Future Divercities

Prospective Impact Assessment Process (PIAP) in Future Divercities

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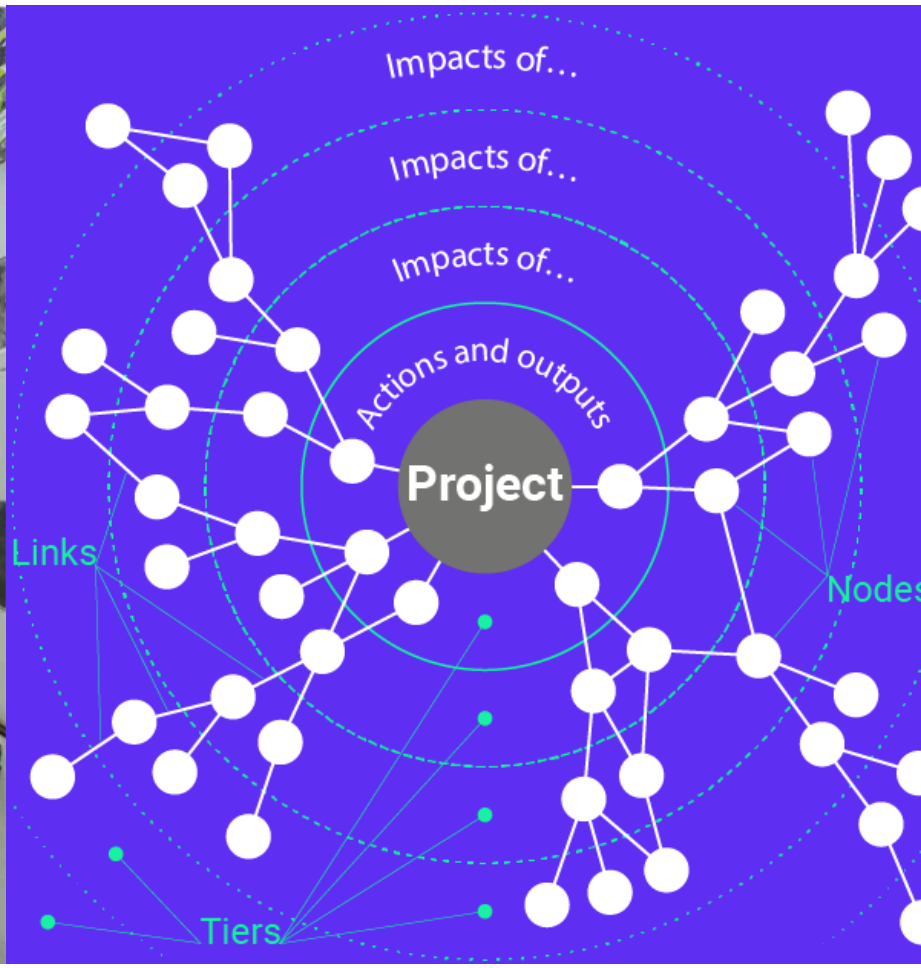

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Prospective Impact Assessment Process (PIAP) in Future Divercities Project (FDC)

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Abstract

This paper presents the prospective impact assessment process that we have developed. Our work stems from the need to perceive the impact of planned projects as early as possible and to review the direction of projects as they progress. Through our work, we see parallels between Transition Design and Transformation Pedagogy, the meaning of which we also seek to open in this context.

The development work is part of the international Future DiverCities project. In the paper, we outline our development work not only on the project but also on Design Thinking and the Frame Innovation framework on which our process is based. This framework is, in principle, a design process developed for complex challenges, and we also present how we have changed it to better fit our purpose. The design perspective is related to future-led work and helps to outline the activities and outputs of projects. The work has been supplemented with the Futures Wheel method to further assess the impact of the project qualitatively.

We conclude the paper with the notion that while PIAP has received an interested welcome within the Future DiverCities project and our organization, there is a need for developing it to enable comparison between projects. Making use of online and emerging AI technologies seems to afford better implementation. Through studying transformation pedagogy and Transition Design, we hope to develop the transformative potential of PIAP to build it into a process that supports change.

Keywords

Impact Assessment, Frame Innovation, Futures Wheel, Design Thinking, Sustainability, Transition

1. Introduction & aim of this article

This paper outlines our work on prospective impact assessment and its process (later: PIAP) at its current state. We will describe our first version of PIAP together with its background, methods, and tools behind it. The goal of this paper is to help us structure our work, set the stage, and find out our scope in the wider context. Simultaneously it will help us tie the process we are developing to what has been done and written by others. At the end of the article, we present our reflections on the work and its further development during Future DiverCities project (later: FDC).

2. Background and current need for the impact assessment in FDC

FDC aims to influence how urban spaces can be sustainably revitalized through culture. FDC is a four-year project (2023–2026) funded by the European Commission (Creative Europe) and implemented by European organisations seeking to re-imagine culture-led regeneration of urban empty spaces in an ecological way. The project has pilots in 9

European Cities: Berlin, Zagreb, Split, Liepaja, Kuopio, Marseille, Florence, Timişoara and Athens. Each pilot has its mechanism which is believed to make change according to FDC's Theory of Change. (FDC, 2021.)

Theory of Change is a method that helps identify and explain how an intervention can lead to desired change in a specific context. It involves a participatory process that fosters consensus among stakeholders. The method begins by clearly defining the project goal or goals. From there, the team works backwards, envisioning a series of causal events that would lead from the present to the desired goal.

While this process involves some degree of imagination, it is crucial to substantiate the proposed pathway with scientific justifications. Throughout the method, the objective is to uncover underlying assumptions that, if unaddressed, might hinder the realization of the goal. It is important to define the goals as specifically as possible, as this enables a clearer understanding of the pathway and facilitates the assessment of its feasibility. Concrete goals also facilitate the creation of metrics that can be used to monitor the project's progress and success.

(Center for Theory of Change, n.d.; UNDGDOCO, 2017.)

FDC seeks to prepare creative hubs' leaders to lead bigger conversations about sustainable urban regeneration by putting ecology at the core of their organisational development and ethos. This will contribute to changing the paradigm in terms of cultural policy development with ecology at its heart.

In addition to the abovementioned pilots, FDC involves parties whose mission is to help these pilots achieve their goals. Our team in Savonia UAS has the role of leading the process and coordination of FDC's impact assessment. Our contribution is to produce a process for the pilots to help them anticipate the impacts of their work as early as possible. FDC is a culture-led project aiming for social and ecological sustainability, and our work has been guided by this ethos.

At the same time, FDC aims to respond to challenges and needs to foster cross-sectoral learning and collaboration at a local level to accelerate the production of sustainable solutions and approaches. We believe that our approach to impact assessment can offer necessary solutions by integrating future-oriented design thinking and its methods, which encompass participatory, informal, and holistic learning, into the process. Our process should also consolidate the ecosystemic capacity of the cultural players to become eco-conscious changemakers. Both these objectives have been pointed out in the FDC project plan.

According to the observations from the first FDC and, as the New European Bauhaus states (NEB 2023), responding to complex challenges requires a transdisciplinary approach. Thus, a solid collaboration is seen as an engine for change-making (FDC 2021). As an interdisciplinary team of representatives from creative professions, we wanted to use our professional assets and bring our future-oriented way of design and creative thinking to the table (ref. *Transition Design* and *Transformative Learning*). (cf. Salonen & al. 2023.) This approach is supported by the notion that societal and social systems are so-called soft systems whose boundaries are malleable and less clear (Vataja 2023, 94-98). In these kinds of complex situations, more extensive, continuous knowledge (experiential and transformative learning) and a developmental assessment (ref. *Desing Thinking* and *Frame Innovation*) are needed.

Vataja (2023, 89-109) has written a review of the assessment and effectiveness of systemic change. In this article, she points out that a certain kind of evaluation could help identify how and why pursuing a fairer and more sustainable future is needed. She also argues that currently used assessments need to be developed and renewed to better reflect the complexity of the operational environment and the decision-making needs. Vataja argues that a systemic change is needed on every level of societal structures and continues, that to understand how and why a social change occurs, one needs to understand and know about the concrete effects and how they arise because of interaction between different factors. In addition to impact chains (the so-called IOOI), new tools are needed to comprehensively examine the nature of change and interactions to help understand how changes arise.

Besides the theories of change, data collection and analysis methods, Vataja also refers to a more holistic evaluation. We find that the prospective impact assessment based on design thinking can be seen as means to deliver a more comprehensive and perceptive understanding of the nature of the problems or phenomenon, of activities that support continuous development, and – at the same time – to take into consideration the different scenarios of the people- and life-centred needs in the possible futures. (cf. Salonen & al. 2023)

3. Design thinking as a way to understand the significant impacts leading to a sustainable transition

It has been verified that it is typical for our current challenges that ecological and social needs and meaning cannot be separated (cf. Salonen & Salonen). To tackle today's wicked systemic problems, development processes require more comprehensive knowledge. Transition requires new thinking and learning out of the old. (Irwin & al. 2022.)

In the previous FDC (2016-2020), an assessment of the planned and made actions was included in the project and implemented by Savonia UAS. The assessment at that time was based on the material collected in four workshops organised in Bergen, Zagreb, Liepaja, and Kuopio. The methods used during the assessment were Prospective Rapid Impact Assessment for Human Security (PRIA) and Portfolio Decision Analysis (PDA). The then-created project assessment was realized to fall short of the perception of the complex and dynamic reality. This observation led to some of the main developmental dimensions on which the working team continues its work now. Those results have provided a starting point for the methodical development work of the PIAP, intending to use a more holistic and systemic approach. (Paldanius & Kajanus, 2021.)

Transition can be made possible through key design perspectives: envisioning a desired transition, using a variety of theories and methodologies that explain the dynamics of change within complex systems, and difference-making through collaboration and self-reflection to find and learn new perspectives. (Irwin & al. 2022, 50-54.) Our approach to this, in this study and development, has been to base PIAP on *Frame Innovation* by Kees Dorst (2015). Frame Innovation is a design innovation process that aims to understand problems in a practical and human-oriented way. At its heart, solving a problem requires the ability to take on new perspectives. The key elements of Frame Innovation are its

human-centeredness and the concreteness it brings to planning. We later realized that the included changing of perspectives is connected to transformation as well.

Design Thinking has been studied extensively. It can be seen as a generally positive and problem-solving attitude and a co-sense-making process: reflection-in-action (design abstraction) and pursuing parallel lines (framing new possibilities). Design thinking is characterized by questioning both the outcome of the things being developed and the means to achieve it. Parallelly, to create room for new connections, also all patterns of relationships in a challenging situation are questioned.

Dorst uses design abstraction to justify this: since we know only little about the desired outcome character in the early stages of development, it is not possible to assume what to do and how to act to achieve the goals. He states that framing is the key to design abstraction. It is achieved by creating new, parallel ways of looking, acting and connecting within a paradoxical problem situation. These parallel frames can be seen as possible futures from which it is then possible to choose a desirable goal.

(Dorst 2015, 49-56, cf. Salonen & al. 2023, 623.)

In Dorst's view, linking change to the needs of stakeholders reinforces change. In turn, we saw the concreteness of the planning, contained in Frame Innovation, as providing a better starting point for the prospective impact assessment: after creating concrete sketches of the project-related actions and outputs, it easier to envision their impacts compared to abstract project goals. This will produce an understanding of what actions and outputs are worth implementing.

The development of PIAP relies on various other theoretical perspectives, that are related to design thinking. One starting point for this work has been a holistic approach to understanding and being human, the importance of perceptions and experiential knowledge as part of cognitive processes and decision-making. Like cognitive scientists emphasize embodied cognition, " -- *you think with your body, not only with your brain*" (Kahneman, 2011, p. 62), we find it important to acknowledge the importance of feelings and emotions in thinking and doing, and also that this embodied approach creates room for better addressing the world outside ourselves. Also, Salonen & al. discuss *Epistemic Learning* which they see related to experiences that can bring forth new affective, intuitive, imaginative, and embodied knowledge (2023, 626-628).

Here, we see connections to the phenomenological studies of embodiment, which emphasizes human experientiality and knowledge based on human perceptions. Subjective sensations and experiences are seen as meaningful information. Especially, the French philosopher Merleau-Ponty emphasizes a corporeal and experiential relation to the world centred on a perceptive body rather than a thinking mind. (Keto & al. 2022, p.53; [Merleau-Ponty 1968].) In phenomenology, a research problem is approached from an open point of view without a precise scientific framework, and – from our understanding – this can be linked to a designerly way of thinking and framing. Cartesian dichotomy is claimed to emphasise a too-individual-centred human perspective (Martusewicz & al. 2015; Foster 2014). Creating new, broader thinking requires abandoning Cartesian rationalism for a more holistic and embodied relationship with the world. Furthermore, Salonen & al. (2023) have made similar notions when developing their *Planetary Social Pedagogy* Framework. They find that the key to sustainable transformation could be a deep, holistic and systemic understanding and a fundamental

shift in human thinking (621-622). This means "seeing things differently" and learning from experience using embodied knowledge (630). Transition Design, in turn, examines the phenomenon of mindset and worldview towards more holistic design actions and thinking (Irwin & al. 2022). This openness is also present in Frame Innovation, Design Thinking and Transformation Pedagogy.

4. The PIAP in praxis

Our iterative and participatory PIAP is based on design and future thinking aiming to foster a meaningful transition towards positive change. PIAP can and should be repeated multiple times throughout a project to refine the understanding of what is being done and where it seems to lead. Like Frame Innovation, our process is divided into three phases (Table 1). We have modified Dorst's process to better fit our purpose and, for example, added new steps at the end to envision potential impacts and assess the significance of the identified impacts.

Each iteration of the process starts with the reconsideration of the current situation. The workshop is built upon the growing understanding of the context, the problem, and the possibilities. The actual workshop starts with a somatic enquiry to root the participants into the present moment, location, and space and continues with collecting a wider understanding of all the stakeholders of the problem at hand. These data are then used as basis for brainstorming possible solutions that benefit as many groups of stakeholders as possible. The best solutions are processed further through storytelling to make them more coherent and concrete. The concreteness of the stories helps to envision the possible impacts of the chosen solutions through the *Futures Wheel* method. The impacts are then refined into impact statements which are eventually evaluated numerically. Through these numeric evaluations of the impacts, it is in turn possible to evaluate the effectiveness of the actions causing the impacts. These evaluations and the other data created during the workshop can later be processed further to assist in decision-making about the desired path of action for the project.

Phases	**Steps**
1. Pre-phase (core team)	1.1 Re-research › Understanding the context and the framework of the venture › The main question › The Theory of Change
	1.2 Initiation › The current situation of the venture › Criteria vs. Impacts › The workshop theme › Workshop preparation

2. Participatory-phase (core team and stakeholder representatives)	2.1 Rooting into now › Feel the space › Dreaming: What could be?
	2.2 The Field › The stakeholders and their needs
	2.3 The Paradox › Contradictions hindering the change
	2.4 Themes › Choosing the path
	2.5 Framestorming › Brainstorming new and possible futures
	2.6 Storytelling › Storytelling and -boarding new futures
	2.7 Futures wheel › Recognizing the impacts
	2.8 Impact statements › Collecting and writing data down
3. Post-phase (core team)	3.1. Evaluation › Impact statement evaluation (by stakeholder representatives using INTO tool)
	3.2 Transformation › Analysis and reflection
	3.3 Integration › Paths to action › Mapping out the activities that need to be done › The Change

Table 1: The outline of the Prospective Impact Assessment Process

The chapters below, explain the different steps of the PIAP in more detail.

4.1 Pre-phase

Pre-phase is about understanding the context, the problem and the stakeholders. The current situation should always be addressed and considered before the actual workshop. At a very early stage of a project, the **Re-research** step involves a thorough investigation of the matter at hand. Later, when the project has been running for some time already, this step is rather about making sure the upcoming workshop is really about the current situation and understanding of the project: Is the project still aligned with the goal and

the chosen theory of change? What new has been learned during work? Choosing the steps of the workshop depends on this, e.g. If concrete plans have already been made outside the workshop, the *Framestorming* –step can be left out.

The **initiation** step is about making the actual preparations for the workshop: scheduling, inviting the participants, and preparing the facilities and the tools. Here, it is important to consider the criteria that will be used for impact evaluation at the end of the process. These criteria should allow for assessments like: "[The impact] will have [a little/somewhat/very] [positive/negative] effect on [criterion]." On some projects the project criteria can be used directly, on others, some adjustments will be required. For example, during early experiments, we noticed that the focus areas of FDC (biodiversity, commoning and impermanence) fitted only partially as impact criteria. Biodiversity and commoning suited better but impermanence didn't because it was difficult to understand what it would mean if, for example, something would have a very positive effect on impermanence.

4.2 The participatory phase - Impact assessment workshop and methods

In this chapter, the participatory workshop methods will be presented and discussed. At this point, the previously presented cornerstones of design thinking are all in action at the same time. This is a complex process of interplay and learning together and from others, where co-creative relationships foster new thinking and transition. As Salonen & al. (2022, 633) describe, participants learn and develop collaboratively, doing reflection-in-action on reality, throughout the participatory experience. The workshop should span over two days.

4.2.1 Somatic experience

The workshop should begin with experiencing the location somatically. Through this **Somatic** step, we want to bring experience-based body knowledge into further discussions. When implementing the workshop for the first time in Londa, Italy in autumn 2023, we sent the participants out walking in the area and taking notes of their experiences and thoughts about the location. This was seen to help the participants be better in touch with their bodies and the location.

One reason for starting the workshop with a somatic practice is to give everyone a chance to evoke and write down their sensations, experiences and thoughts before engaging in group work. This should help the quieter ideas to be expressed. Otherwise, the loudest ideas may receive too much attention (Kahneman, 2011, p. 97).

4.2.2 The Field and the Paradox

In the **Field** step, the stakeholders are mapped out with their needs and gifts (Fig. 1). All the possible stakeholders of the matter at hand should be recognised. Both people and nature should be considered as stakeholders. This will create an understanding of what is important to each of them and what they can bring to the table. Engaging with

stakeholders and communities is essential for ensuring that solutions are developed participatory and inclusively and that the needs and preferences of affected nature and individuals are considered. (Dorst, Kaldor, Klippan, & Watson, 2016, p. 171.) To date, we haven't had time to implement this, and it will be the next step in our FDC workshops.

The **Paradox** step is about identifying the paradoxes and contradictions in the situation: Why is change difficult? What makes the problem hard to solve? The reasons may be personal, social, circumstantial or something else. Addressing paradoxes can help uncover hidden assumptions and biases and ensure that the actual problems are solved instead of just the symptoms. (Dorst, Kaldor, Klippan, & Watson, 2016, p. 167.)

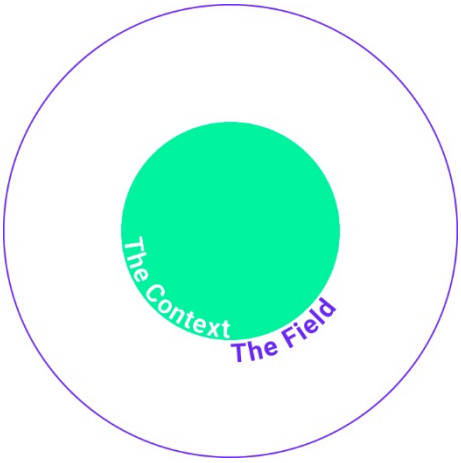

Fig. 1: The Field can be visualized with a Territory Map. The Context contains those stakeholders who are tightly knit into the project. On the Field are the stakeholders who are not directly involved but may be affected by the project.

4.2.3 Themes

Prioritizing key **Themes** and issues helps to focus the problem-solving process and ensure that resources are allocated effectively. Seeing similarities between the needs and gifts of different stakeholders will help create synergy. Theming is done using *Affinity Diagramming*, where similar stakeholder needs and gifts clustered with the notes from the somatic step. Groups that tie together more stakeholders are better. Conducting several iterations may create more possible - and possibly better - combinations. (Dorst, Kaldor, Klippan, & Watson, 2016, p. 173.)

4.2.4 Framestorming and Storytelling

To honour Frame Innovation as the origin of our process, we named our ideation step **Framestorming**. This reminds us that this phase is about shifting perspectives and finding new ways to feel, think and see the problem and the goal. This step is built into our impact assessment process because the plans from the first FDC seemed too abstract and required refinement and more concreteness. We anticipate similar experiences in other projects.

The best ideas are breathed into life with storytelling in the **Storytelling** step. Here, the workshop participants transform their ideas into visualized stories. The narrative form forces coherence and concreteness, which are meant to ease up the recognition of impacts. Stories also help embody the solution scenarios because they allow identification with the characters in the stories and evoke emotions. This should deepen the human understanding.

4.2.5 Envisioning the impacts with a Futures wheel

The earlier steps afford a vision of the future where the project's actions have been defined and described. To see the impacts of those actions, we chose the **Futures Wheel** because it seems to help produce a rich variety of possible impacts. As a sort of mind map, the Futures Wheel is a divergent tool, that is used for recognizing as many impacts of a defined phenomenon as possible. This is done by dissecting the possible impacts into smaller, more comprehensible pieces, through which it is then easier to think of further impacts. (Benckendorff, 2008.)

The Futures Wheel concentrates on the recognition of different impacts but does not address their probability. Understanding the probabilities of different impacts would help prioritize actions that most likely have desired impacts. We considered asking participants for probability estimations during the workshops, but research shows that this is difficult and will most likely produce unreliable results (Kahneman, 2011, p. 335).

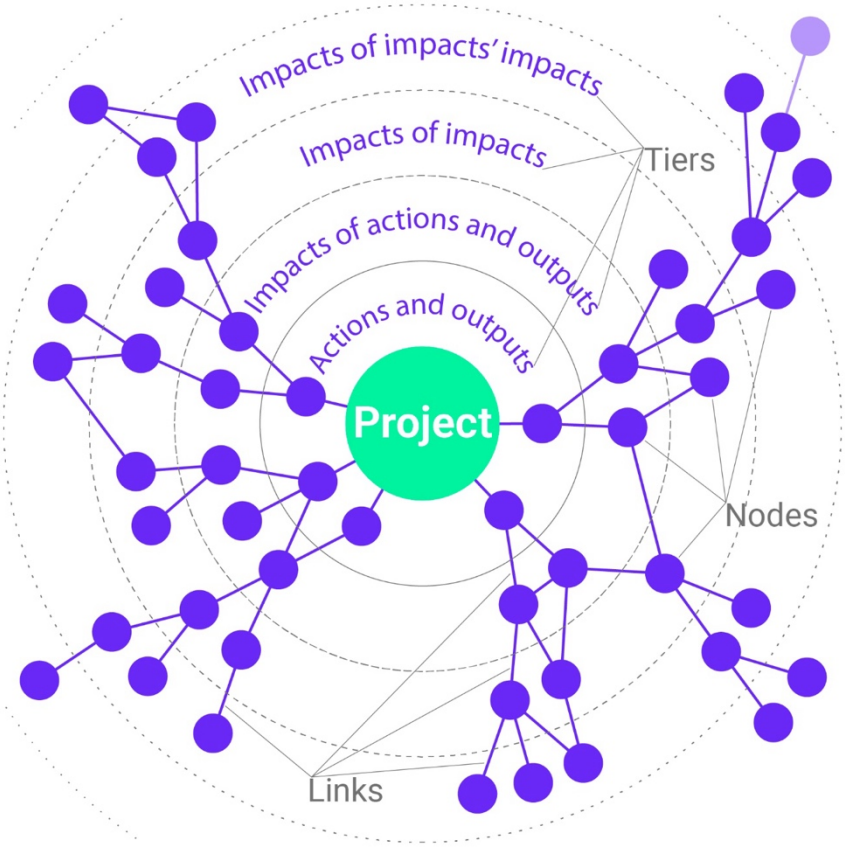

Fig. 2: The Futures Wheel is an outward expanding tool that facilitates the mapping of the impacts one by one.

The Futures Wheel is implemented by collectively brainstorming the impacts of actions depicted in the created stories. The impacts are revealed in outwardly expanding ripples, one circle at a time. Cause–effect thinking has been seen as one of the three main ways human minds connect thoughts (Kahneman, 2011). This seems to imply that it should be quite natural to humans. Despite this, the Futures Wheel has seemed a difficult method. How could we better facilitate this mindset?

Because of *WYSIATI* (What you see is all there is), the discussion in the workshops may easily guide the participants' ideas. Furthermore, A project's impacts should be considered in a larger context (SDGs, Agenda 2030) because there can be crucial impacts outside the

scope of the project. We wanted to facilitate an outside view and added a list of value dimensions that would help participants check they have discussed the possible impacts thoroughly (Kahneman, 2011, pp. 257-258). Each tier of Futures Wheel consisted first of free discussion and after the ideation was exhausted, the participants were asked to go through a list of six value dimensions to see if they hadn't thought of some impact. We chose the value dimensions from the Design Value Framework: Planet (environmental impacts), Democratic (political impacts), Social (socio-cultural impacts) and Financial (financial impacts) (Design Council, 2022). To these, we added the value dimensions 'positive' and 'negative' as we wanted the participants to think about the impacts also in these terms. We wrote the value dimensions on separate cards to allow more freedom during the discussion. It seemed that, written on canvas, the value dimensions might misguide the creation of the Futures Wheel by locking areas of the canvas only for certain themes (Glenn, 2009). Without these cards, the political impacts would have been completely absent in one workshop. In the end, the political impacts proved to be the most important discovery that the pilot in question had to tackle first to be able to solve their challenges. Here, the importance of an outside facilitator was also concretised. The free discussion during the Futures Wheel was seen as important because the topic and the already recognized impacts may provoke ideas of new impacts and this needed room. We wanted to use the value dimensions only as a safety net to ensure nothing important had been left out.

4.2.6 Impact statements

A ready Futures Wheel canvas can seem quite messy (Benckendorff, 2008, p. 31). To make its results more useful, we had workshop participants create sentences from those impacts that seemed important for their endeavour. We called these sentences impact statements, and instructed the participants to write them using the same structure as had been used for the Theory of Change -sentence throughout the FDC: to_____, with_____, by_____. We thought that this structure would help others understand the impacts better, remember later what they were about and compare the impact statements with the theory of change driving the pilots.

4.3 Post-phase – Building from the results of the workshop

To make use of the data created during the workshop, it has to be processed. After the Impact statements have been created, they are grouped by their causing actions (Fig. 3) and uploaded into the INTO tool for a numerical **Evaluation**. INTO is an online tool developed by Savonia UAS for similar evaluations. With INTO the participants can evaluate numerically things on – usually 2 to 3 – selected criteria. The tool can then process the data using Portfolio Decision Analysis to calculate the best-evaluated things regardless of the weighing of the criteria.

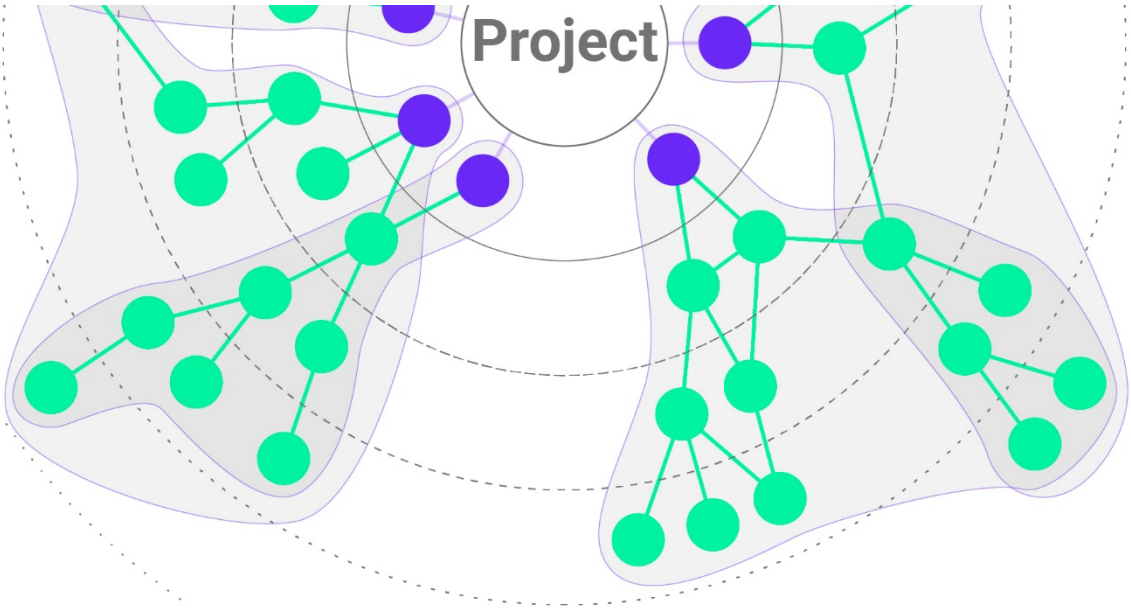

Fig. 3: The Impact statements (green: impacts) were clustered by the actions and outputs (purple) causing them. This supports the comparison between different actions.

For the impact assessment, it was chosen that the criteria should be such that afford a positive–negative -evaluation. This way the participants could assess both the strength of each impact as well as the nature of the impact. We hypothesise that this may lead to more reliable assessments.

As the impact assessments are grouped by their causing actions and outcomes, the INTO evaluation leads to an evaluation of the actions and outcomes. This should help further planning of the project: Which actions and outcomes should be discarded, developed or pursued? Currently, the responsibility of setting sustainable criteria lies on the shoulders of the project and the impact assessment teams.

The goal of the **Transformation** and **Integration** steps is to first analyse and reflect the results of the PIAP. The chosen actions and outcomes are then developed, refined, and implemented further into reality. Along the way, new iterations of PIAP are carried through to refine the work. During this process, informal learning happens. Without it, a real change is impossible.

5. Conclusions, reflection and discussion

The FDC pilots are being used as testbeds for developing the impact assessment process. To date, PIAP has been established and taken into use in three pilots of the FDC to evaluate impacts on the FDC's themes and The Theory of Change: biodiversity, commoning, and impermanence. This has given us preliminary feedback on the usefulness of the method but further applications with the pilots are needed. During the development of this process, scheduling has been a touchstone. Finding enough time for the workshop has been problematic and we haven't been able to run the workshop through in its entirety, yet. This has forced us to streamline the process, which is also important. Yet, we feel that for a proper understanding of possible impacts, more time should be invested in impact assessment.

The process steps are quite clear and can be easily applied to the pilots. However, it is too early to make conclusions. The FDC pilots will be running until 2026, and PIAP will be conducted during this period. The PIAP helps to direct the attention from outcomes to the impacts of actions when designing the pilots. Currently, impact assessment is highly context and local condition specific. Its results are relevant regarding the question: "What should be done next?" From an investor's point of view, it would probably be more interesting if the assessment helped set the impacts in proportion to the project resources, and if it enabled a comparison between projects even before they have started. (Cf. Irwin & al. 2022, 50.)

Our work on PIAP has grown organically, rooting in the previous step of the FDC and fertilising on the expertise of our team that joined it at the second step. Writing this text has been a process of learning, as is the development of the PIAP and as will be our presentation at the UIIN conference in Madrid 2024. Most of us are newbies in all this. From the experience of writing and presenting this work, we expect to get new ideas for our work and learn what others outside the scope of the FDC think about it.

For FDC, the PIAP is a new method, where co-learning from Design Thinking, Frame Innovation, and Portfolio Decision Analysis occurs. The process has shown that to recognize meaningful impacts, it helps if the creative HUBs/pilots can experiment with their planned actions somatically in real life and shared situations. This helps to consider the needs of those involved in the community and to create concrete plans based on them.

So far, we have learned that experience-based impacts and their interpretations are always situational, place-and-time-bound to the moment of assessment, and that learning emerges from local conditions and the current situation of the things being developed. A status and views of impacts emerge as development progresses and the assessment of impacts renews and unfolds at every stage of the iterative process, as the developers' understanding expands and the transition of thought occurs. Therefore, several iteration rounds are needed, just as is customary in design-based development and innovation processes.

5.1 Plans and visions

The PIAP allows alternative solutions to be examined through their impacts. Identifying complex impact chains visually helps to identify systemic linkages between the impacts. (cf. Salonen & Salonen 2023). Framestorming and Futures Wheel enable developers to open their future horizons and new perspectives.

As Dorst suggests, the Frame Innovation, and – deriving from it – PIAP also, could drive the ability to see, think and do differently. We find that creative and radical design thinking is experiential learning by nature. In this kind of learning, an open and curious attitude as well as divergence, convergence and chaos vary in a dynamic process. Our work and understanding have emerged organically through the practical development of PIAP and applied sciences. In conclusion, the FDC and the PIAP, both could be seen as ideal initiatives applying and combining Planetary Social Pedagogy (Salonen & al. 2023) and The Transition Design Framework (Irwin & al. 2022). Thus, there has arisen a need to study these fields more deeply to develop the PIAP further. Transformative learning could be built into it using design thinking (what if? and How might we?). It would be interesting to learn more about this.

The development of bodily methods at the beginning of the participatory phase of PIAP is only just a beginning. There has been little time to test this part, but we consider the bodily approach to be important and that is why we want to bring it up and study more. If the project is location-focused, it is best if the PIAP can be done in the location, since this will help participants experience it somatically. We've also pondered upon the possibility of a project with a more abstract subject: How could we adapt the somatic approach in such circumstances? We believe it matters there as well.

There are several questions considering the use of the Futures Wheel. As the Futures Wheel helps to build a rich view of the possible impacts, it may also help to recognize amplifying or balancing circles of causality. In systems thinking, identifying, and addressing these cycles has been seen as one way to support change (Senge, 2006, pp. 82–83). So far, the results of the Futures Wheel haven't been examined through this lens and it seems that this would require extra care while marking the connections between the impacts.

Regarding the list of value dimensions used during the Futures Wheel, we currently think that a short list covering a broad spectrum of matters deemed important seems most promising because we feel that this impact assessment process creates a glimpse into potential futures where important, desired, and undesired impacts may be caused by impacts beyond the scope of the project. Yet, it may be that the list should be constructed based on some other goal.

Machine learning might be useful for generating different impacts, and it could help identify such events that do not necessarily occur to the participants in a workshop situation. However, we think that the identification of impacts shouldn't be left solely to AI based generation, because the proposals produced by AI will be based on the background information fed to AI. This possibility should nonetheless be explored further.

Regarding impacts seen with the Futures Wheel, one should consider the difficulty to properly determine the probabilities of the various impacts. One option we've considered is simulating different probabilities using PDA. Preliminary discussions have anticipated problems with this approach, and we have not had time to try the idea.

In the future, the PIAP could be used and applied in different contexts for prospective impact assessment. As a future challenge, a need to improve online applications to support the process has been identified. For example, the Futures Wheel can be developed into an online application. Also, we have identified the need to develop a course in which both making change and thinking about transition can be learned. We will consider establishing a formal e-learning platform where PIAP can be practiced and supported by engaging in transition-related tasks.

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