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Designers are increasingly tackling complex societal challenges and fostering system transitions. Transitions are long-term, multi-level, multi-phasal system changes involving numerous actors, requiring innovations that develop new relationships within the system. Therefore, the process of designing for transitions requires new ways of bridging system analysis and system synthesis. This paper explores the concepts of 'transition readiness' and 'value conflicts' as valuable indicators to bridge this gap and support designers in fostering system transitions. Synthesizing insights from literature and previous experience, we propose a first step towards an integrative model for mapping a system transition in a way that inspires design. Our model, called the Transition Readiness Profiles, anticipates the dynamics of a system transition and helps identify how and where design can intervene to accelerate the transition. It analyzes the transition at the individual-, organization-, and system level to understand the system dynamics and reveal what organizations can bring forward to foster the transition relative to others. The Profiles capture the relational dimension of a transition by mapping readiness, value conflict, and stakeholder relationships and dependencies.

Keywords: designing for transitions, value conflict, system mapping, transition readiness

Introduction

Complex societal challenges are increasingly the focus of research scholars and practitioners in multiple disciplines—including design. The urgency and relevance of these complex challenges have inspired new areas of design that are positioned between the domains of systems thinking and design, such as systemic design (Ryan, 2014), designX (Norman & Stappers, 2015), and transition design (Irwin, 2015). These new areas have opened discussions about how designers can cope with complex system transitions. However, less emphasis has been on how to actually design for or foster system transitions.

Transitions are complex and non-linear processes of systemic change that occur over a long time, usually over 25-50 years. As further described by Rotmans and colleagues (2001), *"a transition [is] 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" (p.16)*. Although a complete structural transition takes a long time to materialize, partial processes that begin to destabilize the current system can occur suddenly and with significant impacts, such as with radical innovation or behaviour change (e.g., the Coronavirus). Achieving a transition can only be realized through cooperation between innovators with shared strategies and a collective long-term goal that establishes change at all levels of society (Loorbach, 2007, p. 11). The issue of how to promote and govern a transition has received increasing attention in social science (Loorbach, 2007; Markard, Raven, & Truffer, 2012) and design research (De Koning, 2019; Gaziulusoy & Ryan, 2017, 2018)

This paper explores how systems thinking and design practice can foster system transitions. The type of innovation that takes place in a transition is called 'system innovation'. These innovations aim to change the relationship between individuals, organizations, and companies involved in the transition (Rotmans, 2005, p. 11). In this research, we are interested in exploring the concepts 'transition readiness' and 'value conflicts' as anchor points for designing system innovations. We explore these concepts through Transition Readiness Profiles aimed at helping designers understand how or where to intervene in a system to accelerate a transition. With the concept of 'transition readiness' we explore the willingness and state of preparedness of a variety of stakeholders to move in the direction conceptualized in the transition vision, and/or to particularly position themselves in the light of the transition. Transition readiness is relational. We can evaluate an individual organizations' readiness

relative to the transition vision, as well as organizations' readiness relative to one another to understand what each can bring forward to foster the transition. With 'value conflict', we consider a more comprehensive and holistic view of what drives and steers the behaviour of the system from an organization perspective. We consider what innovations can be of value to the system stakeholders while also contributing to their values as individuals, a collective organization, and system actors. Value conflicts are also relational. For example, they can be between an organization and the transition direction, between the short-term and long-term goals, or between consumers and organizations. Fortunately, designers are skilled at overcoming conflicts through integrative thinking, which is powerful in light of transitions. However, anticipating a changing system and identifying potential value conflicts that serve as design input has been of less focus in transition and design research and practice.

Through the development of Transition Readiness Profiles of multiple organisations, we explore the following questions:

- How might system and conflict mapping tools and methods provide conceptual grounding for design practice in system transitions?
- How might Transition Readiness Profiles help us to bridge our understanding of a transition and how and where design has the most potential to intervene?
- How can design relate to the shift from system analysis to system synthesis of a system transition?

Transition Readiness Profiles (TPRs) offer insights in (potential) system dynamics to help designers understand how and where to intervene in a transition. By mapping an organization's readiness for transition, we reveal value conflicts. These value conflicts later serve as input for design innovation. Presently, the Profile consists of analysing an organisation and its relation to the vision[1], at three levels: the individual, the organization, and the system (figure 1).

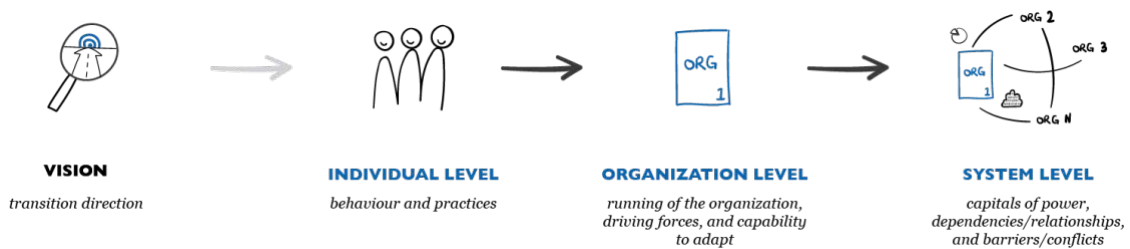| VISION	INDIVIDUAL LEVEL	ORGANIZATION LEVEL	SYSTEM LEVEL
transition direction	behaviour and practices	running of the organization, driving forces, and capability to adapt	capitals of power, dependencies/relationships, and barriers/conflicts

Figure 1. The levels of the Transition Readiness Profile for one organization. This Profile is repeated for multiple organizations.

The Transition Readiness Profile

Reviewing other disciplines as input

The use of TRPs adopts a qualitative approach and primarily analyses the system and synthesizes the information to stimulate idea generation. To develop the TRPs, we began by reviewing various methods from systemic design, conflict and stakeholder theory, and innovative business models (Table 1) to identify how they might inform a design process aimed at mapping a transition. System- and stakeholder-mapping techniques offer strategies to gain an overview of complex system dynamics and stakeholder relationships. Systems thinking scholars and practitioners have proposed numerous ways to map systems, such as through Giga-mapping (Sevaldson, 2011) and Causal-loop diagrams (Hirsch, Levine, & Miller, 2007). Similarly, business scholars propose conflict mapping (Mason & Rychard, 2005) and the power-influence matrix (Eden & Ackerman, 1998) as promising options. When reviewing these tools and methods we reflected upon their potential to provide insight into the readiness of the transition and identify value conflicts.

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[1] **Prior to using the Transition Readiness Profiles it is important to first establish a shared transition vision. Without a clear path for the transition it is difficult to determine how aligned organizations are to the transition path, or where design has the most potential to intervene.**

Table 1. Methods, tools, and frameworks reviewed during the development of the Transition Readiness Profiles.

Field	Tool/Method	Citation	Impression relative to Transition Readiness Profiles
Systemic Design	Giga-Mapping	(Sevaldson, 2011)	- A communication tool which maps many variables to reflect the system and to understand the system components. Very complex, so difficult to use as a way to receive feedback
	Causal-Loop Diagram	(Hirsch et al., 2007)	- Influence of relationships is clearly visualized - Illustrate system-as-is relationship mapping temporal changes may be challenging - Provides an understanding of the system, but lacks 'designability'
Conflict and Stakeholder Analysis	Power-Influence Matrix	(Eden & Ackerman, 1998)	- Classifies stakeholders by power and interest and identifies how actors might be engaged with one another - Anticipates what changes in relationships occur when actors change their power/interest but limited to two variables
	Conflict Map	(Mason & Rychard, 2005)	- Clarifies relationships and power dynamics between actors in the current system - Provides over of conflicts by visualizing types with symbols
	Needs-fear Mapping	(Irwin & Kossoff, 2017; Mason & Rychard, 2005)	- Analyses conflict of single actors and hypothetical responses from other actors in the system-as-is - Compares various actors' attributes and understand to different perceptions
Transition Studies	Multi-level Perspective	(Geels & Schot, 2007; Kemp, 1998)	- Provides analytical lens to understand transitions but remains at an abstract level
	Transition Management Framework	(Loorbach, 2007)	- Provides a structure to what frontrunners are doing in transitions, but remains at an abstract level - Provides a process of facilitating and accelerating towards sustainability transitions
	Multi-Phase Model	(Rotmans et al., 2001)	- Illustrates phases of change in a transition in an abstract way
Organization Innovation	Organizational Identity	(Gilmore & Pine, 2007)	- Determines a business's identity: Essence of enterprise, Nature of offerings, Effects of heritage, Sense of purpose, and Body of values
	Sustainable Business model	(Bocken, Short, Rana, & Evans, 2013)	- Considers changes to the individual organization from its perspective.
	Value Framework; Value Flow Model	(den Ouden, 2012)	- Considers value on multiple levels and perspectives in a way that reflects design skills (focus on value) - Maps system/business model-as-is and uses values as a way to reveal innovation opportunities - Flow model maps numerous elements money, knowledge etc., to assess the system-as-is to reveal possible design opportunities

Description of the Transition Readiness Profiles

The objective of the Transition Readiness Profiles is to explore where there are possibilities to intervene when designing in transitions by anticipating the system dynamics and identifying value conflicts that hinder various organization from entering or moving with the transition. Additionally, it supports understanding what one organization can bring forward to foster the transition relative to others. The key benefit of the TRPs is that it helps designers anticipate future system dynamics and foresee how design may accelerate the transition. Suppose there is a vision for a transition direction, and a designer wants to accelerate the transition by transforming, bypassing or resolving system conflict(s) (Tromp & Hekkert, 2018). The Profiles identify these conflicts by understanding various organizations readiness to transition as conceptualized in the vision. The Profiles reveal which conflicts exist within an organization, and what characteristics of an organization can be strengthened relative to others. Together the Profiles captures the relational element within and between organizations in the system.

Design aspects of the Transition Readiness Profiles include:
- A multi-level analysis to reflect system transitions. It includes the individual- organization-, and system level, as well as implicitly the societal landscape.
- The consideration for the macroscopic and microscopic perspective through identifying value conflicts.
- A probing tool to stimulate designers. The Profiles can be iteratively reflected upon as more information is gathered. There can be multiple variations of the Profiles depending on which characteristics of the system are brought forward.

Individual-level

This level focuses on understanding what practices hinder the transition and what value conflicts are present around the individual (e.g., short-term versus long-term health goals). Identifying practices explains the system as-is, but explored in light of the vision, future practices can be anticipated. For example, if a transition aims to halve food waste by 2030, the designer explores wasteful practices and associated value conflicts. Analysing the transition on the individual level reveals mental models, opportunities for new meaning, and contextualizes an organization's behaviour (e.g., a canned food company increases single-sized portion production because there is an increase in single homeowners).

Questions to consider for this level:
Behaviour and practices
- What consumer practices accelerate and hinder the transition?
- What value conflicts are present around the individual (e.g., between short-term and long-term goals)?
- What is the prominent worldview that accelerates and hinders the transition (e.g., values, beliefs, norms)?
- What states, principles, trends, or developments are accelerating or hindering the transition? What patterns or dynamics in the current system are hindering its change?

Organization-level

The goal of this level is to identify potential barriers for organizations to enter the transition. Drawing from business literature (Eden & Ackerman, 1998; Gilmore & Pine, 2007), we propose that an organization analysis focus on three themes: how the organization runs their business, its driving forces, and its capability to adapt. This level reveals the core of how an organization currently operates, which likely remains stable in the future (e.g., how they innovate now and in the transition). Interpreting an organization in light of the transition vision illuminates how aligned the organization is with the transition direction and possible conflicts/barriers that hinder their transition.

Questions to consider for this level:

Running of the organization
- How is the organization structured? Who are the decision makers?
- What is the organization's operating model? How do they keep the organization running?
- What are the organization's main activities? What do they offer others?

Driving forces
- What is the organization's identity?
- What are their values?
- Why are they operating, what is their purpose and vision?
- What is their history?

Capability to adapt
- What is the organization's innovation capability? How do they innovate?
- What are potential barriers of the organization to move with the transition?
- Does your organization have any relationships with other actors that obstruct or facilitate organizational change?
- Are there barriers that stand out for the organization that need to be overcome for them to transition?

System-level

This level focuses on understanding the dependencies, relationships, and unique qualities of an organization in the transition system. It supports a designer to anticipate what characteristics of organizations, which we refer to as capital(s) of power, can be brought out to accelerate the transition. We focus on mapping capitals of power rather than more common system mapping items like the flow of goods or money to shift the Profiles away from being an assessment tool of the system, towards a way to reveal what can be brought forward in the system by design. Once the system is understood from an organization perspective, designers can creatively leverage an organization's capitals, barriers, and relationships through an innovation.

Currently, we have identified seven capitals of powers that can inspire design innovations:

- *Human Capital:* Organization competencies, creativity, skills, knowledge, and habits of staff.
- *Structural Capital*: Data and information, intellectual property, patents/copyrights, and trade secrets.
- *Relational Capital:* Social networks, alliances, partnerships, formal and informal relationships.
- *Financial Capital:* Debt and equity.
- *Reputational Capital:* Organization perception (e.g., trust, transparency, customer service etc.,).
- *Resource Capital:* Material, land, buildings, and rights of use.
- *Cultural Capital:* National pride and cultural significance.

Questions to consider for this level:

Capitals of power
- What could be the organization's unique quality (e.g., capital) to accelerate the transition?
- What value creating and value adding activities is performed by the organization?

Dependencies and relationships
- What other actors (internal or external to the system) need to be considered for this organization to transition? What are the dependencies/relationships between these and how do they relate to the organization's transition (e.g., consumers)?
- What are the relations between the potential capitals of power?

Barriers and Conflicts
- Which barrier and/or conflict in the system can be leveraged by the organization to accelerate the transition?
- How may design relate to the barriers and conflicts from the organization's perspective?

Discussion

We envision that a selection of stakeholders relevant to the transition each have a Transition Readiness Profile, making visible how ready they are for the transition as well as how they relate to the transition. Taking the Profiles together reveals how the designer can best intervene to accelerate the transition. For example, the designer could focus on an innovation by using an organizations capital that is key to transition the system. Alternatively, they could decide to overcome a barrier that is hindering multiple organizations from transitioning. The Profiles may also be used as a conversation tool allowing clearer feedback from actors with regards to their position in the transition.

Ultimately, we conceive the TRPs as an intermediary step in the transition design process. The Profiles allow the designer to zoom in to each individual organization pertinent to the transition and understand how that organization functions in its system, or zoom out to see how the numerous organizations relate and function in the transition system. Zooming in and out at different levels of the transition whilst focusing on the concepts of 'transition readiness' and 'value conflicts' serves as input and inspiration to bridge system analysis and designing innovations. We continue to reflect upon whether the three levels of individual, organization, and system, and the corresponding questions inspire design and serve as suitable elements to anticipate the changes of a system in light of a transition.

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