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On transforming transition design: from promise to practice

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We are living in transitional times. Much has been under debate on the need to change and to cope with societal transitions, less emphasis, however, is devoted on how to do so. Therefore, one of the primary questions in Transition Design is *how to design for sustainability transitions?* The current work aims to evaluate 'transition design studies' by analysing and evaluating the current available practice of transition design in order to contribute to the field in two ways: first, by maturing through evaluation, and second, by identifying points of further research. Our findings show that three phases can be distinguished within transition design processes: *Design research* to understand past, present, and to envision the future; *Designing interventions* to create the right thing, at the right place, at the right time, and *Design practice for transition* that accumulate the design interventions in order to drive societal transitions.

Keywords: Design methods, persistent problems, sustainability transitions, systemic change, transition design

Introduction

Current transitional times are often referred to as the *Anthropocene*: an epoch caused by human activity, as opposed to a natural process. Crutzen and Stoermer (2000) explain that "*Human activities are exerting increasing impacts on the environment on all scales, in many ways outcompeting natural processes*". Even though, the concept of the Anthropocene has been well-motivated, many people have difficulties in accepting both the concept and the consequences. The corresponding objection towards the Anthropocene is causing social tension, trivialising this topic to a rather normative debate skewed by beliefs and values, rather than a scientific debate about evidence and explanation (Steffen, Grinevald, Crutzen, & McNeill, 2011). Despite the trivialising of the topic and the endless debates, we *do* find ourselves in the middle of a global transition - with an outcome unsure, depending on how environmental, economic, and social *persistent problems* are resolved (Raskin, Banuri, Gallopín, Gutman, Hammond, Kates, & Swart, 2002). Persistent problems (Dirven, Rotmans & Verkaik, 2002) are the superlatives of wicked problems (Rittel & Webber, 1973). Differently put, persistent problems are the result of the flaws within our current economic and societal system, and can only be combated by fundamental change and the restructuring of our societal systems (Rotmans & Loorbach, 2008). The nature of persistent problems is extremely complex, due to their roots in different societal domains and the diversity of stakeholders (Rotmans & Loorbach, 2008).

Although the word *problem* is often associated with the word *solution*, for persistent problems this is not the case, due to their complexity. Persistent problems need to be broken down into digestible nodes, which can be addressed through the creation of smaller solutions, or interventions (Rittel & Webber, 1973; Rotmans &



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Loorbach, 2008). The accumulation of those smaller solutions and interventions could lead to the transition of a persistent problem. Therefore, instead of solving persistent problems, we refer to *transitioning* persistent problems. A deep understanding of the system, the relations, and the components of the problem is required to do so. Transitions are understood as long-term, complex, and non-linear processes of systemic change (Mulder & Loorbach, 2018). In the current work, we refer to a more detailed explanation of transitions introduced by Rotmans and colleagues:

A transition is the result of developments in different domains. In other words, a transition can be described as a set of connected changes, which reinforce each other but take place in several different areas, such as technology, the economy, institutions, behaviour, culture, ecology and belief systems. A transition can be seen as a spiral that reinforces itself; there is multiple causality and co-evolution caused by independent developments. (Rotmans, Kemp, & van Asselt, 2001, p. 16)

Due to the relevance and the urgency of persistent problems, the concept of transition has been widely discussed and broadly studied. Over the years, 'transition studies' has become an academic field (Escobar, 2015). In order to facilitate a new way of formulating and implementing policy for sustainable development in the short, mid and long-term, Rotmans and his colleagues have introduced the term 'transition management' to study transformative change processes in socio-technical systems (Rotmans et al., 2001; Geels, 2002; Kemp et al., 2007; Loorbach, 2010), resulting in a variety of frameworks and theories describing transformation and change. Geels (2002) developed a socio-technical landscape that depicts how transitions move through different abstraction levels of our society. Loorbach (2010) created the so-called transition management framework and cycle to make a distinction between different types of transition management, and what their functions are, and to bring this theory into practice. Werbeloff, Brown, and Loorbach (2016) studied what patterns transitions follow in order to understand how they manifest and move with, the aim to identify relevant and strategic agency opportunities. Through those theories and research, we seemed to have gained a lot of knowledge and insight in how transitions work: how they happen, in what ways they take shape, and how they are structured. Nonetheless, we have not found a way to structure, steer, or accelerate ongoing transitions. In other words,

We need to be clear that so far, transition management has been mainly implemented and conceptualised as a "shadow track" in which new visions, ideas, and agendas can be developed in a more innovative way than within the context of regular policy processes" [...] "it leaves open for further research the fascinating question of how the basic ideas and principles underlying transition management could be translated into specific operational models that would be more in tune with other phases in policy- and decision-making processes. (Loorbach, 2010, p. 178)

The severity of persistent problems and the urgency to address them, cannot be overstated. Although, this has been a topic of talk and research for years, fundamental change of the system has not occurred. There is little action to actively shape, control or guide this change. During the Climate Conference 2018, Greta Thunberg, a 15 years old girl from Sweden, nicely pointed out the problem to the UN: *"Until you start focusing on what needs to be done rather than what is politically possible, there is no hope. We cannot solve a crisis without treating it as a crisis"*. She correctly understood we have to move towards *action*: the growing severeness of persistent problems is accompanied by a growing *urgency to act*. This is where transition design comes to the play. Complementary to the transition management field, it aims to move *from understanding towards action*. Pointed out by Hughes and Steffen (2013), Jensen (2017) as well as Porritt (2013) there is a need for a new, design-led approach to address the complex, wicked problems confronting societies in the 21st century and to seed and catalyse societal transitions toward more sustainable and desirable long-term futures (from Irwin, 2018). The next section elaborates upon the role of design in transition studies.

Transition design

The design discipline has successfully evolved itself into a profession that addresses business and social issues with the use of design principles. Now, the design discipline is researching and experimenting how it can evolve itself into a discipline that is able to address complex persistent problems and to transform society, under the flag *transition design*. Transition design aspires to become an integrated discipline with a variety of knowledge and skills, that acts as an agent to facilitate, accelerate, and steer transitions. It is unique in its design-led approach and the ambition to integrate frameworks, processes, tools, and methods from a variety

of fields. This discipline emerged from the Carnegie Mellon University around 2011: Irwin and her colleagues explain the philosophy of transition design as following:

Transition Design advocates the reconception of entire lifestyles, with the aim of making them more place-based, convivial and participatory and harmonizing them with the natural environment. Transition Design focuses on the need for ‘cosmopolitan localism’, (Manzini 2009; Sachs 1999) a lifestyle that is place-based and regional, yet global in its awareness and exchange of information and technology. Everyday life is viewed as a potentially powerful, transformative space (Lefebvre 1984; Gardiner 2000) where transition designers explore ways in which basic human needs are satisfied locally, within economies that exist to meet those needs (Max-Neef 1992; Illich 1987; Kamenetsky 1992). This is in contrast to the dominant economic paradigm that is predicated upon unbridled growth and an imperative to maximize profit (Korten 1999. 2010; Mander 2012; Douthwaite 1996). (Irwin, Kossoff, Tonkinwise & Scupelli, 2015)

Further elaborating upon this philosophy, Boehnert, Lockton and Mulder (2018) sharpen the role of *design* in transition design in their editorial for the recently organised Designing for Transitions track held at the Design Research Society conference in June 2018:

*Whether considered in terms of everyday social practices, at a community scale or at the level of global challenges, a framing around designing for transitions brings together considerations of temporality, futures, different types of literacies, participation, social innovation, human needs, and interconnectedness; **designing for transitions involves designing how transitions are conceived, enacted, governed and managed.** (Boehnert, Lockton, & Mulder, 2018, p. 892)*

Clearly, the role, the value, and potential of transition are well-defined and explained, as the design discipline is paying more and more attention to transition design. The topic is addressed in academic literature and conferences. Nonetheless, and more importantly, just a very limited number of academic case studies can be found that carried out and validated methods and tools, and thereby the potential of transition design. As the purpose of transition design is to *thrive action*, the (academic) focus of this discipline should shift towards development and validation of methods, tools and the potential of transition design through experimentation. Note that this does not rule out the variety and value of projects carried out on local, national or business level in the theme of *transition*: it is rather a critical note that in order to further develop the academic field of transition design, scholars should focus on analysing and evaluating those cases. Development of the academic field might also increase the value of non-academic projects, as it allows to move from random experimentation and trial-error process, towards a structured process and best practices.

In order to move from theory to practice, the current work aims to evaluate the transition design *practice* by analysing and evaluating the current available practice of transition design. The goal is to evaluate *how* and *where* the field can mature, to specify in more depth *what* should be developed, and to propose from *which* disciplines and practices, transition design can draw inspiration from that can contribute to achieving its ambitions.

Method

First of all, it is important to note that *transition design* is a relatively new discipline, and the term *transition design* is not a specific term particularly used for the transition design field. The other way around, *transition projects* are not always carried out under the flag of transition design. This makes researching this field tricky and fuzzy (Werbelloff et al., 2016). This study aims to *evaluate established practices of the transition design field* based on academic case studies that use transition design methods, tools, and frameworks as we aim to *map* and *evaluate* this specific discipline. Consequently, an online search strategy using the term “transition design”, has been carried out. However, the search term “transition design” did not result into much results for the reasons explained above. Therefore, additionally the terms “design for sustainability”, “design for systemic change”, and “design for social innovation” are researched in order to find *case studies that do use transition design methods, tools, and/or frameworks*. Those terms are chosen based on a framework, created by Gaziulusoy in 2015, that visualises linkages, overlaps, and complementarities between different Design for Sustainability approaches. In this framework, Design for Systems Innovations and Transitions, evolves from and overlaps with systemic design, social innovation, and design for sustainability.

The search has been applied twice; once, broadly through google scholar, and once, limited to three leading design journals, i.e., Design Issues, Design Studies, and Design Philosophy Papers. Alongside this literatures search, the emerging design field has been studied by reviewing the themes addressed in recent call for papers announced on the websites of well-known international design conferences, i.e., European Academy of Design 2017 (EAD12), Design Research Society 2018 (DRS2018), and Relating Systems Thinking and Design 2018 (RSD7). Publications meeting the following inclusion criteria are analysed: academic work that carries out a case-study with real users in order to test proposed frameworks, processes, and tools *developed for transition design*. This analysis has been done by structuring the frameworks, processes, and tools in a table (see Table 3). More precisely, each step or phase of a particular method found, the goal(s) of the step, how this step is carried out and the comments on those steps have been extracted. In this way, an overview of the available methods and their relation towards the step and goal has been created.

Results

The current section presents the results of our review, and is structured as follows. First, results following our search strategy are reported, presenting findings from the literature research and design conference calls, respectively. Next, the found frameworks, processes, and tools meeting the inclusion criteria are described.

Results: literature

Table 1 shows the results of the online literature research found via google scholar, and in the three design journals, Design Issues, Design Studies, and Design Philosophy Papers. A total of almost 13 million papers have been found (n= 12,908,889); 288,889 publications were found in the three journals, and 12,620,000 via google scholar. However, from this abundant number of hits, just a small amount of those papers is related to the transition design field, which has been concluded based on the title, and scanning the abstract from those papers. Through this online research, no publications meeting all inclusion criteria have been found.

Table 1 Results of literature review through google scholar and design journals

Searching engine	Terms	Results
Google scholar	"transition design"	n=5,970,000
	"design for sustainability"	n=3,200,000
	"design for systemic change"	n=3,450,000
		Total result google scholar n=12,620,000
Design Issues	"transition design"	n=11
	"design for sustainability"	n=112
	"design for systemic change"	n=45
total results		n=168
Design Studies	"transition design"	n=268
	"design for sustainability"	n=264
	"design for systemic change"	n=66
total results		n=598
Design Philosophy Papers	"transition design"	n=72
	"design for sustainability"	n=196,838
	"design for systemic change"	n=91,223
total results		n=288,133
		Total result journals n=288,889
		Total result journals & google scholar 12.908.889

Interestingly, the results show that the field of Transition Design is emerging, as relevant papers start being published from 2015 onwards. The work by Ceschin and Gaziulusoy (2016) explicitly indicate that the first, and only three, PhD's on the topic have been completed recently; Ceschin in 2012, Gaziulusoy in 2010, and Joore in 2010. The results also show the field is gaining attention within the design discipline: "Transition Design" (Kossoff, Irwin, & Willis, 2015) and "Transition Design Provocation" (Irwin, Kossoff, & Tonkinwise, 2015) are the second and fourth most read articles from Design Philosophy Papers. Furthermore, Ceschin and Gaziulusoy (2016) pointed out that transition design is also getting attention in the design education, as a group of scholars (Irwin, Tonkinwise, & Kossoff, 2015) has developed a curriculum on what they call transition design for the first time.

Results: design conferences

Our search in call for papers of recent design conferences confirmed the increase in attention for the transition design field: the European Academy of Design 2017 (EAD12), Design Research Society 2018 (DRS2018), as well Relating Systems Thinking and Design 2018 (RSD7) included transition design related tracks in their conference program. Table 2 provides an overview of the tracks and proceedings that are based on the field transition design.

Table 2 Results of design conferences search

Design conference and title	EAD12, 2017 "design for next"	DRS2018, 2018 "catalyst"	RSD7, 2018 "Challenging complexity by systemic design towards sustainability"
Transition design relevant tracks	- Design for next economy - Design for next environment - Design for next society - Design for next thinking	- Designing for transitions	- Models and processes for systemic design
Hands-on design practices included in conference proceedings		The Emerging Transition Design Approach	Systemic design toolkit

Results show explicit mentioning of the topic "transition design" in the DRS2018 track "designing for transitions". In EAD12 and RSD7, the topics "design" and "sustainable transitions and futures" were combined in tracks, but *transition design* was not explicitly mentioned. Through this research, two interesting results are found. From the proceedings of DRS2018, an elaboration and pilot of the emerging transition design approach by Irwin and colleagues (2015) has been found. The proceedings of RSD7 refer to the Systemic Design toolkit (2018) developed by Namahn (Belgium human-centred design agency) and shiftN (futures and systems thinking studio from Brussels). Both propose a framework, method and tools specifically aimed at *designing transitions*. However, only for Irwin's framework a publication that meets the inclusion criteria has been found. This publication has been selected for a further, and more in-depth analysis on design methods, which is elaborated in the next section. As the further analysis consists of only one case-study, The Systemic Design Toolkit is used in the discussion complementary to Irwin's framework, for a synthesis and evaluation of the transition design practice. These two results are in the remainder referred to as Irwin's framework and the Systemic Design toolkit.

Results - analysis of the Transition Design Framework and Approach

Since 2014, the Transition Design Framework and Phased Approach developed by Irwin and colleagues, has been integrated into programs and curricula at the Carnegie Mellon University's School of Design. A first case study entitled "*The Emerging Transition Design Approach*" that applies this framework and approach has been presented at DRS2018. In this paper, Irwin (2018) evaluates the use of the framework and approach based on one case-study. Table 3 shows a further analysis of this transition design framework and approach with a particular focus on the design methods used.

Table 3 Transition design framework & approach analysis (* these references can be found in Irwin (2018))

Step	Goals	How	Comments
1. Reframing present and future	1.1 Mapping the problem in the present (<i>creating the big picture</i>)	Stakeholder groups collaboration (<i>co-creation sessions</i>) Visual map (<i>visualization</i>) Identifying relations in map (<i>structuring the problem</i>)	Participants believes to be 'true' where challenged Process fostered empathy between stakeholder groups From 'confrontational' to 'co-creation' through discovery and playfulness
	1.2 Mapping stakeholders concerns and relations (<i>form individual perspective towards collective perspective</i>)	No design methods From other fields Needs-Fears Mapping (Wageningen University 2017)* Conflict Analysis Tools (Mason and Ruchard, 2005)* Multi-Stakeholder Processes (Hemmati, 2002)*	Lack a component of action Made people aware of their own cultural norms, beliefs and assumptions Prepared participants for future visioning by shifting their mindset
	1.3 Future visioning (<i>Envisioning and prototyping possible and preferable futures</i>)	Snapshots from 2050 (<i>narrative</i>) Create a worldview: first in small groups, later with whole group (<i>method 1:4:all</i>) Backcasting to create transition pathway (<i>backcasting and roadmapping</i>)	Shown there is much more room for solutioning when we think outside our paradigm, and this also unites different stakeholders Backcasting to make things concrete is highly challenging and there are not enough tools and not a structured process to do so
2. Designing interventions	2.1 Looking up and down systems levels in space, backward and forward in time (<i>discovering intervention points</i>)	What specifics of everyday life and individual practices contribute to the problem? (<i>user insight</i>) What current, large scale events, situations or trends contribute to the problem? (<i>trend analysis</i>)	Nothing indicated on how to do this
	2.2 Situate interventions aimed at transitioning the system toward the preferred future (<i>intervention design</i>)	Acupuncturists needles metaphor: situate the interventions at points they start to move things (<i>formulate design goal, design of intervention</i>) Amplifying projects (Manzini, 2015)*: look for what is already working at the grassroots level in order to support and amplify these efforts (<i>connect projects to vision</i>)	A table with design disciplines that are useful for intervention design is provided
	2.3 Multiple interventions at multiple levels of scale over multiple time horizons	No design methods used	The reaction of the system cannot be predicted The more complex the system, the more unpredictable the response
3. Waiting and observing	3.1 Observation and reflection in order to understand how the system has responded to the perturbation	No design methods used	-
	3.2 Shift in mindset and posture (and paradigm) from 'fast thinking and designing solutions' to 'long-term thinking'	No design methods used	-

Results show that step 1 and step 2 have a good foundation of design methods and processes. Regarding step 3, the goal has been defined, however, there are no design methods indicated or used in the case-study. For step 1.2, mapping stakeholders' concerns and relations, there are no design methods. Here, methods from other fields are borrowed. Although it is mentioned that these borrowed methods lack a component of action; this did not stop or withhold the process. In step 1.3, it is addressed that backcasting with a big group of stakeholders is highly challenging. However, this phase lacks the tools, methods and processes to support the intentions of the phase, and this is where the project starts to drift. For step 2, the goal and an indication of methods that can be used to reach this goal are defined - but as there is no plan of action made in step 1, it is difficult to situate the interventions in step 2.

Discussion

Results of our search strategy on transition design practices indicate a growing interest in this emerging discipline. Although the increased interest in the design discipline appeared promising, our findings show little evidence to fulfil the promise: only one publication that meets the inclusion criteria, has been found. In other words, only one academic publication has been found that carries out a case-study with real users in order to test proposed frameworks, processes, and tools *developed for transition design*. This might be due to the fact that we deliberately used the phrase “transition design” and “transitions”, which rules out studies from other fields, that using different terminology but might bring relevant contributions to the methodological practices in the transition design field. However, as argued, the current work aims to specifically map practices that have been developed under the flag of transition design. For further research, it would be interesting to include those studies and to evaluate how other disciplines can contribute to the development of the transition design practice.

Furthermore, the framework and approach by Irwin (2018) has been based on principles and consequently, remains rather abstract: until today, only one case study of application has been published. There is no indication found regarding the impact and performance of transition design practice. In the remainder of this section, we elaborate upon how Irwin’s framework and the Systemic Design toolkit can address the limitations of transition design field referring to limitations earlier identified by Ceschin and Gaziulusoy (2016). Although the Systemic Design toolkit did not meet the inclusion criteria, we choose to use it as an example for the synthesis of the transition design practice. The limitations identified by Ceschin and Gaziulusoy (2016) are: on the one hand a too big picture approach, and on the other hand a lack of actionable components. Consequently, ways to address the discrepancy between macro- and micro-innovation are discussed. Based on a synthesis of the transition design framework and approach (Irwin, 2018), and the Systemic Design toolkit, three transition design phases are proposed: *Design Research*, *Designing Interventions* and *Design Practice for Transition*. According to this synthesis, each phase can be linked to one of three limitations earlier mentioned (Ceschin & Gaziulusoy, 2016). The found methods for each phase, referred in the transition design framework and approach (Irwin, 2018) are listed. Based on this overview, each phase is evaluated and suggestions for further research are done. The results of this synthesis can be found in Table 4.

Table 4 Synthesis of the transition design framework and approach (Irwin, 2018) and the Systemic Design Toolkit (2018)

<i>Transition Design Phase</i>	<i>Design Research</i>	<i>Designing Interventions</i>	<i>Design Practice for Transition</i>
<i>Indicated limitations transition design by Ceschin & Gaziulusoy (2016)</i>	<i>Too big picture</i>	<i>Linking macro- and micro innovation</i>	<i>Endorsement</i>
<i>Steps and methods in Framework</i>	1. Reframing present and future - co-creation sessions - visualization - relation-mapping - use of narratives - 1:4: all - backcasting and roadmapping	2. Designing Interventions - locate the spots for design interventions in the system - create multiple interventions at multiple levels over multiple time horizons	3. Waiting and observing
<i>Steps and methods in Toolkit</i>	1. Framing the system - rich context template 2. Listening to the system - actants template 3. Understanding the system - system map template 4. Defining the desired future - value proposition template	5. Exploring possibility space - intervention strategy canvas 6. Designing the Intervention strategy - connectors template - paradox cards 7. Fostering the transition - roadmap for transitions template	
<i>Total</i>	<i>Framing present: sufficient tools and methods</i>	<i>Designing interventions: sufficient methods and tools from other design fields</i>	<i>Monitoring and steering: no methods</i>

Design Research: how to escape time and land in space?

This phase is about researching, structuring and understanding the past, present and future context, and the stakeholders, of the problem. This research phase should lead to new insights that are used to create a vision on how to address this problem. Therefore, we refer this particular phase of a transition design process as Design Research. Both Irwin's framework (2018) and the Systemic Design Toolkit (2018) partly address the apparent limitation, too big picture, for this phase. Both the framework and the toolkit seem to be equipped to create an understanding of the past and current situation and to frame the problem, using design methods; as can be found in Table 4: step 1 in the transition framework, using stakeholder co-creation sessions, visual maps and connecting and structuring in this map. Step 1 to 4 in the Systemic Design Toolkit: using the rich context map, actants, system map, and value proposition. However, both the framework and the toolkit are not equipped with design methods to help users think outside their own paradigm in order to create a novel future vision. There is agreement that the novelty and quality of a shared vision guide and determine the success of innovation processes in business (Pearce and Ensley, 2004). Considering transition design as a large scale, multiple stakeholder, radical innovation trajectory, the novelty and quality of the future vision is crucial. Further research on methods, tools and processes to create future visions are welcome to mature the transition design discipline. Lessons from strategic design and radical innovation can be a first step for further research.

Another limitation found in the *Design Research* phase, is the lack of design methods for the management and leveraging of stakeholders and their interests. Irwin (2018) borrowed methods from other fields (see Table 3, step 1, goal 1.2), and motivate that those methods are useful to gain insight, but they lack a component of action. To understand the involved stakeholders and the discrepancy between their interests, the Systemic Design Toolkit created the 'listening to system' method. It considers the perspectives of the stakeholders on the issue, and it provides a visual tool to show the points of discrepancy between the stakeholders within the situation. Unfortunately, this canvas is made to compare the perspectives of only two stakeholders. Persistent problems have a great variety of stakeholders (Rotmans & Loorbach, 2008), and therefore this canvas is not extensive enough for addressing those problems. A first step to address this limitation might be expand the tool 'listening to system' in such a way it allows for use with multiple stakeholders. Another step could be researching the used methods by Irwin and collages, to see if they can be transformed towards design methods.

Designing Interventions: the right thing, at the right place, at the right time?

The current phase is about moving from vision towards action by creating the right intervention, at the right place, at the right time. In our work, we, therefore, refer to this phase as Designing Interventions. Both the framework and the toolkit propose a method to find the right place and time for the intervention; as can be found in Table 4: step 2 in the framework: locate the spots for design interventions in the system, create multiple interventions at multiple levels over multiple time horizons. Step 7 in the toolkit, roadmap for transitions. To create the right thing, the framework provides a table with other design disciplines that can be used to create interventions; the toolkit developed step 5 (the intervention strategy canvas), and step 6, (the 'connectors' and the 'paradox cards') to design interventions. An interesting observation is that the framework starts this phase by looking into the whole system and the planning of design interventions; the toolkit starts by creating solutions and then continues to planning. Unfortunately, the framework provides little structure or tools to find the right time and the right place, and at the same time, to create the right intervention; or in other words, how to link macro and micro innovation. To link innovations, the toolkit created the roadmap for transitions. This helps to place the interventions in time. However, this canvas is not extensive enough to find the right place, as it does not consider the complexity and different levels of the transition context - or in other words, it is not extensive enough to link macro and micro innovation. For further research into how to link macro and micro innovation, it might be interesting to start with combining the 'locating' of the framework and the 'roadmapping' of the toolkit. It might also be interesting to look into product portfolio management and product development from a strategic design perspective, as they consider careful planning the timing of launching new products, and how the products relate to each other.

For the designing of interventions, step 5 (The 'intervention canvas') of the toolkit provides a good bedrock as it clearly structures the boundaries of the system, and step 6 (the connectors and the paradox cards) are useful probes to further develop and define the interventions. Thereby, it provides sufficient guidance on how to create the right thing. The framework suggests a table with design disciplines that are experienced with the

design of interventions, which should give sufficient guidance in designing interventions, as those design disciplines are matured and capable of creating good designs. A first initiative to further develop this step, might be to create a separate toolkit for the design of transition interventions, including methods from other disciplines.

Design Practice for Transition: from parts to sum

Transitions are understood as long-term, complex, and non-linear processes of systemic change (Mulder & Loorbach, 2018). In other words, by accumulation of small happenings and changes, or planned interventions, a non-linear transition of systemic change is effectuated. If we facilitate and steer this non-linear process, by making the parts, thus the several design interventions into a whole, and so enable an accumulation, design can contribute to the transition. In keeping with the promise of transition design, this can be achieved with the use of design methods. Therefore, we coined this third phase as Design Practice for Transition. As can be seen in Table 4, nor the framework, nor the toolkit propose a structure, method, or tool, to do so. The framework suggests the phase “waiting and observing” without any further elaboration. Clearly, this phase lacks components of action, which is in keeping with the limitations Ceschin and Gaziulusoy (2016) indicated. However, the difference between design interventions and transition design is the ability to tie interventions together towards one goal. Therefore, further research on how to make a sum of the parts is needed. On top of this, it is important to develop ways to measure the effect of design interventions to get insight on their effect, so we steer the non-linear process in the right direction.

For further research on this matter, it seems to be interesting to learn from the lean startup philosophy and principles. “The Lean Startup method teaches you how to drive a startup: how to steer, when to turn, and when to persevere - and grow a business with maximum acceleration” (Ries, 2011). Considering this “learning to drive a start-up” as a non-linear process, which constantly fundamentally changes direction, transition design can be seen as “learning to drive an extremely complex, invisible vehicle”, and can learn from a good start-up drive-lesson.

Conclusions

The current study presented the results of a review study that particularly searched for publications, studies, and other material demonstrating practices of transition design. Based on the search results, an analysis and evaluation of transition design has been presented. This research is limited to the particular field of transition design practice, and rules out the variety and possible contributions from other fields and/or projects that are not written up in an academic literature format. For further research, it is recommended to study a broader spectrum of the academic field, as well as the non-academic field exemplifying a “transition approach”. Nonetheless, the current research resulted in a proposal of a new transition design process consisting of three phases, and provides suggestions on how those phases can be further developed. The first phase, design research, is about researching and framing past, present, and future with the end goal of a deep understanding of the situation and a shared, novel future vision. This phase is equipped with various methods to understand past and present, but thin on methods to envision the future. Further research into how for example strategic design and business develop future visions seems to be promising. Phase two, designing interventions, is about creating the right thing, at the right place, at the right time. For this phase, there are available methods and steps that guide how to do so; however, those methods and steps do not provide sufficient support to link macro- and micro-innovation. For the design of interventions, a great variety of knowledge from other matured design disciplines can be used; but it would be interesting to further research if a *design interventions for transitions toolkit* can be developed. The last phase, Design Practice for Transition, is both the most important phase as the less developed phase of transition design. For further development and maturing of the transition design field, it is of great importance to further research and develop methods for this phase. Learnings from for example the agile philosophy, aiming to guide innovation based on a build-measure-learn approach, might be an interesting starting point for this phase.

In conclusion, there is great relevance and need for transition design in transition studies, as it aims to move from understanding towards *action*. Unfortunately, until date both fields demonstrate little knowledge about the effect and implementation of those new disciplines in practice, and consistently end with a – unfulfilled – promise. To further develop the academic field, the emphasis should lie on testing and developing the frameworks, tools, and methods for transition design as well as measuring and monitoring the effect of this

approach in the real world. Through its implementation, transition design can come to life and move from an inert promise to a discipline that drives action and enables transitioning forward to a sustainable future.

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