshops were oriented to identify specific design results. The highlighted gaps suggest that a few theoretical aspects were missed for the whole understanding of the workshop as a training collaborative activity in a design process.

The design ethnography activities were conducted as an in-field inquiry by the DRLab team due to the less time, the limited resources and the scarce availability of the participants. The gathered data were analysed in laboratory. Process and results were reported to the participants as data for designing. The highlighted gaps suggest that this praxis is not enough for transferring the basic elements of the design ethnography in order to encourage human-centred approaches to the participants.

The final event is a fundamental activity to be developed for disseminating the DX results to the local audience and it was ideated as a collaborative activity to promote service design and its local applications. The analysis of the gaps highlighted that the final events were transformed as a not fully collaborative activities oriented to promote the design partners rather than the value and the results of the DXs.

Therefore, pre-meetings should be more oriented to only fill the design brief with the CPMT and a few activities for orienting the design partners are required before this step.

The co-design workshops should be redesigned as following:

- 25% of time to be spent for theoretical aspects;
- 50% of time for co-designing with the design tools;
- 25% of time for analysing the collaborative design activity and reading data gathered through the used design tools as well as to frame the value of the activity in the whole design process.

Also, design ethnography should be treated as a full collaborative activity. Therefore, the participants should have experience of this kind of in-field exploration as 'researchers' supported with theoretical and practical insights.

Finally, the events at the end of the DXs should be co-designed during the DX focusing on the goals that are the promotion of the adopted design disciplines and the presentation of the design results to the citizens. Any form of self-promotion during the event should be avoided as design partners can easily fall in this kind of gap as shown by the analysis.

3.1.7 Expectations

A DX has the objective in transferring basic design knowledge through a collaborative approach and the identification of design concepts are the best results that is possible to be expected from a design point of view. However, the design partners expected to find developable or partially developed design solutions for their problems with minimal

participation. This highlighted gaps in the engagement phase with the design partner's representatives. But most of all, this shows that the design partners understood with many difficulties that the DX is based on a participative model rather than on a traditional 'consulting model' where there is a client that requires a design solution from a professional.

At the same time DRLab expected (i) to increase the interest in service design to the DXs participants and (ii) allowing them to use design tools autonomously. However, the interest of the participants in service design is just at the beginning and the autonomy in using the design tools is still under the expected level.

These gaps underline needs in providing specific training actions addressed to the design partner's representatives before the starting of the core design activities of a DX. The actors learning process start from the understanding level of the design partner's representatives. Requirements, DX criteria (focusing on collaborative models) as well as theoretical and practical aspects should be the focus of the training of the design partner's representatives.

3.1.8 Time scheduling

The previous gaps had underline needs in redesigning the process of the DX with a different distribution of the time and providing changes such as:

1. Implementing additional tutoring phases for the design partner's representatives, the CPMT group and the co-design team before the pre-meetings;
2. Starting the engagement phases of the participants during the tutoring phases;
3. Developing pre-meetings and co-design workshops in a less range of time;
4. Starting the design ethnography activities before the pre-meetings;
5. Providing an analytical phase at the end of the DX for discussing about the design results and DX outputs.

Giving flexibility to the design of the DX process in order to be co-designed with the beneficiaries is the best strategy for ensuring the respect of the DX criteria and reducing the gaps shown in this paper. However, in figure 8 a proposal of the DX process redesign is reported with the aim to fix a first structured reflection on the DX process.

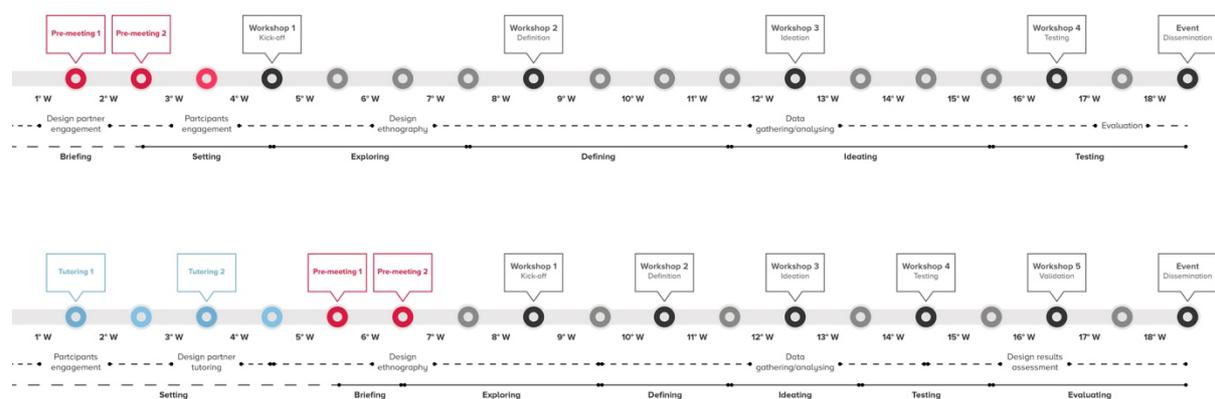


Figure 8. Redesigning of the Design Studio format experience flow. Above, the format as it was planned; below, how it was redesigned after the analysis of the gaps.

3.2 DX Criteria

The empirical observation of the DXs and the analysis of the gaps allowed to identify criteria for the development of DXs through the Design Studio format in future experimentations and with the aim to transfer design knowledge in a practice way. Therefore, a DX provided through a Design Studio format implicates the following criteria.

3.2.1 It adopts human-centred approaches through inclusive principles

Every action, output and content planned and performed by a DX should be designed and developed with an inclusive approach favouring all the possible situations for understanding the context and iterating. All the DX components must be accessible for the wider number of potential local beneficiaries; especially for people not trained in design.

3.2.2 It is a simulation of a design process with real data gathered in-field

A DX is only a part of a design knowledge transfer process that is a complex, long-term, and expensive process. It is possible to identify hypothesis, concepts or elements to be transferred in a logical framework for a longer and more complex action plan but it is not plausible to solve problems and implementing solutions.

3.2.3 It is a training experience

A DX is a way for disseminating the design culture through collaborative approaches with people not trained in design. It is the chance to understand in a context how people design, supporting their way to design and exposing alternative approaches for developing their own design attitudes.

3.2.4 Design research is the theoretical reference

A DX is designed and developed with the objectives of (i) transferring design knowledge and (ii) creating the occasion for doing in-field studies and reflecting on how these actions produce a contribution on design knowledge, design practice and design education (Findeli et al., 2008).

3.2.5 It is based on learning-by-doing and collaborative models

Co-design is the main approach for conducting design activities with the participants. A DX is not based on a consulting or a top-down model, therefore all the main decisions are the results of a collaborative process with the participants. Activities provided in laboratory as back-end activities have the only aim to optimise complex contents and results for increasing the learning process about design knowledge.

4 Conclusions

The case study presented in this paper allows to identify three levels of reflections related on how people perceived design and the DX, how they can be involved in future experiences and how these aspects should influence design research experiences in the next future.

The first is related to the difficulties that DRLab met in promoting service design engaging local design partners for doing DXs as experiences provided for free. Every DX does not make sense without an intense and proactive participation of different kind of people that with their differences represent the main resource of the whole experience. However, promoting service design in entities where it is not systematically adopted sometimes entails to resort to forms of recompenses (e.g. highlighting the possible political connections; advancing unsustainable design solutions; promoting marketing results). But this approach completely transcends from the sense of the DX as a way to transfer knowledge. This

underlines that it is still difficult to prove the efficacy of the adopted design discipline in neophyte contexts and that 'design' for the local public opinion is still linked to the aesthetic aspects of the artefacts. In other words, the experiences described in this paper highlight the requirement for design research to assume a political role in the society and giving answers on how influencing the daily cultural dimension of a context.

The second is related on how design is perceived at a local level by entities that do not systematically adopt service design. The analysis of the gaps has shown some needed steps before applying a DX that should focus on promoting and transferring the collaborative design values and principles. This implicates the identification of supportive formats or the integration of this kind of activities to formats such as the Design Studio. This main objective is to support a local cultural shifting from perceiving design as an action provided by professionals (consulting model) in favour to participative models.

The third reflection is related to the praxis that more concern the DRLab as a strategic entity for developing a local design research. From a practical point of view DRLab has to activate iterative processes for optimizing its design formats in terms of timing, processes and logic also adopting a more experimental role rather than an applicative role. Practically, needed next steps are the validation of the DXs among the identified design formats including *placebo controls* (Cash & Culley, 2015) as short and mid-term steps to be implemented in the research framework.

Also, according to the DRLab Dissemination Framework, the identified design formats should be experimented with more DX and design partners with the aim to improve the dissemination phase in terms of time and 'local knowledge'. Improving these kind of actions with more test formats and experimental DXs is a way for improving a local design discourse that actually is a prerogative of only a few advanced entities in the territory without a diffuse impact.

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