ISSN 1668-0227

Cuaderno 73

Año 19
Número 73
Julio
2019

Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos]

Diseño en Perspectiva - Diseño para la transición. Primera Sección

CarnegieMellon Design

Carnegie Mellon University

Centro de Estudios en Diseño y Comunicación.
Facultad de Diseño y Comunicación.
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(*) Esta es una publicación conjunta entre ambas instituciones, denominada **Diseño en perspectiva - Diseño para la transición**, que cuenta con la participación de académicos de la School of Design at Carnegie Mellon, USA y la Facultad de Diseño y Comunicación de la Universidad de Palermo, junto con invitados de otras Universidades, bajo una coordinación compartida. Por motivos prácticos y a efectos organizativos, se ha dispuesto la sección correspondiente al Diseño para la Transición coordinada por Terry Irwin en el Cuaderno nº73, y la sección correspondiente a las Perspectivas del Diseño coordinada por Daniela V. Di Bella, en el Cuaderno nº80. La presente publicación surge de las acciones del Acuerdo de Cooperación Académica celebrado en 2014 entre CMU y UP, donde la Facultad de Diseño y Comunicación, incorporó una nueva línea de exploración, reflexión e investigación a la Maestría en Gestión del Diseño denominada Diseño en Perspectiva, Escenarios del Diseño (Línea de Investigación nº4), vinculada al Programa Diseño para la Transición (**Transition Design**) que esta prestigiosa Universidad desarrolla a nivel de Doctorado y Maestría en Estados Unidos.

Textos en inglés
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1º Edición.
Cantidad de ejemplares: 100
Ciudad Autónoma de Buenos Aires, Argentina.
Julio 2019.

Impresión: Artes Gráficas Buschi S.A.
Ferré 250/52 (C1437FUR)
Ciudad Autónoma de Buenos Aires, Argentina.

ISSN 1668-0227

El Ministerio de Educación, Ciencia y Tecnología de la República Argentina, con la resolución Nº 2385/05 incorporó al Núcleo Básico de Publicaciones Periódicas Científicas y Tecnológicas –en la categoría Ciencias Sociales y Humanidades– la serie Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos]. Facultad de Diseño y Comunicación de la Universidad de Palermo. En diciembre 2013 fue renovada la permanencia en el Núcleo Básico, que se evalúa de manera ininterrumpida desde el 2005. La publicación en sus versiones impresa y en línea han obtenido el Nivel 1 (36 puntos sobre 36).

La publicación Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos] (ISSN 1668-0227) está incluida en el Directorio y Catálogo de Latindex.

La publicación Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos] (ISSN 1668-0227) pertenece a la colección de revistas científicas de SciELO.

La publicación Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos] (ISSN 1668-0227) forma parte de la plataforma de recursos y servicios documentales Dialnet.

La publicación Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos] (ISSN 1668-0227) se encuentra indexada por EBSCO.

Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos] on line
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Cuadernos del Centro de Estudios en Diseño y Comunicación. [Ensayos], es una línea de publicación cuatrimestral del Centro de Estudios en Diseño y Comunicación de la Facultad de Diseño y Comunicación de la Universidad de Palermo. Los Cuadernos reúnen papers e informes de investigación sobre tendencias de la práctica profesional, problemáticas de los medios de comunicación, nuevas tecnologías y enfoques epistemológicos de los campos del Diseño y la Comunicación. Los ensayos son aprobados en el proceso de referato realizado por el Comité de Arbitraje de la publicación.

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Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos] Nº 73
ISSN 1668-0227

Facultad de Diseño y Comunicación.
Universidad de Palermo. Buenos Aires.
Julio 2019.

Sumario
Summary

Diseño en Perspectiva - Diseño para la Transición. Primera Sección
Design in perspective - Transition Design. First Section

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Prólogo de la Primera Sección

Daniela V. Di Bella *

Resumen: La inclusión del Diseño para la Transición (Irwin, Kosoff y Tonkinwise, 2015) propuesto por la Universidad Carnegie Mellon a nivel de posgrado, en la currícula de la Maestría en Gestión del Diseño UP, ha permitido promover una mirada integral y responsable del diseño en nuestros estudiantes, tendiente a preguntarse sobre las prácticas aprendidas y profesionales instaladas en el campo, considerándolo desde una perspectiva sistémica, que revisa sus escenarios contextuales en todas sus dimensiones y capas de incidencia, haciendo foco sobre la relación sostenible entre Sociedad-Economía-Ambiente, desde una valoración reflexiva del diseño y el diseñador como **agente de cambio** que pone en juego los conceptos y desafíos de este nuevo campo del diseño emergente. Con este múltiple desafío se dio inicio en 2014 a la Línea de Investigación Nº4 denominada **Diseño en Perspectiva, Escenarios del Diseño**, siendo esta publicación el testimonio de la culminación de su primer proyecto denominado Perspectivas del Diseño durante 2017. Los beneficios y auspiciosos resultados de su informe de impacto, han posibilitado el comienzo de su segundo Proyecto Visiones del Diseño en 2018.

Palabras clave: Diseño en perspectiva - Escenarios del Diseño - Responsabilidad del Diseño - Futuro del Diseño - Diseño emergente - Diseño para la Transición - Diseño sostenible - transiciones socio-técnicas - investigación en diseño - teoría del diseño.

[Resúmenes en inglés y portugués en páginas 17-18]

(*) Daniela V. Di Bella. Doctoranda nivel Tesis del PhD en Educación Superior de la Facultad de Ciencias Sociales (UP). Arquitecta (FAUM), Magister en Gestión del Diseño (UP). Directora de la Línea de Investigación Nº4 "Diseño en Perspectiva, Escenarios del Diseño" bajo el acuerdo académico con la School of Design at Carnegie Mellon, USA. Profesora de Diseño IV, Maestría en Gestión de Diseño (DCUP) y Parte del Cuerpo Académico del Doctorado en Diseño y la Maestría en Gestión del Diseño. Miembro del Plenario de la Comisión de Posgrado DC. Directora del Departamento de Producción de Diseño y Comunicación de la Universidad de Palermo (CPDC). Creadora y Editora de http://metaespac.hypotheses.org y www.elojosalvaje.com.

Este Prólogo pertenece a la publicación conjunta denominada Diseño en perspectiva - Diseño para la transición, que cuenta con la participación de académicos de la School of Design at Carnegie Mellon, USA y la Facultad de Diseño y Comunicación de la Universidad de Palermo, junto con invitados de otras Universidades, bajo una coordinación compartida. Por motivos prácticos y a efectos organizativos, se ha dispuesto la sección correspondiente al Diseño para la Transición coordinada por Terry Irwin en el Cuaderno nº73, y la sección correspondiente a las Perspectivas del Diseño coordinada por quien escribe, en el Cuaderno nº80.
De este modo el presente volumen (Cuaderno Nº 73) contiene la primera sección de esta publicación conjunta entre ambas instituciones, que se proyecta y completa en la segunda sección publicada en el Cuaderno Nº80. En las páginas 283-288 se encuentran listados en orden alfabético los académicos e invitados participantes por ambas instituciones.

La Facultad de Diseño y Comunicación ha atravesado en las últimas décadas, varias etapas evolutivas, en su proceso de internacionalización donde los acuerdos y alianzas establecidos con las distintas Instituciones Académicas extranjeras –en miras de la sociedad de los próximos 25 años– ya no solo fueron llevados a cabo desde la mirada tradicional relacionada con el intercambio académico de estudiantes, profesores y recursos (movilidad), sino más bien orientados hacia un proceso de cooperación, capacitación y colaboración en red para el desarrollo de proyectos conjuntos vinculados con la *integración de una dimensión internacional dentro de las aulas.*

Actualmente la Facultad de Diseño y Comunicación de la Universidad de Palermo, lidera 14 líneas de Investigación en Diseño, vinculadas con Instituciones Educativas nacionales y extranjeras de primera línea y de todo el mundo. En este sentido, **Diseño en Perspectiva - Diseño para la Transición (*Design in perspective - Transition Design)*** da comienzo a la publicación conjunta entre la Facultad de Diseño y Comunicación de la Universidad de Palermo (Buenos Aires, Argentina - UP) y la School of Design of Carnegie Mellon (CMU - Pittsburgh, EEUU); y se enmarca dentro del Proyecto de Investigación N°4, denominado **Diseño en Perspectiva, Escenarios del Diseño.**

Este Proyecto se gestó en 2014, a partir del Acuerdo de Cooperación Académica celebrado entre ambas Instituciones, donde la ***Facultad de Diseño y Comunicación*** (DCUP) incorporó una nueva línea de exploración, reflexión e investigación a la Maestría en Gestión del Diseño (DCUP), vinculada al Programa Diseño para la Transición (***Transition Design***) que esta prestigiosa Universidad desarrolla a nivel de Doctorado y Maestría en Estados Unidos. La inclusión del Diseño para la Transición (Irwin, Kosoff y Tonkinwise, 2015) propuesto por la Universidad Carnegie Mellon a nivel de posgrado, en la currícula de la Maestría en Gestión del Diseño UP, ha permitido promover una mirada integral y responsable del diseño en nuestros estudiantes, tendiente a preguntarse sobre las prácticas aprendidas y profesionales instaladas en el campo, considerándolo desde una perspectiva sistémica, que revisa sus escenarios contextuales en todas sus dimensiones y capas de incidencia, haciendo foco sobre la relación sostenible entre Sociedad-Economía-Ambiente, desde una valoración reflexiva del diseño y el diseñador como **agente de cambio** que pone en juego los conceptos y desafíos de este nuevo campo emergente del diseño.

Según expresa Terry Irwin en el prefacio de su sección, el Diseño para la Transición es un área nueva de investigación, estudio y práctica, cuyos dos objetivos principales son: *(a) desarrollar nuevas herramientas y enfoques dirigidos por el diseño, que puedan ayudar*

a equipos transdisciplinarios que trabajan en proyectos relacionados con la transición; y (b) educar a las nuevas generaciones de diseñadores que estarán calificados para colaborar en estos equipos. El Diseño para la Transición, reconoce que vivimos en "tiempos de transición" y considera la necesidad de anticiparse y planificar escenarios a largo plazo que promuevan transiciones sociales hacia futuros más sostenibles, donde el diseño y los diseñadores se constituyen en un ***agente de cambio***. Las ideas relacionadas con el concepto de *transición*, y de las *sociedades en transición*, representan un marco pluri-ideológico que instala un espacio del debate y cuestionamiento vinculado con la gestación de una transformación cultural, que atañe no solo a las conceptualizaciones, posturas y definiciones aprendidas del campo del diseño, sino a la cosmogonía global que rige el ordenamiento y estructuración política, social y económica de los últimos 200 años. Considerando estos aspectos, la línea de investigación **Diseño en Perspectiva, Escenarios del Diseño** pretende (1) Fortalecer las capacidades para la investigación en Diseño; (2) Actualizar el campo disciplinar y ejercicio profesional del diseño en la gestión; (3) Crear y participar de redes de actores y conocimiento; (4) Cooperar con los desafíos que contribuyen con la transformación social sostenible; e (5) Internacionalizar a los actores que colaboran (personas y/o instituciones).

Tal como se viene expresando, este proyecto surgido de los diálogos mantenidos desde Julio de 2014 y de manera periódica con Terry Irwin, en relación con la presente línea de investigación, avanzó también sobre la idea de compartir la responsabilidad de la publicación conjunta, con la participación de académicos de ambas instituciones e invitados, bajo una coordinación compartida. De este modo por motivos prácticos y, a efectos organizativos, se ha dispuesto la sección correspondiente al **Diseño para la Transición** coordinada por Terry Irwin en el Cuaderno 73, y la sección correspondiente a las **Perspectivas del Diseño** (primer proyecto de la Línea de Investigación Nº4) en el Cuaderno 80.

La sección coordinada por Terry Irwin (CMU) contenida en el Cuaderno 73 se titula **Diseño para la Transición** *(Transition Design)*[1], y contiene un trabajo de investigación inestimable, cuyos académicos y contenidos inauguran, explican y desarrollan de manera minuciosa y profusamente fundamentada, una plataforma consistente y actualizada de estudio, análisis y gestión, sobre una nueva área de conocimiento emergente de Diseño. Según se describe en su Prefacio, contiene 13 artículos de 19 autores, profesionales, investigadores y educadores provenientes de Estados Unidos, Europa y Oceanía, y que representan a las disciplinas del diseño, la ecología social, el cine, el periodismo, la filosofía, la arquitectura y los estudios de prospectiva, entre otras, organizados de acuerdo a las cuatro categorías del modelo heurístico del Diseño para la Transición. Estas categorías son: (a) la visión, (b) las teorías del cambio, (c) la mentalidad y la postura, y (d) las nuevas formas de diseño, que constituyen el marco *(framework)* que define las cuatro áreas de conocimiento, acción y autorreflexión, que relacionadas entre sí, implican según Escobar "*un área de investigación, educación y práctica del diseño comprometida con el cambio social radical ante la insostenibilidad estructural (la que) puede ser vista como su intervención más valiente y proactiva, no sólo en el campo del diseño sino, también, dentro de la academia como un todo.*" (Escobar, 2016, p. 176)

Del mismo modo la sección coordinada por Daniela V. Di Bella (UP) contenida en el Cuaderno 80 se titula **Diseño en Perspectiva**[2], y posee 11 artículos de 12 autores, profe-

sionales, investigadores y educadores provenientes de Latinoamérica, que representan a las disciplinas del diseño, la arquitectura, el urbanismo, el arte, la multimedia, la visión de la industria, los negocios, el emprendedorismo, entre otros organizados de acuerdo a 4 categorías temáticas que cubren algunos de los escenarios contemporáneos del diseño en la región relacionados con (a) reflexiones sobre diseño, (b) diseño sustentable, (c) transición hacia la sostenibilidad y (d) diseño para la transición. El apartado ***(d) Diseño para la Transición***, contiene **un informe de impacto retrospectivo y continuo**, de la implementación del Primer Proyecto de la Línea de Investigación Nº4 denominado Perspectivas del Diseño, que analiza el período 2014_2 al 2016_2 inclusive, correspondiente con 5 comisiones consecutivas de la asignatura Diseño IV de la Maestría en Gestión del Diseño, en la que se viene desarrollando el proyecto. En este informe se incluyen también resúmenes, gráficos y comentarios de las 24 ponencias de estudiantes, seleccionadas y presentadas en el marco de la Línea de Investigación durante el Congreso Latinoamericano de Enseñanza del Diseño 2015-2016 y Coloquio de Investigación y Desarrollo en Diseño Latino 2016-2017, junto con un recorrido comentado del trabajo junto a los 85 estudiantes latinoamericanos que integraron el recorte temporal en estudio.

Esta publicación conjunta dispuesta en dos secciones (Cuadernos 73 y 80), presenta y representa la culminación de las acciones de colaboración académica del primer Proyecto (2014-2017) denominado **Perspectivas del Diseño** (Línea de Investigación Nº4: Diseño en Perspectiva, Escenarios del Diseño). Los beneficios y auspiciosos resultados de su informe de impacto han posibilitado el comienzo de su segundo Proyecto en 2018, denominado Visiones del Diseño.

Visiones del Diseño iniciado en 2018 continúa con la exploración, reflexión e investigación vinculada al Programa Diseño para la Transición (***Transition Design - CMU***), dentro de la Maestría en Gestión del Diseño (DCUP), y que esta prestigiosa Universidad desarrolla a nivel de Doctorado y Maestría en Estados Unidos, como con sus acciones de publicación conjunta y de dirección compartida. Este segundo proyecto que pertenece a la misma Línea de Investigación, además pretende indagar sobre los panoramas diagnósticos y/o propositivos que se mueven dentro de las principales problemáticas del campo proyectual y disciplinar, relacionados con las demandas a las que se enfrenta el diseño en la contemporaneidad. Junto con el debate y estudio de estos panoramas se ensayará el planteo de posibles propuestas e ideas, que argumenten potenciales vías superadoras o visiones hacia la solución.

Para dar cierre a este prólogo, quiero agradecer muy especialmente a mi Co-Editora, Terry Irwin, al equipo de profesionales y académicos destacados de la Universidad Carnegie Mellon, y así también a todos los que han participado como académicos invitados, en mi nombre y de la Institución a la que represento, por brindarnos a mí, a mis estudiantes de maestría y a la comunidad académica toda, la oportunidad y generosidad de conocer e indagar sobre de este campo emergente del Diseño. Cabe destacar que en estos casi 4 años de intensa labor que he mantenido, junto a Terry Irwin y su equipo de académicos, he recibido como Directora de esta Línea de Investigación, un apoyo inestimable y consistente en documentación actualizada, artículos de investigación, apoyatura metodológica y seguimiento permanente sobre el Diseño para la Transición, pero sobre todo un frondoso intercambio humano que me permite expresar de manera muy personal mi más profundo agradecimiento.

Notas

1. Los artículos de la Sección Diseño para la Transición (Transition Design) se han recepcionado en el idioma de origen de la región (inglés).
2. Los artículos de la Sección Diseño en perspectiva se han solicitado en idioma de origen de la región (castellano). Aunque siendo esta una publicación bilingüe (inglés-castellano), y siendo el inglés una lengua de opción por dominio profesional preferida al castellano para los autores de Brasil (que son de habla portuguesa), se les ha facilitado entregar sus colaboraciones escritas en inglés.

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Irwin, T.; Tonkinwise, C.; Kossoff, G. (2015). *Transition design: An educational framework for advancing the study and design of sustainable transitions*. Paper presented at the Sustainability Transitions Research Network Conference, Brighton, United Kingdom.
Irwin, T. (2015). Transition design: A proposal for a new area of design practice, study and research. *Design and Culture Journal*, 7(2), 229-246. DOI:10.1080/17547075.2015.1051829

Abstract: The inclusion of Transition Design (Irwin, Kosoff and Tonkinwise, 2015) proposed by School of Design of Carnegie Mellon University (CMU) at the postgraduate level, in the curricula of the Master in Design Management (UP), has allowed to promote an integral and responsible view of the design in our students. This view are tending to wonder about the practices learned and installed in the field, considering it from a systemic perspective, which reviews its contextual scenarios in all its dimensions and layers of incidence, focusing on the sustainable relationship between Society-Economy-Environment, from a reflexive assessment of design and the designer as an **agent of change** that brings into play the concepts and challenges of this new field of emerging design. With this multiple challenge began in 2014, the research Line No. 4 called **Design in Perspective, Design Scenarios**, this publication being the testimony of the culmination of its first project called Perspectives of Design during 2017. The benefits and auspicious results of its impact report, have made possible the start of its second stage called Design Visions Project in 2018.

Key words: Design in perspective - Design Scenarios - Design Responsibility - Future of Design - Emerging Design - Transition Design - Sustainable Design - socio-technical transitions - design research - design theory.

Resumo: A inclusão do Design para a Transição (Irwin, Kosoff y Tonkinwise, 2015) proposto pela Universidade Carnegie Mellon no nível de pós-graduação no currículo da Ma-

estria em Gestão do Design da Universidade de Palermo, permitiu promover uma mirada integral e responsável do design nos estudantes, tendente a perguntar-se sobre as práticas aprendidas e profissionais instaladas no campo, considerando-o desde uma perspectiva sistémica, que revisa seus cenários contextuais em todas suas dimensões e estratos de incidência, fazendo foco sobre a relação sustentável entre Sociedade-economia-ambiente, desde uma valoração reflexiva do design e o designer como agente de cambio que apresenta os conceitos e desafios deste novo campo do design emergente. Com este múltiplo desafio iniciou-se no ano 2014 a Linha de Pesquisa N°4 chamada Design em Perspectiva, Cenários do Design, e este Caderno é testemunha da culminação do seu primeiro projeto denominado Perspectivas do Design durante 2017. Os benefícios e resultados auspiciosos do informe de impacto, possibilitaram o começo do segundo Projeto Visões do Design durante 2018.

Palavras chave: Design em perspectiva - Cenários do Design - Responsabilidade do Designer - Futuro do Design - Design emergente - Design para a Transição - Design sustentável - transições sócio-técnicas - pesquisa em design - teoria do design.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Preface

Terry Irwin *

Abstract: Fundamental change at every level of our society is needed to address the issues confronting us in the 21st century. Climate change, loss of biodiversity, forced migration, depletion of natural resources, and the widening gap between the rich and the poor are just a few of the "wicked problems" that require new approaches to problem solving. Transition Design or "design for transition" brings together two powerful memes: (a) the idea that entire societies will need to transition toward sustainable futures, and (b) the realization that this will involve systems-level change informed by a deep understanding of the anatomy and dynamics of complex systems. This emerging field of "transition studies" now encompasses a community of international researchers from the areas of social and management sciences, engineering, activism, and related disciplines. However, contributions from the field of design and its related sub-disciplines are still relatively rare, and Transition Design seeks to address this gap. This is surprising given the degree to which design permeates socio-technical systems and is implicated in most of the wicked problems previously mentioned. This ubiquity, along with the evolution of design in recent decades to become a highly integrative discipline, positions design and designers as potentially powerful leverage points for positive systems-level change.

Key words: Transition Design - sustainable design - socio-technical transitions - transition studies, - transition towns - design theory.

[Abstracts in spanish and portuguese at pages 25-26]

(*) Terry Irwin is a Professor and Head of The School of Design at Carnegie Mellon University. She has been a design practitioner for more than 40 years and was a founding partner of the international design firm MetaDesign. Her research focus is in Transition Design and how principles from living systems and Goethe's approach to understanding natural phenomena can inform more responsible and sustainable design approaches. tirwin@andrew.cmu.edu

Fundamental change at every level of our society is needed to address the issues confronting us in the 21st century. Climate change, loss of biodiversity, forced migration, depletion of natural resources, and the widening gap between the rich and the poor are just a few of the "wicked problems" that require new approaches to problem solving. Transition Design

or "design for transition" brings together two powerful memes: (a) the idea that entire societies will need to transition toward sustainable futures, and (b) the realization that this will involve systems-level change informed by a deep understanding of the anatomy and dynamics of complex systems.

Our societies are *always* in a constant state of transition. However, these transitions are largely unintentional and full of "drift," and we only understand their implications in hindsight –we call this history. The question that Transition Design and many other transition-related movements ask is as follows: "Can we intentionally direct societal transitions toward more sustainable futures?" Groups, such as the Great Transition Initiative, The Socio-Technical Research Network, The Transition Town Network, Commons Transitions, and Just Transitions, and systems-related initiatives, such as the Forum for the Future's School of System Change and The Next System Project, are all contributing to the growing body of knowledge about societal transitions and systems-level change. At the same time, many fields and disciplines, such as foresight studies and futuring, policy design, stakeholder conflict studies, and methodologies, such as social practice theory and design for behavior change, are deepening our understanding of wicked problems, socio-technical system "entrenchment", and the process of envisioning long-term futures that societies want to transition toward.

This emerging field of "transition studies" now encompasses a community of international researchers from the areas of social and management sciences, engineering, activism, and related disciplines. However, contributions from the field of design and its related sub-disciplines are still relatively rare, and Transition Design seeks to address this gap. This is surprising given the degree to which design permeates socio-technical systems and is implicated in most of the wicked problems previously mentioned. This ubiquity, along with the evolution of design in recent decades to become a highly integrative discipline, positions design and designers as potentially powerful leverage points for positive systems-level change.

Origins of Transition Design

The term "Transition Design" was first used in 2005 by activist Louise Rooney as the name of a not-for profit company connected to the first transition town initiative in Kinsale, Ireland (Hopkins, 2006; Rooney, 2006; Southern Star Staff, 2006). In 2008, two papers delivered by Boehnert and Kossoff at the "Changing the Change" conference in Turin, Italy connected the concept of societal transitions to the field of design: Transition town activist and designer Joanna Boehnert (2008) asked "What designers can learn from the Transition Movement," whereas social ecologist and design researcher Gideon Kossoff proposed a holistic framework to aid in the designed transition toward a more sustainable society (Kossoff, 2008). In 2009, Boehnert launched the "Design Transition" website to introduce ecoliteracy into design education.

Between 2010 and 2012, several PhDs linked transition-related initiatives and theories to the field of design. For instance, Idil Gaziulusoy (2010), Peter Joore (2010), and Fabrizio Ceschin (2012) argued for the integration of systems design with socio-technical transition theory (Ceschin, 2012; Gaziulusoy, 2010; Joore, 2010). In 2011, the book *Grow Small,*

Think Beautiful, edited by Harding, contained two chapters (by Irwin and Kossoff, respectively) that proposed Transition Design as a new area of design focus: Irwin proposed Transition Design as an approach to address complex wicked problems, whereas Kossoff synopsized his 2011 doctoral thesis in a chapter calling for the integration of radical social theory and contemporary holism (Kossoff, 2011a; Kossoff, 2011b).
In 2013, Irwin, Tonkinwise, and Kossoff developed the Transition Design framework and proposed it as an area of design focus within the newly designed curricula at Carnegie Mellon's School of Design. This project became the basis for several subsequent papers, two of which were presented at the Socio-technical Transitions Network conference in 2015 (Irwin, 2015; Irwin, Tonkinwise, & Kossoff, 2015; Kossoff, Tonkinwise, & Irwin, 2015).
Three Transition Design symposia have been held –in Pittsburgh in 2015, in Dartington, UK in 2016, and in Barcelona, Spain in 2017. The proceedings of the 2015 symposium were published as a Design Philosophy Papers monograph, which included papers by Cameron Tonkinwise, Ezio Manzini, Arturo Escobar, and Damian White, among others (Kossoff, Irwin, & Willis, 2015). The proceedings from the 2016 symposium are forthcoming in spring of 2018 and will include papers from people in the fields of activism, economics, theatre, and psychology, such as Andrew Simms, Tony Greenham, Robin Murray and Julie Richardson, Lucy Neal, and Tom Crompton.

Objectives of Transition Design

As an emerging area of research, study, and practice, Transition Design has two primary objectives: (a) to develop new, design-led tools and approaches that can aid transdisciplinary teams working on transition-related projects and initiatives; and (b) to educate new generations of designers who will be qualified to collaborate on these teams. It acknowledges that we are living in "transitional times," and takes the need for societal transitions to more sustainable futures as a central premise. It argues that design has a key role to play in these transitions and that it applies an understanding of the interconnectedness of social, economic, political, and natural systems to address problems at all levels of spatio-temporal scales in ways that improve the quality of life. Transition Design advocates the reconception of entire lifestyles, with the aim of making them more place based, convivial, and participatory, as well as harmonizing them with the natural environment.
The transition to sustainable futures calls for new ways of designing that are based on a deep understanding of how to design for change and transition within complex systems. This knowledge and the new skillsets it will inform must be integrated from areas outside design, such as science, philosophy, psychology, social science, anthropology, and the humanities. This will therefore challenge existing design and design education paradigms.

Contributions in this Volume

The Transition Design framework is a fluid, evolving body of knowledge and practices that are useful in seeding and catalyzing transitions toward more sustainable futures. The

framework outlines four mutually reinforcing and co-evolving areas of knowledge, action, and self-reflection: (a) vision, (b) theories of change, (c) mindset and posture, and (d) new ways of designing. These four categories provide an organizing structure for the 13 articles included in the volume (See Figure 1). The 19 contributing authors are practitioners, researchers, and educators from six countries representing the disciplines of design, social ecology, film, journalism, philosophy, architecture, and foresight studies, and they offer important perspectives on the topic of designing for transition and systems-level change.

Vision. Kossoff, Lockton, and Candy all discuss the important role that long-term visioning plays in societal transitions. Lockton and Candy explore the role of visioning for transitions and, drawing from a variety of fields, offer a "visioning vocabulary" of elements. Kossoff looks specifically at cosmopolitan localism as a transition strategy that calls for the reconception of entire lifestyles to be more place based and local, yet cosmopolitan in their global awareness and exchange of information and technology.

Theories of change. Gaziulusoy provides an important survey of the landscape, discusses the emergence of Transition Design/design for transition and its origins, and reflects upon current practices, whereas Tonkinwise contrasts Transition Design with previous attempts to position design as a catalyst for systems-level change. Mulder, Jaskiewicz, and Morelli explore recent paradigm shifts that have the potential to seed change within societal systems and look specifically at how open data can become a new type of "commons" and how hackathons can support digital citizenship. They further reflect upon the role of Transition Design in building social capacity and establishing a new social infrastructure.

Mindset and posture. Both Scupelli and Boehnert contribute articles that address a crucial facet of Transition Design –the need for practitioners and researchers to examine their own value sets and postures of collaboration. Scupelli discusses how these important principles must be taught in the classroom (providing strong connections to Rohrbach and Steenson's articles) with course content focusing on topics related to *ethos* and the way in which it contributes to systems-level change. Boehnert argues for ecological literacy as the basis for a Transition Design approach and discusses the "limitations of philosophical traditions that discount, dismiss, or even deny the importance of life-sustaining processes that enable human existence". Her paper supports the Transition Design premise that new ways of designing must be underpinned by a more holistic and ecological worldview.

New ways of designing. In this section, Irwin, Costa Gomez, Hamilton, and Dahle all look at how the emerging practice of Transition Design engages with projects in the field. Irwin's article reports on a project in Ojai, California to frame water shortage in the community as a Transition Design problem. She discusses the emerging Transition Design approach by resisting the idea of a prescriptive process and arguing in favor of a framework or "palette of practices" that can be configured in situation- and place-specific ways. Costa analyzes a series of projects based in Barcelona and the surrounding region of Catalonia through the lens of the Transition Design framework and provides an important alternative cultural perspective. Building on Irwin's essay, Hamilton provides another perspective on the Ojai,

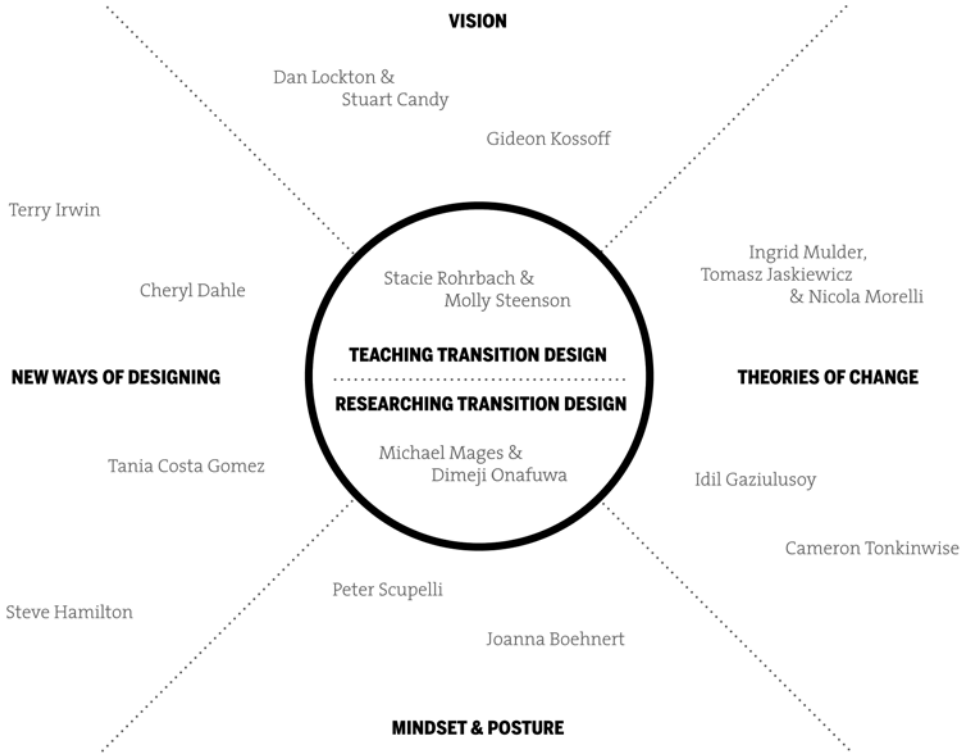

Figure 1.

California project by focusing on the social dynamics inherent within a wicked problem, such as water shortage in a community. Dahle concludes the section with a report on her 10-year process of applying Transition Design principles to the wicked problem of global overfishing. She specifically focuses on the "messiness" of stakeholder collaboration and provides insights into cultivating what she refers to as system leadership.

Teaching and researching Transition Design. Rohrbach and Steenson argue that teaching Transition Design at the higher education level is integral to its development and report on coursework at both the undergraduate and master's levels. Finally, Mages and Onafuwa discuss the challenges of conducting research whose objective is social, cultural, and psychological change. Their paper discusses several approaches undertaken within the doctoral program at Carnegie Mellon's School of Design and their inherent challenges.

Transition Design is still a nascent area of design focus, but international interest among educators, researchers, and practitioners is growing. Carnegie Mellon University, USA; University of Palermo, Argentina; Royal Melbourne Institute of Technology and University of New South Wales, Australia; and Schumacher College/Plymouth University, UK, have all integrated Transition Design into their research strands and/or coursework. Workshops on Transition Design have been held at Schumacher College, UK; the University of the Balearic Islands, Spain; Monterrey Technical University, Mexico; and The Bauhaus, Germany. In 2016, the University of Trondheim, Norway, created a professorship in Transition Design. As noted earlier, three symposia have been held, and a fourth one is planned at Dartington, UK in June 2018.

In order for Transition Design/design for transition to fulfill its objective, additional voices from diverse cultural perspectives must be integrated into the conversation and ongoing research. This edition of Cuadernos represents a collaboration between Carnegie Mellon University, Pittsburgh, USA, and the University of Palermo, Buenos Aires, Argentina. I want to thank my co-editor, Daniela Di Bella and the University of Palermo for giving me and my fellow contributors the opportunity to participate in this project. This volume on Transition Design is presented as a progress report and an invitation for feedback, critique, and collaboration.

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Resumen: Se necesita un cambio fundamental en todos los niveles de nuestra sociedad para abordar los problemas que enfrentamos en el siglo XXI. El cambio climático, la pérdida de biodiversidad, la migración forzada, el agotamiento de los recursos naturales y la creciente brecha entre los ricos y los pobres son solo algunos de los "problemas perversos" que requieren nuevos enfoques para la resolución de problemas. El diseño de transición o "diseño para la transición" reúne dos memes poderosos: (a) la idea de que todas las sociedades necesitarán una transición hacia un futuro sostenible, y (b) la comprensión de que esto implicará un cambio a nivel del sistema informado por un profundo conocimiento de la anatomía y dinámica de los sistemas complejos.

Este campo emergente de "estudios de transición" ahora abarca una comunidad de investigadores internacionales de las áreas de ciencias sociales y administrativas, ingeniería, activismo y disciplinas relacionadas. Sin embargo, las contribuciones del campo del

diseño y sus subdisciplinas relacionadas todavía son relativamente raras, y el diseño de transición busca abordar esta brecha. Esto es sorprendente dado el grado en que el diseño impregna los sistemas socio-técnicos y está implicado en la mayoría de los problemas perversos mencionados anteriormente. Esta ubicuidad, junto con la evolución del diseño en las últimas décadas para convertirse en una disciplina altamente integradora, posiciona al diseño y los diseñadores como puntos de apalancamiento potencialmente potentes para un cambio positivo en el nivel de los sistemas.

Palabras clave: Diseño para la transición diseño sostenible transiciones socio-técnicas - estudios sobre la transición - ciudades en transición - teoría del diseño.

Resumo: É necessária uma mudança em todos os níveis de nossa sociedade para enfrentar os problemas do século XXI. A mudança climática, a perda de biodiversidade, a migração forçada, o esgotamento dos recursos naturais e o crescente fosso entre ricos e pobres são só alguns problemas perversos que requerem novos enfoques para a resolução de problemas. O design de transição ou design para a transição reúne dois conceitos poderosos: a) a ideia de que todas as sociedades necessitarão uma transição até um futuro sustentável, e b) a compreensão de que isto implicará uma mudança ao nível do sistema informado por um profundo conhecimento da anatomia e dinâmica dos sistemas complexos.
Este campo emergente de estudos de transição abarca agora uma comunidade de pesquisadores internacionais das áreas de ciências sociais e administrativas, engenharia, ativismo e disciplinas relacionadas. Entretanto, as contribuições do campo do design e suas subdisciplinas relacionadas são ainda relativamente excepcionais, e o design de transição procura abordar este fosso. Isto é surpreendente pelo grau em que o design impregna os sistemas sócio técnicos e está presente na maioria dos problemas perversos mencionados. Esta ubiquidade, junto com a evolução do design nas últimas décadas para se converter numa disciplina altamente integradora, posiciona ao design e aos designers como pontos de alavancagem potencialmente potentes para uma mudança positiva no nível dos sistemas.

Palavras chave: design para a transição - design sustentável - transições sócio técnicas - estudos sobre a transição - cidades em transição - teoria do design.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

A Vocabulary for Visions in Designing for Transitions

Dan Lockton * and Stuart Candy **

Abstract: "Visions of sustainable futures" have been proposed as a key component of Transition Design, "a means through which contemporary lifestyles and design interventions can be assessed and critiqued against a desired future state" (Irwin et al, 2015a, p. 8). Such ambitions are necessarily wide-ranging, and call for drawing together strands on design and speculation from diverse sources. Here we seek to add to the momentum by exploring a set of concepts relating particularly to this role of vision in designing for transitions. Building on perspectives and projects from other fields, we present elements of a visionary vocabulary, covering different scales and degrees of remove from the present, and situating these terms in relation to specific challenges and opportunities for transition thinking and practice.

Keywords: futures - imaginaries - visioning -transition - design.

[Abstracts in spanish and portuguese at page 49]

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Introduction

Among the proposed elements of Transition Design, "visions of sustainable futures" feature centrally, in order that "contemporary lifestyles and design interventions can be assessed and critiqued against a desired future state" (Irwin, Kossoff, Tonkinwise, Scupelli, 2015a, p. 8). The big-picture ambitions of such an agenda point to a need for exploring and synthesising approaches from practitioners and researchers in other fields whose work deals with questions of vision, futures, and how they relate to the present.

In this piece we seek to explore a set of concepts relating particularly to this role of vision in designing for transitions. In preliminary fashion we build on perspectives and projects from other fields, and aim to situate them in relation to challenges and opportunities for transition thinking and practice. Some have been noted in Transition Design literature before, while others have not, but all are established concepts rather than new coinages, and this is deliberate. Our purpose is to identify and borrow from existing practice some potentially useful heuristics, moves, philosophical prods, or (to introduce our chosen metaphor on this occasion) *lenses* that seem to offer promise to those keen to engage in design with transitional agendas in view. Assembled here, then, are seven ways of seeing, for tackling the 'visionary' aspect of designing for transitions. The seven are: *lenses* themselves; *imaginaries*; *backcasting*; *dark matter*; *circularity*; *experiential futures*; and *new metaphors*. What follows describes each lens and explains its relevance to the emerging practice as we currently see it.

Lenses

This first set of lenses overall draws inspiration from a number of works that have sought somehow to expand the vocabulary of concepts or repertoire of gambits –the metaphors in use vary– readily available in one domain or another. The architect Alexander and colleagues' classic *A Pattern Language* (1977) is one such; designer Hill's more recent *Dark Matter and Trojan Horses* (2012) is another. Musician Eno and artist Schmidt's *Oblique Strategies* cards (1975) hover generatively in the background; likewise the *Group Works* card deck created by the Group Pattern Language Project (2011), a deck collecting concepts and moves for facilitation; and theatre director Boal's *Games for Actors and Non-actors* (2002). Games maker Schell's *The Art of Game Design: A Book of Lenses* (2008), another member of this extended family, is a helpful reference even if we are not necessarily using his focal term in quite the same way. Designers Lockton, Harrison and Stanton (2013) discuss a variety of pattern-like formats for design tools, arriving at 'lenses' as a metaphor for different worldviews of human behavior in the *Design with Intent Toolkit* (2010). Our own use of 'lens' here is probably a bit closer to the spirit of philosopher Dennett's inventory of "handy prosthetic imagination-extenders and focus-holders", in *Intuition Pumps and Other Tools for Thinking* (2013, p. 2). And one final model to mention, psychologist De Bono's *Wordpower* (1977, p. 4) collects a range of terms with the popular expansion of systems literacy in mind:

> [A]n understanding of dynamic and interactive systems means a whole new way of looking at *processes* rather than just at *things*. For this purpose we are only now beginning to build an adequate vocabulary. When we have built this vocabulary and assimilated the related concepts our understanding of the world around will be much improved. This I see as the next quantum step in our cultural development.

We do not pretend that these fragments contain anything as impressive as their sources of inspiration, or that the small starter set gathered here is necessarily part of an impending 'quantum step in cultural development'. However, we are interested in contributing to the reservoir of available approaches to the worthy, ambitious forms of emerging practice outlined in Transition Design literature to date (Kossoff, et al, 2015). The promise of usefulness for guiding an aspiring transitioner's attention and action in the area of vision has served as the main basis for selecting these lenses.

And the first lens to highlight is that of lenses themselves. The various works cited above all seem to manifest a similar impulse –a kind of modular, tactical, pragmatic, creative, open-minded collector's approach to gathering and indexing elements of intellectual, operational and artistic usefulness. Many fields of course have their own master term for such collections: the 'playbook' in certain sports; cookbook; songbook; encyclopedia. The term 'score' as an organizing category is perhaps best known in connection with music, but in the hands of landscape architect Halprin (1970) extends to many other activities. Unsurprisingly perhaps, the area of language offers many organizing frames (and there's another metaphor) at different levels, including 'language' itself, library, vocabulary, dictionary, grammar, and alphabet. One of the most fruitfully catalytic organizing concepts for modular collections of knowledge parlays the component 'pattern' (fashion) into a designerly aggregate, 'pattern language', first elaborated in architecture (Alexander, et al., 1977), and since widely taken up in software development (Gamma, et al., 1994) and interaction design (Tidwell, 2005; Fincher, 2012).

All of the above are alternative metaphors carrying different entailments (see New Metaphors) and, admittedly, considerable potential for self-referential confusion. We have chosen 'lenses' as a deliberate extension of the 'vision' metaphor and a central challenge contained in designing for transition: imagining and catalyzing a (presumably) radically different systemic state. New ways of doing and seeing go hand in hand; the latter are perhaps marginally easier to write about, but we try to blur that boundary wherever possible.

Why have we included this?

Designing for transitions is ambitious. It is inherently multiscalar and inter- if not fully transdisciplinary. Its would-be practitioners need ways of sharing what they are doing, what seems to work, and at this stage the appropriate thinking and learning tools are bound to be modular and piecemeal rather than all-encompassing. We suggest that this notion of patterns or lenses –the modular collection and deployment of approaches to examining, thinking about, and acting in various situations– itself harbours potential as part of the development of Transition Design practice.

*Related: heuristic, **new metaphors**, pattern language, playbook, score*

Imaginaries

Mindset has been named a core component of Transition Design (Irwin, et al., 2015b), primarily expressed through the idea that "openness, mindfulness, and self-reflection" are crucial when designing with transition in view. In addition to these attitudinal aspects, another level at which mindset considerations and ways of thinking can be explored, particularly in the context of visioning, is found in the notion of *imaginaries*. Here we argue that, as a lens, tuning into and investigating the 'imaginary', with regard both to current situations and to possible futures, promises invaluable insights for visioning.

What are imaginaries? The very broad sense in which we use the term here includes: societal-level conceptions (Appadurai, 1990) or (at least partly) shared visions of issues such as climate change, health, immigration, identity, law, or even countries themselves (Anderson, 1983); myths and beliefs which can motivate collaboration (Harari, 2014); or sociotechnical narratives about how certain types of technological development could affect the way we live (Jasanoff, Kim, 2015); along with more individual or small-group scale notions perhaps more familiar to interaction designers, such as mental models (e.g. Revell, Stanton, 2017; Jones, et al., 2011), mental imagery, associations, metaphors (see New metaphors), and so on. There is an argument that imaginaries of futures can affect people's actions in the present (Lanzeni, 2016; Jasanoff, Kim, 2015), and the related concept of a culture's 'images of the future', developed by sociologist Polak in the 1950s, proposes precisely this (1973 [1955], p. 19):

> Any student of the rise and fall of cultures cannot fail to be impressed by the role played in this historical succession of the future. The rise and fall of images of the future precedes or accompanies the rise and fall of cultures. As long as a society's image is positive and flourishing, the flower of culture is in full bloom. Once the image begins to decay and lose its vitality, however, the culture does not long survive.

This may be said to represent a kind of self-fulfillingness (see Circularity), but imaginaries do not emerge independently: those that we have are constructed, over the courses of our lives, through both our social and experiential contexts. They are not permanent, but they are often persistent.

Design –and arts more broadly– can be seen as a form of language encompassing the fictional or imaginary, making it real enough to be addressable, to be considered and critiqued and reflected on. Dilnot (2015) suggests that design simultaneously *states* "This!" and *asks* "This?" It has the power to render visible and tangible imagined situations, whether better or worse than the ones we are in; to design artefacts as 'tokens of better ages'; to apply ideas of utopia as a method (Levitas, 2013); and to inspire and open up vistas –if not always actual maps– towards different futures, through speculation and design fiction. What do designers do, if not, in some sense, give us experiential pockets of imaginaries –our own, reflected back at us, as well as visions of alternatives, fictional for the time being, but towards which we might be in transition? (see Experiential futures)

Figure 1. Teenagers at the Derby Silk Mill, Derby, UK, pinning up their drawings of "What does energy look like?", an investigation of energy imaginaries by Flora Bowden and Dan Lockton as part of the Helen Hamlyn Centre for Design and SustainRCA's SusLabNWE project. Photo by Dan Lockton.

Figure 2. Students at Carnegie Mellon School of Design construct 'mental landscapes' representing group imaginaries of projects, part of an investigation by Delanie Ricketts and Dan Lockton of the Imaginaries Lab. Photo by Dan Lockton.

As a process, investigating imaginaries starts by engaging with, and seeking to understand, people's existing collective or individual conceptions of their situation; how the systems around them work, from their perspective; and what mindsets accompany those conceptions (See Figure 1 and Figure 2). Then, through externalising those imaginaries, or making them tangible or engageable-with (e.g. Bowden, et al, 2015; Aguirre Ulloa, Paulsen, 2017), a community has the opportunity to reflect on and learn about its own thinking. Turning from this general process to consider futures imaginaries more specifically; surfacing a community's expectations, aspirations and beliefs about its own prospects can inform the development of deeper and more robust visions –while being firmly planted

in and cognisant of the contexts and cultures where those imaginaries are found. A simple way to do this is found in "The Polak Game", a brief and lively classroom activity based on the work noted above regarding the sociology and history of images of the future (Hayward, Candy, 2017). There are various typologies available for describing and mapping future imaginaries found among a population, including Ethnographic Futures Research (EFR) (Textor, 1995), Generic Images of the Future (Dator, 2009; Candy, Dator, Dunagan, 2006), and the Systems Mythology Toolkit (Hendricks, 2014). A framework for customising particular deployments following the whole process suggested above (map, multiply, mediate, mount, and map again) can be found in Ethnographic Experiential Futures (EXF), "a design-driven, hybrid approach to foresight aimed at increasing the accessibility, variety and depth of available images of the future" (Candy, Kornet, 2017).

Why have we included this?
Using the lens of imaginaries helps to sensitise both ourselves and others to the functioning and dynamics of what and how we imagine the systems we are in, as they are and as the might be. In this area, Transition Designers can serve a valuable role as translators or mediators between minds and ideas, and the world, between current situations and possible new ways of living.
Related: ethnography, ***experiential futures****, images of the future, phenomenography, mapping, mental models.*

Backcasting

Suppose you're trying to figure out how change could unfold—for yourself as a designer, or for a community.
One way to try to do this is to examine the evidence, past and present, and seek to discern in the tea leaves some pattern or portent of what is likely to occur next. There is a family of approaches for "forecasting", and quantities of effort and ink are expended in pursuit of this form of inquiry (Tetlock, Gardner, 2016; Silver, 2015). Efforts to extrapolate from what is known today into times to come, to cantilever conclusions from the seemingly sure footing of the present into the future's murky zone, often fail (Funk, 2017; Taleb, 2007), and many professional and academic futurists warn of the folly of a predictive stance when it comes to human affairs (Dator 1996).
But one might also approach the question in precisely the opposite direction. This other tack, another way of seeing, is about the creation of scenarios *backwards* from a posited point in the future. What if we stipulate, for the sake of argument, that the future we are interested in looks and operates *like so*, some number of years or decades from now. *What would it take in order for that to happen*? What would need to occur?
A prediction-minded onlooker may wonder what in the world could possibly be the basis for such speculation, and if accurate extrapolation is the name of the game, what we are suggesting here may seem a very odd thing to do: backwards, indeed. But understanding "the future" calls for inquiry ranging beyond whatever happens to seem most likely at any given moment. While an important frame, the probable shows us only part of the bigger

picture. As Candy points out in introductory futures classes, "Any single image of the future, no matter how compelling, is incomplete". For one thing, the probable is a constantly changing vista: Look at the moment-to-moment meanderings of any share price for a demonstration. Think how the punditry morphs on the day after a surprising election outcome. In the futures field there is a classic trio of possible, probable and preferable futures (Toffler 1970; Amara 1981), which helps serve as a reminder that the question of what appears most likely to transpire, if taken too narrowly, leaves underexamined equally vital questions of what else might occur instead (the possible) and what we might want or not want (the preferable).

The word 'backcasting' was coined and the approach originally proposed for a normative use of scenarios in the energy industry: "backcasts are not intended to indicate what the future will likely be, but to indicate the relative implications of different policy goals" (Robinson, 1982, p. 337). Its use has broadened in the years since, including development of participatory approaches incorporating perspectives from diverse stakeholders, although still typically with a normative bent: "The essence of the backcasting approach to future studies is the articulation of desired futures, and the analysis of how they might be achieved" (Robinson, Burch, Talwar, O'Shea, Walsh, 2011, p. 756).

Here we are using the term slightly more broadly still, not to refer exclusively to the development of normative scenarios, but as a lens or angle of approach, a structure of thought, which could be used to try to reason backward in exploratory fashion from any posited future outcome. This is the heart of a scenario generation process originated by Dator (2009, p. 16), elaborating 'generic images of the future', where the narrative pathways examined are not just preferred futures, but the most divergent set of trajectories possible; growth, collapse, discipline, and transformation (Dator, 1979; Dator, 2009; German, 2017).

The backcasting lens invites us to ask: in order for this to occur, what would need to happen? One can use it to inquire into the boundaries of the possible, and to deduce the approximate shape of what would be necessary to realise a particular pathway, positive or not. It may reveal new possibilities –or impossibilities.

Take for example entrepreneur and inventor Saul Griffith's examination of global renewable energy. Calculating humanity's annual energy spend for the early 2030s at a modest total of 15 terawatts, he describes the challenge of renewably meeting this target:

> It's not the Manhattan Project, it's not the Apollo Project –they were science projects. The project we have to do is much more like World War II, except this time [all countries] play on the same side. That's [the scale of] what you need industrially (Griffith, 2008).

A particular method that may help operationalize this lens (again, for any scenario) has been developed over the past decade; a heuristic for looking at transitions through "Three Horizons" (Hodgson and Sharpe 2007; Curry and Hodgson 2008; Wahl 2016). In essence this method divides the transitional process, whatever it may be, into three phases: now (horizon one), then (horizon three), and the interim phase between (horizon two). It provides a way of attending to and creating a narrative out of whatever is really at stake in transitioning from one state of affairs to another (See Figure 3).

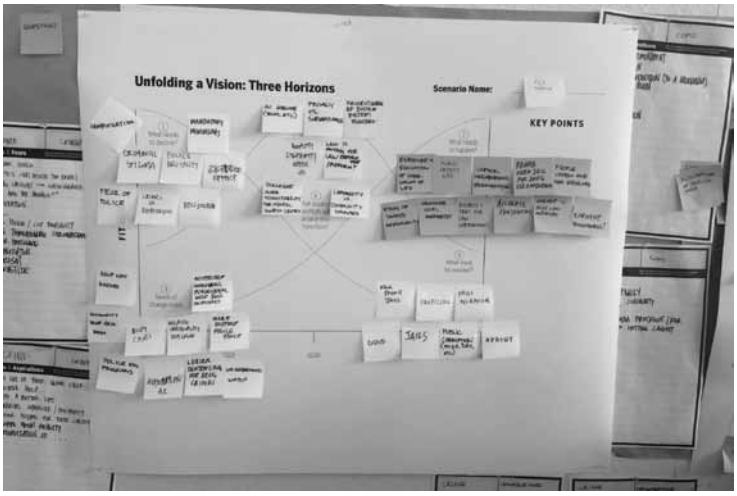

Figure 3. A transitional scenario in progress, constructed by Carnegie Mellon School of Design undergraduates working backward from their own ideal visions for 2050, as part of a class taught by Stuart Candy, Terry Irwin and Stacie Rohrbach. Photo by Stuart Candy.

Effective use of the backcasting lens would help not only with avoiding the vicissitudes of extrapolative thinking, but also the temptation of dominating discussion with a single preferred future. Just as it is insufficient to examine change with an eye only to the probable, in designing for transition with normative ideals in view, the risk perhaps lies in excessive focus on defining a single positive future; navigating, as it were, with only one point of reference. Here too: Any single image of the future, no matter how compelling, is incomplete. The attempt to try to deduce one's way backward from there to actions today. This 'deficit model' in planning embeds a dangerously brittle and linear conception of what bringing desired change into being entails. What is called for instead is a thinking environment or mental ecology (see Experiential futures), one rich enough with reference points that you know what you're looking to avoid, as well as what to pursue, and so that you are poised to meet whatever. To venture an analogy to the importance of biodiversity in an ecosystem, or disciplinary range and neurodiversity in a team investigating a complex topic; resilience comes from requisite variety (Conant, Ashby, 1970; Dubberly, Pangaro, 2007).

Why have we included this?

Backcasting may not be the only way to stretch and test our mental models of what tomorrow may bring, but it might be one of the most useful. This lens, applied not solely to 'planning' but to ensuring a diverse range of images of the future, we surmise, may well be a critical part of a healthy and transition-capable society (see Imaginaries). It seems a good candidate for key resources one might identify as necessary for navigating the wildly multivariate, hyperdimensional process of moving through history. Not a single, official, doctrinaire commitment, monomaniacally pursued (numerous instances of which, par-

ticularly from 20th century history, we leave the reader to imagine for herself). A constellation of alternatives to think with; not the ideal or preferred alone, but imaginal diversity.
Related: alternative futures, deductive forecasting, ***experiential futures****,* ***imaginaries****, scenario generation, visioning.*

Dark Matter

The systems approach embraced by Transition Design (e.g. Kossoff, 2015; White, 2015) recognizes explicitly that there is more involved in change at scale and over time than simply the decision to redesign a product or service in isolation. Designed artefacts, services, and even software, are embedded in contexts, bound up in the practices and cultures of everyday life, and the organizational priorities, traditions, and structural legacies which end up determining what actually gets designed, by whom, and who has agency to change it. Laws, standards, conventions, histories, prejudices, algorithmic biases, path dependency, the actions of actors elsewhere, and a whole range of other factors (see Imaginaries) are all part of the systems within which designers seek to act.
A Transition Designer should thus be able to be more effective through paying attention to these (evolving) contexts as much as to the 'thing' itself, to design with insight into the ways in which the (often largely invisible) aspects of systems will work to support or constrain change. As Transition Design education develops, we might find it necessary to incorporate modules for learning about these systems, through classes about as well as practical engagement with public policy, management, community organizing, and a range of other topics not usually included in a 'design' education. This could be framed as a call for more attentiveness to *infrastructures* within design. Infrastructure

> Never stands apart from the people who design, maintain and use it. Its designers try to make it as invisible as possible, while leaving pointers to make it visible when it needs to be repaired or remapped. It is tricky to study for this reason (Star, Bowker, 2002, p. 230).

Urbanist Keller Easterling, describing her concept of 'infrastructure space', notes that "[s]ome of the most radical changes to the globalizing world are being written, not in the language of law and diplomacy, but in these spatial, infrastructural technologies" (Easterling, 2014, p. 15).
Star (a sociologist) and Bowker (an informatician) note that infrastructures often only become visible on breakdown, only apparent when they fail or stop working, or perhaps impede planned changes to a system. This relates to what Hill (2012, pp. 83-85) has called "the dark matter of strategic designers… organizational culture, policy environments, market mechanisms, legislation, finance models and other incentives, governance structures, tradition and habits, local culture and national identity, the habitats, situations and events that decisions are produced within". Hill uses the term specifically to refer to "what makes it difficult for installations to scale", the (metaphorical) "material that absorbs or rejects wider change" beyond a one-off prototype or demonstration. He argues that:

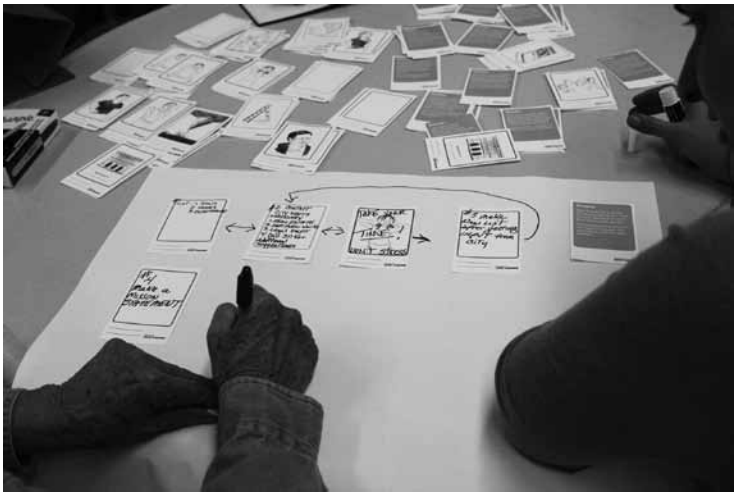

Figure 4. Members of the public in Pittsburgh, PA, create maps of their perceptions of the 'dark matter' of local government, as part of the Imaginaries Lab's Civic Visions project (Ashlesha Dhotey, Theora Kvitka, Nehal Vora, Silvia Mata-Marin and Dan Lockton). Photo by Ashlesha Dhotey.

> [A] genuine and concerted engagement with dark matter is what would enable an intervention to become systemic, permanent, influential… the strategic designer has to understand the characteristics of dark matter just as designers might understand wood, steel, glass, pixels and grids.

There is an extension to this argument which suggests that the ways in which different actors or stakeholders may perceive the dark matter (See Figure 4), or not, is also worth paying attention to: what is invisible to one person may be very visible to others. For example, Mata-Marin and Lockton (2017) examine how migrants in the US experience 'borders' in everyday life, through designed artefacts such as credit cards and drivers' licenses –regulating access and exerting control by embodying politics of difference– but which may be completely seamless to other people in the system.

There are also parallels with concepts such as Conway's Law (Conway, 1968; Brooks, 1975) –an organisation designing a system will create a system which replicates the communication structure of the organisation that designed it. Does Transition Design necessarily involve attention to (re-)designing the organisations involved in a project, to improving or reforming communication structures within a community, or between the community and other interested stakeholders such as local councils, utilities, transport authorities, and so on? Star and Bowker (2002, p. 233) suggest that "[f]requently a technical innovation must be accompanied by an organizational innovation in order to work: the design of sociotechnical systems engages both the technologist and the organisation theorist".

For Le Dantec and DiSalvo (2013, p. 247), the role of the designer engaged with infrastructure should be "the work of creating socio-technical resources that intentionally enable adoption and appropriation beyond the initial scope of the design, a process that might

include participants not present during the initial design". This approach which would see dark matter, perhaps, as something Transition Designers could actively consider using and manipulating, to turn it into a platform for communities to adapt and adopt themselves.

Why have we included this?
'Dark matter' can be a useful lens for reminding us to pay attention to the elements of the system which designers might not traditionally have considered relevant, and for developing a more comprehensive account of how change happens.
Related: infrastructuring, sociotechnical systems, complexity

Circularity

The idea of the *self-fulfilling prophecy* (Merton, 1948; 1995) is well-known enough to pass without much comment. But it is worth explicitly considering it in relation to visioning and Transition Design. Most obviously, there is the point that compelling visions of "desirable" futures are partly, presumably, intended to inspire people to work towards making those visions reality –to fulfil the prophecy. More nuanced treatments of futures (see Experiential futures) tease out some of the issues wrapped up in this idea.
Equally, though, prophecy can bleed into our imaginaries of the present –the ways in which we define our current situation, and how potential futures link to it, can end up structuring and determining the ways we act now. The sociologists Thomas and Thomas (1928, pp. 571-2) suggested that "If men define situations as real, they are real in their consequences", and thinking along these lines, we see that there can be a self-fulfilling nature to imaginaries. If we believe something to be real, and act as if it is real, and design and build institutions and infrastructures around that 'reality', the effect may be the same as if it had been real in the first place. What were once fictions become fact.
For example, the journalist Metcalf (2017) discusses the self-fulfillingness of imagining society as a market, drawing on Hayekian ideas: "The more closely the world can be made to resemble an ideal market governed only by perfect competition, the more law-like and 'scientific' human behavior, in the aggregate, becomes". In a design context, the idea of a kind of circular causality in which designers' models of users (Lockton, et al, 2012) or the assumptions or models imposed by clients, funders or other commissioners of work end up being designed into systems which then effectively make those imaginaries real, is not uncommon. Conversely, as pioneering scenario thinker Herman Kahn observed, "prophecies can be self-defeating as well as self-fulfilling" (Kahn, 1962, p. 18).
Design affects what people do, and what people perceive they *can* do. Everything around us that has been, or is being, designed, from the layout of our cities to the infrastructure of our governments to the way our doctor's surgery receptionist answers the phone, in some way influences how we engage with and make use of it, how we make decisions, what is easy and what isn't. It also, over time, affects how we think, and how we understand the world that we're part of, both individually and together as a society. And it affects our belief in our own agency, our own ability to change things (Carter et al, 2017). Designed artefacts, services, software or other elements of systems which embed particular notions

of human nature (Lockton, 2016; Lockton, Ranner, 2017) can, over time, lead to people acting in ways which come to *match* the models that the designers have of us or want us to become. As both Lanier (1995) and Dunne (2006) have expressed in different ways, if things that people use are designed with a caricatured model of a human, they may end up making that caricature real: we may end up behaving in the way the models assumed anyway, because we are configured by the systems and structures in which we live our lives –a curious form of self-fulfilling prophecy. Or put another way, perhaps, irony.
So in designing for transitions, within systemic contexts, it is worth reflecting on the *circularity* of the endeavours we are engaged in: to what extent are the variables that we believe they are shaping actually in turn shaping us, and the actions we take? Architect and cybernetician Glanville (1995) used the example of a thermostat 'controlling' the room temperature, but itself being controlled by the room temperature. Even this simple causal shift –considering a system from the perspective of the entity we normally assume to be in control– can provide new insights into the agency we have as designers. For example, how are transitions shaping designers, just as designers shape transitions? How does our work contribute to or co-create the issues we are seeking to address? Does concern or panic about futures lead to concern and panic being normalised or designed into the system? How can we use this approach in a more positive way? By analogy to the idea that the legal system and lawyers co-create the need for each other, how do we avoid this happening with Transition Design?

Why have we included this?
Much design which aims to have an effect on social or environmental issues becomes itself constrained by or locked into assumptions about those issues, becoming part of the system it seeks to affect; or the changes it makes end up reproducing the structures of the problems that led to the need for intervention in the first place. There is value in Transition Designers being attuned to irony, aware of this self-fulfilling risk, and examining closely the assumed causal links embedded within projects and approaches.
Related: ***circularity***, ***imaginaries***, *irony, reflexivity, second-order cybernetics*

Experiential futures

To design is to grapple with the future. To design for civilisation-scale transition, even more so. The trouble with 'the future' is that it doesn't exist. It's a construct, a stew of more or less examined assumptions and interpretations carried over from the past, blended with extrapolations of trends and emerging issues in the present, inflected through hope and fear to produce fantasies and imaginaries projected into various quarters of the possible, probable, preferable, and their opposites.
It turns out that the troubling nonexistence of the yet-to-be is also an opportunity. Pages unwritten await their authors. The futures in our minds may sometimes pretend to us that they simply reflect on and respond to the outside world, but they are a technology of discourse and agency, a special subset of imaginative storytelling. While seeming merely to be inspired by observed change –they are in fact covertly shaping it.

Experiential futures refers to a set of approaches to make alternative futures present. The juxtaposition of 'experience' and 'future' is a deliberate contradiction: the here and now, the impressions of senses and mind, 1:1 scale reality as we experience it moment to moment; all this set against an inherently abstract notion of the to-come, by definition absent, forever at a temporal remove. Experiential futures (XF) seeks to make productive use of that contradiction, and harness the energy of its friction, by collapsing the distance, rendering absent and abstract futures cognitively and culturally tractable.
An experiential scenario is a future brought to life. It's a tangible 'what if', more textural than textual, and a way of thinking out loud, materially or performatively, or both. Seeking to collapse temporal distance and offset our habitual discounting of future events (Ainslie, 2001), XF angles for 'what ifs' real enough to trick the body into taking them seriously. Its contours are generous, taking in "the gamut of approaches involving the design of situations and stuff from the future to catalyse insight and change" (Candy, 2015, p. 18). XF

> Involves designing and staging interventions that exploit the continuum of human experience, the full array of sensory and semiotic vectors, in order to enable a different and deeper engagement in thought and discussion about one or more futures, than has traditionally been possible through textual and statistical means of representing scenarios. (Candy, 2010, p. 3)

As a lens, it is an invitation: how might you take your idea –any idea– of a future and bring it concretely to life, now? This move may be motivated by a wide diversity of agendas from the exploratory to the evangelical, the entertaining to the educational (Candy, 2010, p. 114). Any reason to think or feel into any future is a reason to mediate it, make it experiential. The matter of interest is not the design of artefacts per se, but the design of circumstances for thought (which may manifest as or incorporate artifacts). Less contents than context; less stuff than situations; less the things themselves than the conversations, insights and actions they enable. In each case, the latter implies and includes the former as appropriate:

> We must make our freedom by cutting holes in the fabric of this reality, by forging new realities which will, in turn, fashion us. Putting yourself in new situations constantly is the only way to ensure that you make your decisions unencumbered by the inertia of habit, custom, law, or prejudice –and it is up to you to create these situations. (Graeber, 2015, p. 96)

Some experiential futures examples from among many (for more see Candy, 2010; Candy, Dunagan, 2017):

- A product that immerses its user in a simulation of natural environments, apparently promoting the health of stressed-out urban office workers in the early 2020s, launched and demonstrated in the midst of a large (real, present-day) interior architecture trade show (Alter, 2016).

- A technology for babysitting infants in a virtual pod, presented in a present-day art museum, but surrounded by the accoutrements of a commercial sale context (product specifications, price banners, brochures), as one might find them in an electronics store in the next decade (Furness, 2017).
- A special future edition of the New York Times, reporting from the following year and embodying a fulfillment of progressive/liberal fantasies, handed out to commuters in the streets of Manhattan (Lambert, 2009).

The view through this lens is the capacity to regard the effective engagement with futures as about the generation or construction of scaffolding to think and feel with. The entire sensory and semiotic context of the body is the relevant canvas –and not just for the individual, but also for groups. 'The Time Machine', a room where you can inhabit a pocket of (say) the year 2040 for (say) 20 minutes, is one example of a pattern for immersive scenario creation that becomes possible through this lens (Candy, 2013; Candy, 2014).
Consider the philosophical concept of the 'extended mind' (Clark, Chalmers, 1998; Dunagan, 2015): thought isn't contained exclusively inside our skulls, but it occurs in and with our environments. This view could be adopted as a frame for all sorts of ordinary, existing practices, but it can also be taken further. If a notebook or whiteboard is a convenient prosthesis for memory, an experiential scenario is a prosthesis for imagination. It is a provisional, localised, and made-to-order 'mental ecology' (Bateson, 1972). The manifestation an imagined future context (see Imaginaries) variously in forms tangible, material, interactive, playable and performative, provides a wealth of opportunities to think and feel with beyond producing the most eloquent report. Experiential futures uses the idioms of reality to mediate hypothetical as *hyper*thetical, something *more than* just a thesis; an almost-real place.
Media theorist McLuhan's concept of the anti-environment may be useful here. The anti-environment relates to the environment in a sort of dialectical figure/ground relationship whereby the former highlights the unnoticed or taken-for-granted properties of the latter (the fish out of water realises with a jolt, at last, what it has been swimming in). "It is useful to view all the arts and sciences as acting in the role of anti-environments that enable us to perceive the environment". (McLuhan, 1967, p. 42)
So: all possible futures (literally an unimaginably vast space of stories one might tell) multiplied by all possible situations and stuff from within each. This represents a dazzling astronomical superabundance of in-principle design possibility. It is both wildly transdisciplinary and transmedia in character. That does not mean that the result or the ideal is an all-encompassing, extravagant *gesamtkunstwerk*: it is simply a medium-agnostic design opportunity. Simplicity will often be best, but it is perhaps the "simplicity on the other side of complexity" (reputedly prized by Oliver Wendell Holmes). It's more a matter of producing circumstances than a report, a video, or a telling artifact: any one of those things may indeed turn out to be the best thing for the job, but it's noting and avoiding an unjustifiably specific assumption that is key. (See Figures 5 and 6)

Why have we included this?
All of the above brings into focus the critical need for thoughtful and critical attention: what futures to choose to manifest in this way, when we consider transitions? Prototyping

Figure 5: Visitors to a large interior design and architecture show interact with NaturePod, a hypothetical future product demonstrated and launched at the show as if it were commercially available. Installation by Situation Lab, photo by Connie Tsang.

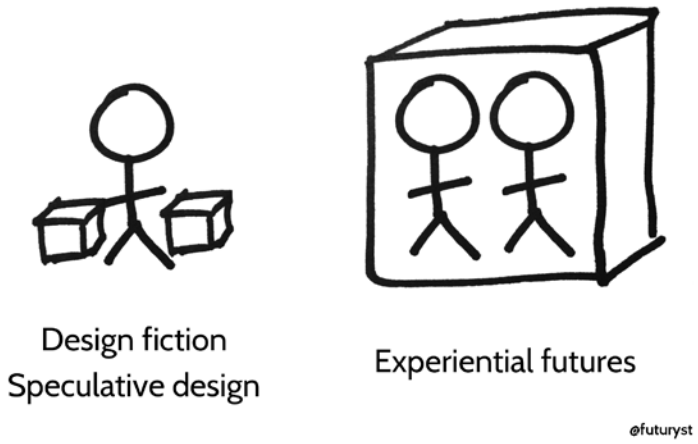

Figure 6. The lens of experiential futures invites attention to whatever it takes to create an effective context scaffolding thought and feeling about possible futures. Diagram by Stuart Candy (thanks to Greg Van Alstyne). Originally published in Candy, Dunagan, 2017.

or performing something random that is purportedly 'from the future' might seem worth it as a lark, the first time or two, but sooner or later the mere conceptual novelty of long-range prototyping for its own sake has to wear off. What is left is perhaps a closer attention to *which futures*, in *whose interests*, with *what effects*. Deeper questions. More critical questions. Opportunities to do better.

Related: critical design, design fiction, experiential scenarios, guerrilla futures, ***imaginaries****, immersive storytelling, speculative design, transmedia, worldbuilding*

New Metaphors

It has been argued that metaphors and analogies are central to much human reasoning, understanding, and creativity (Hofstadter, 2001), as well as the language we use (Lakoff, Johnson, 1980). Here we use the term 'metaphor' in a broad, intentionally imprecise way, to refer to a class containing a variety of ways in which one thing can be understood in terms of another.

One simple reason for metaphors' prevalence is that by mapping features of an existing or familiar situation onto a new or unknown one, we are enabled to grasp and (be more confident that we can) understand it more quickly. As such, metaphors are often used strategically in design (Saffer, 2005; Cila, 2013; Hekkert, Cila, 2015). Nevertheless, metaphors are not *the thing itself* –they are always an abstraction, a model of the situation rather than the situation modelled. They can be a map to a territory, but should not be mistaken for the territory. As with models, all metaphors are wrong, but some are useful (Box, Draper, 1987). The constraints, affordances, and assumptions that a metaphor suggests or imposes can themselves condition or structure our interaction with, or approach to, a new situation, as we understand, or come to understand it in terms of the old. Metaphors become "enabling constraints" (Hayles, 2001, p. 144). The hunt for "defensible metaphors", to use cybernetician Gordon Pask's term (Scott, 2017), is not trivial.

So, how does this apply to Transition Design? As a corollary lens of 'imaginaries', we suggest not just attempting to understand the existing metaphors in use in a situation, but actively generating, proposing, and following through the implications of *new* metaphors (Cila, 2013; Schön, 1979; Jung et al, 2017) for concepts pertinent to the frame of transition taking place –and the potential futures embodied in visioning. This is not primarily about devising novel metaphors for the specific design of products or interfaces –although this work is interesting– but, at a system level, something closer to Klaus Krippendorff's (2006, p. 11) notion that designers could "create and start using new metaphors, new vocabularies, and new ways of languaging, like poets and science fiction writers do, thus bringing forth new ways of conceptualizing the world and encouraging new practices". Mary Catherine Bateson (1984), in her own work, and in discussing the work of her parents Margaret Mead and Gregory Bateson, has also frequently employed the idea of reframing societal issues through using new metaphors, for example "the idea of 'home' as a place to give and receive nurture" becoming "a new metaphor for the workplace" (Moyers, 1988). It is worth noting here that White (2015) considers aspects of Transition Design itself to be based around the application of metaphors from ecosystems to social systems.

One significant area where new metaphors might offer opportunities for transition is the economy. A number of economists (e.g. Landau, Keefer, 2014) have noted the ways in which the metaphor of 'the national economy is a household budget', commonly employed by media and politicians alike, is not just an oversimplification but a structural error in terms of many key features of the systems under discussion, such as fixation on 'balancing the books'. This leads to specific decisions being made (austerity policies for example) that arguably cause harm or restrict the ability of the system to adapt to changes in circumstances. How would public political discourse on the economy be different if a different metaphor were used? (We can imagine ideas such as 'the economy is a garden'

Figure 7: Participants at an Imaginaries Lab New Metaphors workshop run by Dan Lockton and Sarah Foley at the Google SPAN conference, 2017, talk through their ideas for new metaphorical representations of concepts. Photo by Dan Lockton.

or 'the economy is a loaf of bread being baked.') Would it be better used to *explain*, or to *persuade*? Or both?

Why have we included this?
The art of designing new metaphors and framings is well advanced in political contexts (Lakoff, 2014) and increasingly in corporate settings (Erard, 2015), but has been under-explored in design and futures, and offers potential for Transition Designers to enable communities to think about, envision, and understand their current situation and possible futures, both locally and at global scale, in new ways. The new metaphors can be generated in a number of ways, from matching 'structural features' of situations, to a semi-random process of bisociation (Koestler, 1964; Lockton, forthcoming– See Figure 7). But a participatory process in which communities co-design the new metaphors, involving people in understanding their own and each other's understanding as the metaphors are constructed and explored seems preferable from a transition point of view to one where new metaphors are imposed by an authority seeking to persuade.
Related: frames, ***imaginaries****, lenses, worldbuilding*

Reflection

One of our aims in entering the Transition Design discourse is to find ways of working practically which embody and advance the ideas inherent in the Transition Design paradigm, while making use of the many techniques and methods developed in other fields

(among them foresight and futures studies, design for social change, systemic and strategic design, and more) and iterated over the course of projects and engagements.

This modest collection of ideas is put forward partly as a provocation, partly as potential departure point for a more comprehensive endeavour, and partly as an invitation for others working within, or interested in, Transition Design to contribute lenses they find useful for new ways of seeing. Please do suggest your own.

At this moment, the vocabulary for vision in designing for transition is of course fragmentary. But this will change. Part of the transition at stake is our internal, collective, developmental shift from preliminary, tentative and miscellaneous beginnings, to an expanding reference universe of cases and terms, and a better established sense of how to do what needs to be done. Lately, efforts inspired by the framing concept of the 'pattern language' have begun to outline the makings of a body of practice with similar large-scale transitional and transformational intent (Finidori et al, 2015; Baumgartner et al, 2016). The question we conclude with for the moment, then, concerns how we might ultimately build a collection of transitional lenses into something more systematic: what would a pattern language for Transition Design look like?

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Resumen: Las "visiones de futuros sostenibles" se han propuesto como un componente clave del diseño para la transición, "un medio a través del cual los estilos de vida contemporáneos y las intervenciones de diseño pueden evaluarse y criticarse contra la visualización de un futuro deseado" (Irwin et al, 2015a, p. 8). Tales ambiciones son necesariamente de amplio alcance, y requieren unir líneas sobre el diseño y la especulación de diversas fuentes. Aquí buscamos aumentar el impulso explorando un conjunto de conceptos que se relacionan particularmente con este papel de visión en el diseño de transiciones. Sobre la base de perspectivas y proyectos de otros campos, presentamos elementos de un vocabulario visionario, que abarca diferentes escalas y grados de eliminación del presente, y la ubicación de estos términos en relación con los desafíos específicos y las oportunidades para el pensamiento y la práctica de la transición.

Palabras clave: Futuros - imaginarios - visión - transición - diseño.

Resumo: as visões de futuros sustentáveis se propuseram como componente chave do design para a transição, um meio através do qual os estilos de vida contemporâneos e as intervenções do design podem ser avaliadas e criticadas contra a visualização de um futuro desejado (Irwin et al, 2015a). Essas ambições são necessariamente de amplo alcance, e requerem unir linhas sobre o design e a especulação de diversas fontes. Aqui procuramos aumentar o impulso explorando um conjunto de conceitos que se relacionam particularmente com o papel de visão no design de transições. A partir de perspectivas e projetos de outros campos, apresentamos elementos de um vocabulário visionário, que abarca diferentes escalas e graus de eliminação do presente, e a localização destes términos em relação com os desafios específicos e as oportunidades para o pensamento e a prática da transição.

Palavras chave: futuros - imaginários - visão - transição - design.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Cosmopolitan Localism: The Planetary Networking of Everyday Life in Place

Gideon Kossoff *

Abstract: Globalization is at the root of many wicked problems to which localism has been a common response. However, such problems are usually too complex and interconnected to be resolved at the local level. Furthermore, if the future place-based lifestyles advocated by Transition Design are to be of high quality, it will be necessary to develop forms of everyday life that are self-organized and networked at multiple scales: from households through neighborhoods, cities, regions, and the planet. This symbiotic connection between different levels of scale of everyday life, from the local to the planet as a whole, would integrate two longstanding and distinct traditions –cosmopolitanism and localism– and would be the basis for a new kind of social, cultural, political and economic settlement, Cosmopolitan Localism.

Key words: globalization - networks - localism - Cosmopolitan Localism - cosmopolitanism - self-organization - wicked problems - lifestyles - everyday life - Transition Design.

[Abstracts in spanish and portuguese at pages 65-66]

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Introduction: Cosmopolitan Localism as a Transition Design Strategy

If Transition Design aims to "reimagine and remake the human presence in the world," as environmentalist David Orr (2002, p. 3) argues is necessary, it needs compelling visions of sustainable, long-term futures and a conceptual framework to guide tangible actions to realize these visions. This paper argues that the nascent concept of Cosmopolitan Localism (Manzini, 2011; Ramos, 2017; Sachs, 1999, Tonkinwise, 2015) needs to be developed

so that it can inform powerful visions of futures in which entire lifestyles are reconceived to be more sustainable. Such visions can guide and assist solutioning in the present.
Cosmopolitan Localism is the theory and practice of inter-regional *and* planet-wide networking between place-based communities who share knowledge, technology, and resources. It offers a timely and powerful alternative to globalization: the planet-wide process through which human affairs –in particular, economies– become interconnected in ways that degrade ecosystems at a local and planetary level, undermine local communities and the social fabric, and erase cultural diversity (Cavanagh & Mander, 2004; Ritzer, 2010; Sachs, 1999). Cosmopolitan Localism suggests a new social, political, cultural, economic and technological "settlement" that could help address many of the 21st century's wicked problems (Buchanan, 1995; Coyne, 200; Rittel & Webber, 1973). It also suggests that we do not have to choose between our immediate, geographically proximate community and the larger community of humanity. Indeed, we cannot afford to make this choice: the fate of humanity and planetary ecosystems are inextricably intertwined at the local and global level.
In a cosmopolitan-localist system, we can have attachments, commitments, loyalties, and a sense of belonging at multiple levels of scale: to our locales, other locales, and the planet as a whole. These locales would be the setting for rich, place-based lifestyles that are united and networked to address the complex issues of the 21st century through a spirit of cooperation, interdependence, and mutual learning. This vision of place-based, diverse lifestyles contrasts with globalization's drive towards homogenization –its promotion of similar lifestyles, regardless of particular cultures, histories, and ecosystems (Sachs, 1999).
Cosmopolitan Localism is situated within the *visions* area of the Transition Design framework (Irwin, 2015). It embodies a utopian sensibility in that it contrasts *what could be* with *what is* (a desirable future vs. the dysfunctional present) but it is not utopian in the sense that it is detached from reality, or that it depicts an impossible scenario: there are many indications that a "spirit of Cosmopolitan Localism" is emerging within the contemporary landscape. This is partly evidenced by the increasing number of initiatives and movements that challenge dominant forms of governance and business. These include social movements such as the World Social Forum, a global but decentralized network of non-governmental organizations and social activists collectively working towards alternatives to globalization (de Sousa Santos, 2006); emerging global networks of collaborating municipalities responding to the inaction of national governments, addressing major contemporary issues (Barber, 2013); and information and communication systems that allow global sharing of knowledge and skills by peer-to-peer networks and commons activists (Kostakis, Niaros, Dafermos, & Bauens, 2015; Ramos, 2017). Cosmopolitan Localism represents what utopian philosopher Ernst Bloch called "The Not-Yet", the emergent and progressive dimension of history, the manifold expressions of which *may* or *may not* come to fruition (Daniel & Moylan, 1997; de Sousa Santos, 2006). A key task of the transition designer, therefore, is to identify and foster the "Not-Yet" of Cosmopolitan Localism.
Cosmopolitan Localism was first articulated in the 1990s (Sachs, 1999). It can be understood as an expression of the socially and politically radical spirit of the previous decades, but since that time the concept has been explored only sporadically. This paper argues that Cosmopolitan Localism can be advanced through the integration of two separate, but highly developed, traditions of *cosmopolitanism* (Brown & Held, 2010; Delanty, 2012;

2017) and *localism* (Douthwaite, 1996; Hopkins, 2008; Jacobs, 1970; Max-Neef, 1991; Norberg-Hodge, 2000). For this reason, the evolution and basic principles of each tradition (as discussed by economists, anthropologists, philosophers, and activists) are discussed in the following section. It is hoped that Cosmopolitan Localism can incorporate the insights of each tradition, whilst addressing their respective shortcomings.

Origins of Cosmopolitanism and Localism

Localism and cosmopolitanism have long traditions, both in theory and in practice. Cosmopolitans have advocated and sought to institutionalize the unity of humanity regardless of national borders, in an effort to address the tendency towards local self-interest and chauvinism (Brown & Held, 2010; Delanty, 2017). Localism has sought the freedom for communities to manage their own affairs and to live without the imposition of authority and control by external agencies. However, both have been transformed in the last few decades by globalization and the complex social, ecological, cultural, and political problems mentioned above.

The origins of cosmopolitanism in the West extend back to Ancient Greece when the philosopher Diogenes declared himself a "citizen of the world" (Nussbaum, 2010, p. 29), but similar philosophies regarding the unity of humanity can be found in many non-European traditions, including Islam, Buddhism, Hinduism, and Confucianism (Delanty, 2017). Cosmopolitanism's modern day agenda was established by the philosopher Kant, who argued for the moral desirability and historical inevitability of a league or federation of sovereign republican states, guided by international law and based upon the right of individuals to "hospitality" in foreign territories (Brown, 2010, pp. 45-60).

As a concept, the origins of localism are more difficult to date, since for most of history, most people have lived local, place-based lives (albeit these were often within centralized empires or nation-states). Social philosopher Kirkpatrick Sale (2007) argues that history has been punctuated by "the impulse to local governance, to separatism and independence, to regional autonomy …one gets the sense that these next few decades may provide its chance again" (p. 279). Perhaps the difference between the localism of previous eras and the localism of today is the scope of the challenge it now faces. In no other era have place-based lifestyles, cultures, and economies, that are adapted to their local ecosystems, been so extensively undermined or extinguished.

Important Aspects and Principles of Contemporary Localism

The advantages of local economies have been extensively argued; urbanist and sociologist Jane Jacobs (1970) contended that the strategy of import-substitution (the process through which locales come to produce for themselves goods and services that were previously imported) has always unleashed a multiplier effect that has been the key to urban and regional prosperity and innovation (Jacobs, 1970). Similarly, economist Richard Douthwaite (1996) has demonstrated how dependence upon external investment con-

nected to a fragile global economic system, drains communities of resources and undermines their resilience. Anthropologist Helena-Norberg Hodge (2000) has extensively documented how the culture, economy, and social fabric of the once place-based Ladakhi community in India have been undermined by the centralizing forces of the Indian state and the market economy. Arguing for localization, Norberg-Hodge (2012) says "the essence of localization is to enable communities around the world to diversify their economies for as many of their needs as possible from relatively close to home" (p. 65). Localists concur that by producing for themselves as many goods and services as is reasonably possible, communities can develop a better quality of life, reinvigorate local culture, minimize their environmental impact, and lessen their vulnerability to "external perturbations," such as fluctuations in the global economy (Hopkins, 2008).

In addition to localizing economies, localists also seek a renewed relationship with place, as it is defined by culture, history, and ecosystem. This dimension of localism has been best articulated by bioregionalists who maintain that our modernized and globalized lives have become divorced from the ecological processes that characterize the *particular places* –the bioregions– that we inhabit (Berg and Dasmann, 1990). These emerge out of the interaction between human activity, climate, watershed, flora, fauna, soils, and topography. While transition town activists have adopted the term *resilience* to describe the practices through which communities can protect themselves from the vagaries of the global economy and climate change, bioregionalists have coined the term *reinhabitation* to describe the practice of 'living-in-place', in attunement with the bioregion. Bioregionalists Berg and Dasmann (1990) state that:

> Living in place means following the necessities and pleasures of life as they are uniquely presented by a particular site, and evolving ways to ensure the long-term occupancy of that site. A society which practices living-in-place keeps a balance with it region of support through links between human lives, other living things, and the processes of the planet –season, weather, water cycles– as revealed by the place itself. (p. 35)

Local economies must therefore be bioregionally adapted. Returning to the connection that Helena Norberg-Hodge makes between localization and needs satisfaction, localization can be described as the process through which human needs are satisfied within the constraints and opportunities presented by particular bioregions.

Important Aspects and Principles of Contemporary Cosmopolitanism

Contemporary cosmopolitanism asks how humanity can best cohabit a globally- interconnected planet. Sociologist Gerard Delanty (2012) argues that although the cosmopolitan theory of recent decades has typically focused on the possibilities for global democracy, transnational citizenship, and universal rights, it is better characterized as a concern for the ethical, political, cultural, and societal implications of the encounter between different peoples: "The cosmopolitan imagination occurs", Delanty argues, "wherever new relations

between Self, Other and World develop in moments of openness…a reframing of identities or loyalties and self-understanding in ways that have no clear direction" (p. 59).
This *ontologically relational* imaginary, Delanty (2012) argues, is not the traditional cosmopolitanism based on universal moral norms. Rather, it is a dialogic and co-evolutionary "post-universalistic" cosmopolitanism committed to diversity, reflexivity and the interaction and mutual transformation of "collective identities" (p. 177), from which new normative cultures may emerge. Cosmopolitanism, in short, is about the encounter between cultures on equal terms, and the possibility that new ways of being in the world may arise out of this encounter. In a future in which societies and cultures embody this cosmopolitan imaginary, the global order would be founded on self-organization, a process of "immanent transcendence…internally induced social change" (Delanty, 2012, p. 251), of place-based communities with diverse lifestyles. Whilst a vision of this future is currently inchoate, the cosmopolitan imaginary is reflected in pluralistic and self-organizing civil society networks such as the World Social Forum, which has a categorical anti-neoliberal and anti-globalization agenda (de Sousa Santos, 2006).
In contrast, the international bodies (eg. The UN, ASEAN, the EU, the African Union and the International Court of Justice) that actually have the authority to address global issues, are comprised of nation-states whose sovereignty impedes the necessary cooperation. In as much are these bodies are federations of sovereign states they have their roots in the cosmopolitanism of Kant and the Enlightenment (Brown, 2010). The political philosopher Benjamin Barber (2013) notes that the very notion of sovereignty, which is at the heart of the modern political system, pits nation-state against nation-state. Sovereignty invests nation-states with the freedom to act with authority inside their own borders whilst discouraging collaboration across borders, making it unsuitable in "addressing the multiplying problems of an interdependent world" (p. 3).
These international bodies suffer from the same dysfunctions as their member sovereign states. According to political philosopher David Held (2010a), they are unrepresentative of and have limited accountability to, their many stakeholders. Institutional fragmentation means that remits are uncoordinated and overlapping and that issues fall, or are pushed, between the cracks. This results in an "inability to mount collective problem-solving solutions faced with disagreement over means, objectives, costs and so on…there is a fundamental lack of ownership of global problems…It is far from clear which global public issues…are the responsibility of which international agencies" (Held, 2010a, 299). Held (2010b) argues that the solution lies in cosmopolitan democracy, which seeks to reform this system through increased transparency; reorganized international bodies; separation of economic and political interests; new political institutions at global and regional levels; enhanced and coordinated legal systems; and the encouragement of civil society.
Although these proposals have much to recommend them and they contain elements of both Enlightenment and contemporary cosmopolitan imaginaries, they rely on the willingness of sovereign nation-states and transnational corporations to cooperate and willingly relinquish power. They do not challenge the fundamental premises of globalization and suggest that we should have more, not fewer, of the kinds of institutions that are currently failing to address global issues. This is not a cosmopolitan vision that unfolds

logically out of a relational ontology but one that patches up a system that originated in another era when global imperatives were very different.

Need to Integrate Cosmopolitanism and Localism

It would be mistake to dichotomize contemporary cosmopolitanism and localism, since they both acknowledge the need for an improved relationship between the local and the global and they have the shared aim of addressing problems caused by globalization. Localists warn against "walling off the outside world" (Shuman, 2000, p. 28) and promote self-reliance rather than self-sufficiency, trading and sharing resources in ways that are environmentally and socially sustainable. Localization advocates Raymond de Young and Thomas Princen (2012) argue that "place-based localization includes institutions at the regional, national, and international levels", and poet and bioregionalist activist Gary Snyder (1990) states, "we seek the balance between cosmopolitan pluralism and deep local consciousness. We are asking how the whole human race can regain self-determination in place after centuries of having been disenfranchised by hierarchy and/or centralized power" (p. 42). Conversely, the cosmopolitan tradition has maintained, since the Stoic philosophers, that being a citizen of the world *does not* mean renouncing local identity (Nussbaum, 2010). Political theorist Danielle Archibugi (2010) contends that cosmopolitan democracy requires an increase in local governmental powers and Gerard Delanty (2012) states that, "cosmopolitanism concerns a dynamic relation between the local and the global….[and] the multiple ways the local and national is redefined as a result of interaction with the global" (p. 68).

This paper argues that localism and cosmopolitanism need to be integrated to address their respective limitations. Furthermore, each discourse addresses concepts that are relevant to the other. Under the overarching themes of resilience and reinhabitation, localism poses questions about needs, place, and community that are relevant to the issue of the collective human presence on the planet. Cosmopolitanism poses questions about our common humanity and cohabitation of the planet, about the meaning of otherness and openness, and about the co-evolution of cultures; the answers to all of these will help shape localized lifestyles.

From the perspective of Transition Design, the wicked problems it seeks to address are systemic and multi-level and their global, regional, and local impacts are inextricably entangled. Furthermore, the design and development of vibrant, localist, place-based lifestyles will be impossible without coordinated (designed) interregional and planetary exchanges of culture, knowledge, technology, and resources. However, Transition Designers and activists cannot hope to challenge globalization effectively through national and international organizations whose knowledge of localities over which they preside is minimal and disconnected from place. A conceptual framework that integrates cosmopolitanism and localism and provides a rationale for developing solutions that address both cosmopolitan and local concerns is needed.

Cosmopolitan Localism and Cultural Diversity

Wolfgang Sachs (1999) coined the term Cosmopolitan Localism in the 1990s not only to address ecological catastrophe but to challenge "cultural evaporation" (Sachs, 1999, p. 94) –the loss of many different ways of being human in world– caused by globalization. Whilst rejecting the Enlightenment project of the unification of humanity through reason, he proposed that the first photos of the earth from space demonstrated that national boundaries are intellectual constructs. The photo of the "blue marble" symbolized not merely our common humanity, but more importantly, the ecological (or biophysical) unity of the planet; the connection between the local and global.

He argued that it is necessary to allow each culture to actualize its "particular image of a good society" (Sachs, 1999, p. 107) and that this should unfold in ways that do not undermine other localized *good societies* or the possibility of planetary cohabitation. The responsibility for the biophysical well-being of the planet, Sachs argues, should not be handed to bureaucratic and technocratic eco-management regimes, which would create a new kind of decontextualized and place-less socio-political system that will further erode the diversity and autonomy of local cultures. Rather, the biophysical integrity of the planet would be the mutual responsibility of localized communities, even as they each they develop rich, self-determined, and place-specific lifestyles.

Sachs' version of Cosmopolitan Localism integrates the differing agendas of cosmopolitanism and localism. He makes a localist case for self-creating, autonomous, and place-specific cultures and societies. But also, in his analysis of the catastrophic loss of cultural diversity, decline of Otherness, and need for self-organized –rather than externally driven– societal development, Sachs articulates the contemporary, post-universalist, cosmopolitan imaginary. While he is wary of appeals to the unity of humanity (that have historically steered us into a globalized monoculture), his argument for biophysical unity suggests that the Other should include non-human beings that cosmopolitanism has overlooked, but which constitute the fabric of the planet's ecosystem.

Cosmopolitan Localism and Socio-Technical Networks

A networked society is a prerequisite for the realization of Cosmopolitan Localism, but Sachs' conceptualization pre-dates this emerging phenomenon. It is perhaps because of this that there has been relatively little discussion about how Cosmopolitan Localism might work in practice. Since the 1990s, only a handful of papers have been written on Cosmopolitan Localism (Manzini, 2011; Mignolo, 2011; Ramos, 2017; Tonkinwise, 2015). Most recent explorations of the topic have maintained that localization cannot be robust or innovative enough to effectively challenge globalization, but that connectivity and networks have opened up possibilities for new relaitonships between the local and the global. For example, international information and communication networks and small-scale and flexible manufacturing, energy, and other technologies can now be combined with localized food production to form decentralized and distributed socio-technical systems. By combining localized import-substitution and regional and planet-wide networking, wherein knowl-

edge and innovation is shared between communities, new kinds of socio-technical systems could become the foundation for more self-reliant and circular place-based economies.
This perspective has developed in particular within the context of the peer-to-peer (P2P) movement and the related vision of a commons-based civilization. P2P activists Michel Bauwens and Franco Iacomella (2012) argue that the commons should not only include our tangible natural heritage and resources but also what is intangible –design, culture, software, and science– and has been created through "collective social innovation"(p. 324). Although theoretically, such knowledge can be shared easily, various intellectual property rights impede the process. When free exchange is possible, P2P networks, can become "hyperproductive…[allowing the]…rapid sharing of innovation and very low cost mutual coordination on a global scale…[drawing on]…rapidly established quick connections between emerging and valuable expertise" (Bauwens & Iacomella. 2012, p. 325). Progress towards a cosmopolitan localist society organized around networks of communities that share knowledge, among other things, is going to be contingent on the extent to which knowledge becomes part of the commons.
Designer Ezio Manzini (2011) has proposed a small, local, open, and connected (SLOC) scenario. This describes a distributed production and consumption system that could become a new kind of socio-technical infrastructure, that would serve a cosmopolitan localist society. SLOC would allow communities to develop local self-managed economies and lifestyles wherein manufacturing and agricultural production would be largely for local consumption. Such local communities would be globally networked for the exchange and sharing of knowledge and resources (when appropriate). Of particular interest in the SLOC scenario is Manzini's (2011) distinction between long and short networks, "the short networks generate and regenerate the local social and economic fabric, whilst the long networks connect a particular place and community to the rest of the world" (p. 217). Thus, a cosmopolitan localist society would be characterized by tapestries of densely localized networks with communities as its nodes. These dense local and regional networks would be embedded or nested in more extensive and looser global networks. By contrast, globalization only creates networks designed to connect centers of production and consumption that are usually separated by great distances and that often undermine local networks in the process.
The rapid spread of communication and information networks combined with the development of flexible and small-scale technologies and the emerging possibilities for distributed production and consumption make Sachs' vision of a cosmopolitan localist society much easier to imagine. It is now possible to see how different cultural images of the good life on different parts of the planet can be actualized: not in isolation, but *in relationship with each other.*
However, Cosmopolitan Localism has left several key ideas under-defined. In order for it to serve as a vision of a future society, these need to be more clearly conceptualized. Concepts like *the local*, *lifestyle*, *needs*, *place*, *community*, *networks*, and *connectedness* need to be brought into focus, and their interrelatedness better understood. This needs to be done in ways that helps Transition Designers and others understand the origins of wicked problems, and that assists and guides interventions that help restore the social and ecological fabric at a local and global level. The question is, can a more defined vision that offers an

approach that is applicable to many different locales be compatible with localized cultural, social, and lifestyle diversity?

Cosmopolitan Localism, Needs, and Everyday Life

At its core, localism is about enabling communities to satisfy as many of their needs as is practical, in ways that optimize quality of life rather than maximize consumption. Assuming that human needs are infinite, conventional economics maintains that consumption is the route to societal well-being and it tends to ignore non-material and intangible needs that are essential for high-quality lifestyles (Max-Neef, 1991). By addressing the shortcomings of conventional economics, development economist Manfred Max-Neef has developed an approach to understanding needs relevant to the theory of localization. Because the manner in which communities satisfy their needs determines the shape of their lifestyles and everyday lives, Max-Neef's approach can become the basis for a cosmopolitan localist vision.

Max-Neef (1991) argues that needs are finite rather than infinite. It is postulated that there are ten core human needs: subsistence, affection, freedom, understanding, security, identity, creation, protection, participation, and transcendence. Poverty is defined as the inadequate satisfaction of any of these needs, not just material, subsistence needs. While subsistence must be adequately satisfied before other needs can be addressed, these core needs are systemically interrelated and not ranked by importance. Although the specific needs identified may be contentious (and some needs may remain unidentified) this does not detract from the basic argument that there are finite number of needs, and that it is necessary to distinguish between needs and how they are satisfied.

Whilst the needs postulated by Max-Neef are universal, they are *satisfied* in myriad ways according to era, culture, and place; while the number of needs is limited, the ways in which they can be satisfied is infinite (Max-Neef, 1991). For example, a satisfier for the need for food (subsistence) may be to shop at a supermarket or a farmer's market, or may be to work on a smallholding; a satisfier for the need for understanding may be to attend university, fix a car, or read a newspaper. Some of these satisfiers will be effective and some will be inadequate. Max-Neef (1991) refer to the latter as "pseudo-satisfiers" (p. 31). Some satisfiers are "endogenous," controlled from within a community, and some are "exogenous," that is, externally controlled (Max-Neef, 1991, p. 34).

"Synergistic satisfiers" (Max-Neef, 1991, p. 34) are satisfiers that are designed to simultaneously satisfy several needs in an integrated manner. For example, traditional agricultural practices may be very social and cooperative, and therefore act as satisfiers not only for subsistence, but also for affection, participation, and security. In contrast, industrialized agriculture aims only to satisfy the subsistence need, to maximize efficiency, whilst ignoring other needs. Moreover, it is likely that the satisfiers generated by industrial agriculture are pseudo-satisfiers, as they are generic rather than place-specific; centrally designed, created and controlled; and intended to maximize corporate profit, rather than quality of life. In short, in terms of their quality and synergies, the most effective satisfiers are likely to be endogenous rather than exogenous.

Through the Max-Neefian lens, localization can be defined as community based control of satisfiers of material and non-material needs. To the degree that such control exists, communities are empowered to be self-organizing and self-determining; they would be able (to paraphrase Sachs) to actualize their own image of the good life. Control over satisfiers and the ability to create synergies between them, would enable communities to satisfy their needs in place-based ways that are tailored to specific cultures and ecosystems. In industrial-capitalist societies, most satisfiers have been appropriated by large centralizing institutions such as multi-national corporations and the nation-state. Food production and distribution (subsistence) is controlled by agribusiness; the political process (freedom, participation) and the law, police, and military (security, freedom) are controlled by national governments; and the media (understanding, freedom) is controlled by conglomerates. Most satisfiers produced by such institutions will fail to adequately satisfy a given need: they are pseudo-satisfiers. The centralization of satisfiers destroys local autonomy and undermines communities' ability to self-organize. Transition town activists would argue that this causes communities to lose their resilience (Lewis & Conaty, 2012). Because satisfiers in contemporary society are usually centrally designed, created, and controlled and are intended to meet needs irrespective of specific social, cultural, or ecological contexts, everyday life and lifestyles become generic and homogenized. If bioregionalists argue for reinhabitation (Berg & Dasmann, 1990), the process through which need satisfaction is centralized might be described as *disinhabitation*.

However, the spread of information and communication networks, small-scale technologies, and distributed production and consumption systems, means that the potential now exists for communities to challenge the centralization of satisfiers. It is possible to imagine scenarios in which satisfiers (energy, food, manufacturing, building, transport, health, education, etc.) for multiple needs (subsistence, understanding, participation, freedom, etc.) are decentralized and controlled by the communities that use them. Furthermore, distributed and decentralized socio-technical systems could give locally-based need satisfaction a cosmopolitan dimension by allowing some satisfiers to be designed and managed from within local communities but also to be distributed through coordinated networks across the planet.

Cosmopolitan Localism and the Domains of Everyday Life

As Manzini (2011) suggests, a cosmopolitan localist society would be comprised of networks with differing degrees of density and connectivity: the local would be comprised of dense and highly connected networks and the global of thin and loosely connected networks. From the Max-Neefian perspective, these are spun out of the myriad everyday activities that occur as people strive to satisfy their needs: these networks of everyday life represent dynamic relationships between people, the natural world (ecosystems), and the designed and built world (Kossoff, 2011; Kossoff, Irwin, & Tonkinwise, 2015). *The quality of these networks of everyday life is a reflection of the quality of satisfiers from which they are derived*; it is likely that where these networks originate from pseudo, exogenous, and non-

synergistic satisfiers, everyday life will be much less vital and cohesive than those created from genuine, endogenous, and synergistic satisfiers (Max-Neef, 1991).

Networks of everyday of life (the relationships between people, nature, and the designed and built world) can be vitalized or degraded depending on how needs are satisfied. This can be demonstrated by taking a simple example of satisfying the subsistence need for food. If a family satisfies this need by going to a fast-food restaurant, it will reinforce the extensive and global supply-chain networks generated by agribusiness, transportation, and fossil fuel industries (Ritzer, 2010). It will also reinforce the many commodified and usually exploitative relationships that involve both people and ecosystems at a local and global level (Cavanagh & Mander, 2004). In addition, because the fast food satisfier is designed purely for profit and efficiency (Ritzer, 2012), there will be no synergies with satisfiers for other needs such as affection and participation (Max-Neef, 1991). In short, the trip to the fast food restaurant will damage networks that comprise the social and ecological fabric (ecosystems) not only of the locality, but the planet as a whole.

By contrast, the family may satisfy its need for food by going to a neighborhood cooperative restaurant. In this case, the satisfiers would likely be high quality and synergistic, in the form of good food (subsistence) in a pleasant social environment (affection) that engages with the local community (participation). Further, if the restaurant is supplied by local, organic smallholdings, this form of need satisfaction will contribute to the satisfaction of needs of people residing in the surrounding region and to the creation of vital regional social and ecological networks. If organic-farming skills were acquired through shared knowledge from global networks of farmers, this form of need satisfaction will also contribute to the development of vital planetary social and ecological networks. In the case of the fast-food restaurant, satisfiers are exogenous (controlled from outside of the community); in the case of the neighborhood cooperative restaurant, satisfiers are endogenous (controlled from within the community): the former damages the relationships between people, nature, and the designed and built world; the latter strengthens them.

The satisfaction of needs not only creates networks of everyday life (whether these are of a high or low quality) but it does so at different levels of scale. In the example above, various kinds of satisfiers are implicated at the level of the household, neighborhood, region, and planet. The family could have chosen to cook, eat and grow some food at home, in which case they would (hopefully) strengthen the network of relationships at the household level; or they could have chosen to eat a picnic in a municipal park, in which case they would strengthen the network of relationships at the city level.

Six levels of scale of everyday life have been alluded to: the household, neighborhood, city, region, and planet, within which multiple needs –subsistence (food, shelter, and clothing), identity, affection, understanding, freedom, protection, among others– can be satisfied. In as far as this process is endogenous and synergistic, it gives rise to what social ecologist Gideon Kossoff has called the Domains of Everyday Life, that is, self-organizing and nested networks of networks through which material and non-material needs are satisfied (Kossoff, 2011). The boundaries between these Domains are defined by the shift between different ways of satisfying needs within them: typical satisfiers at the household level differ considerably from those at the neighborhood level, which in turn will differ from those at the city level and from those at the regional level. This gives rise to different and

distinct forms of everyday life at each of its levels of scale. Each represents a different kind of community with its own identity, potentialities and challenges (Kossoff, 2011; Kossoff et al., 2015).

To the degree that households, neighborhoods, cities and regions control the satisfaction of the needs generated within them, they become autonomous, self-determining and self-organizing entities. This is the Cosmopolitan Localist scenario: the Domains of Everyday Life would be both internally networked –as people satisfy their needs within them– and externally networked, since needs within any single Domain could not be satisfied in isolation from other Domains: no household, neighborhood, city or region can be entirely self-sufficient and they therefore will always need to be connected to other households, neighborhoods, cities and regions. This would be a decentralized and non-hierarchically organized system in which social, economic and political power is distributed throughout rather than concentrated in particular places. The symbiotic and multidirectional connectivity of everyday life would be the basis for a cosmopolitan localist society, a planetary network of culturally diverse and self-organized communities.

With industrial-capitalism, however, and particularly with globalization, communities have lost control of the need-satisfaction process: the creation of satisfiers has become highly centralized and therefore the place-based and need satisfying networks of everyday life that enable communities and local economies to flourish are degraded: household, neighborhood, city and region lose their cohesiveness and vitality. The Domains are hollowed out and begin to disintegrate, and the quality of everyday life is correspondingly diminished. To return to the example above, consuming fast food undermines the quality of relationships of everyday life at all of the levels in which it is implicated. Instead of helping to develop networks comprised of high-quality relationships, as is the case with the cooperative restaurant, the fast food outlet contributes to thin networks of low quality relationships both within the Domains of Everyday Life in its locality, and in other localities that are connected to it through the global system.

The loss of the social and ecological fabric that results from the disintegration of the Domains gives rise to many wicked problems that Transition Design seeks to address. Fast food, to use this example again, is connected to myriad such problems: obesity, pollution, topsoil and biodiversity loss, deforestation, water shortages, climate change, and inequity, among others. All can be traced back, at least in part, to the loss of control over the satisfaction of needs by place-based communities and to the consequent deterioration of the quality of everyday life at multiple levels of scale.

The Vision of Cosmopolitan Localism

The conceptual framework of the Domains of Everyday Life helps define a cosmopolitan localist vision of multi-scalar, or nested, networks of self-organizing, semi-autonomous, and place-based communities that are empowered to create the good life in the image of their own cultures and histories. The challenge of Transition Design is to help restore and reinvent households, neighborhoods, cities, and regions, by enabling their inhabitants to recover control over the satisfaction of their needs and by redesigning satisfiers so that

they are synergistic and placed-based. This, in turn, requires the redesign of socio-technical systems, so that they become decentralized, distributed and networked.

This vision responds to many themes within localism, cosmopolitanism and Cosmopolitan Localism that need further development. A number of concepts frequently used in these discourses (community, locality, place, lifestyle, networks, needs, reinhabitation, resilience) are clarified and become more nuanced. It addresses the question, posed by localism, of how to conceptualize needs. As people strive to satisfy their needs in different ways, they come to create different *kinds of* community, different *kinds of* localness, different *kinds of* place, different *kinds of* lifestyles and different *kinds of* networks. These differences correspond to the nested levels of scale of everyday life –household, neighborhood, city, region– at which needs are satisfied in different ways. Also, the concepts of resilience and reinhabitation can be applied with increased focus: each level of scale of everyday life needs to become more resilient and each needs to be reinhabited.

The emphasis on the development of vital networks of everyday life, within and between communities, and the fostering of mutually supportive, diverse, place-based lifestyles and cultures, is an expression of the relational ontology that is at the heart of the contemporary cosmopolitan imaginary. Networking between households, neighborhoods, cities and regions would enable the sharing of skills, knowledge and, where appropriate, resources, and would give everyday life a cosmopolitan dimension. Finally, this vision proposes a complex, multi-level and multi-directional networking process that connects the local (Domains of household, neighborhood, city, and region) to the global (the planet), which is the essence of Cosmopolitan Localism.

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Resumen: La globalización está en la raíz de muchos problemas perversos en los que el localismo ha sido una respuesta común. Sin embargo, tales problemas suelen ser demasiado complejos e interconectados para ser resueltos al nivel de lo local. Además, si los estilos de vida futuros, basados en el lugar, y propugnados por el Diseño para la Transición han de ser de alta calidad, será necesario desarrollar formas de vida cotidiana auto-organizadas y conectadas a múltiples escalas: desde los hogares a los barrios, las ciudades, las regiones, y el planeta. Esta conexión simbiótica entre los diferentes niveles de la escala de la vida cotidiana, de lo local, al planeta como un todo, integraría dos tradiciones antiguas y distintas –cosmopolitismo y localismo– y sería la base para un nuevo tipo de asentamiento social, cultural, político y económico, el Localismo Cosmopolita.

Palabras clave: Globalización - redes - localismo - Localismo Cosmopolita - cosmopolitismo - auto-organización - problemas perversos o intrincados - estilos de vida - vida cotidiana - Diseño para la Transición.

Resumo: A globalização está na raiz de muitos problemas perversos nos quais o localismo tem sido uma resposta comum. No entanto, tais problemas costumam ser complexos e interconectados para ser resolvidos ao nível local. Além, se os estilos de vida futuros, baseados no lugar, e propugnados pelo Design para a Transição serão de alta qualidade. Será necessário desenvolver formas de vida cotidiana auto organizadas e conectadas a múltiplas escalas: desde os lares aos bairros, as cidades, as regiões e o planeta. Esta conexão simbiótica entre os diferentes níveis da escala da vida cotidiana, do local, ao planeta como um todo, integraria dois tradicionais antigas e diferentes –cosmopolitismo e localismo– e seria a base para um novo tipo de assentamento social, cultural, político e econômico, o Localismo Cosmopolita.

Palavras chave: globalização - localismo - localismo cosmopolita - cosmopolitismo - auto organização - problemas perversos ou intrincados, estilos de vida, vida cotidiana - design para a transição.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Postcards From "the Edge": Toward Futures of Design for Sustainability Transitions

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Abstract: The design for sustainability field has evolved considerably over the past few decades. Its early beginnings were marked by addressing single issues in isolation, with a primarily technologically optimistic predisposition and a focus on incremental product innovation. Currently, "the edge" of the field strategically deals with systemic issues in the longer term, with a focus on human and ecosystem well-being. This evolution has been aligned with and partly influenced by the emergence of sustainability science, and system innovations and transitions theories, as well as scientific advancement pointing to the increasing urgency of action. This article presents an overview of the emergence of Transition Design, discusses the current status of theory and practice, and provides pointers for the theoretical and practical advancement of the field.

Key words: design for sustainability - sustainable design - sustainability - transitions - design - Transition Design.

[Abstracts in spanish and portuguese at page 84]

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Introduction: The Winds That Pushed Design for Sustainability to "the Edge"

Although the history of "the environmental turn" in academic circles dates as far back as the mid-twentieth century (and is often associated with the publication of *Silent Spring* by Rachel Carson in 1962), the twenty-first century in particular has witnessed significant developments be made in both theory and practice. These developments have also

influenced the field of design for sustainability (DfS), challenging its fundamental theories, rules of thumb, tools, and methods, and have pushed it to the "edge". The first of these developments was the emergence and development of sustainability science as a solution-oriented transdiscipline, bringing the natural and social sciences together (Kates et al., 2001; Clark & Dickson, 2003; Kates, 2011; Lang et al., 2012; Miller et al., 2014). The key implication of sustainability science has been unleashing the realization that environmental problems cannot be understood or addressed in isolation; rather, they are part of a complex whole and are tightly connected to social problems, with the two together mutually reinforcing the other. Related to this is the conceptualization of sustainability as a property of systems and not of individual system components (Clayton & Radcliffe, 1996; Faber et al., 2005), and as a "moving target" shaped by its temporal and spatial context, rather than as a static, fit-for-all, idealized endpoint (Hjorth & Bagheri, 2006). This dynamic, context-dependent conceptualization of sustainability implies that goal-based optimization approaches are not suitable for endeavors aiming at sustainability, and instead, that process-based, multi-scale, and systemic approaches guided by visions are needed (Bagheri & Hjorth, 2007). Recently, sustainability science has been defined as a science of "what could be," and, with references to Herbert Simon's work (Simon, 1996), a "science of design" (Miller, 2015), thereby suggesting that there are epistemological and methodological parallels in these two fields that have yet to be elaborated.

The second of these developments is the emergence and maturation of the system innovations and transitions field. System innovations are defined as transitions from one socio-technical system to another (Geels, 2005); therefore, it is common that system innovations and transitions are grouped together, and the terms are interchangeably used. Stemming from science and technology studies, particularly based on co-evolutionary theories of innovation, the beginnings of this field can be traced back to the Dutch National Inter-Ministerial Programme for Sustainable Technology Development which took place between 1993 and 2001 (Weaver et al., 2000). The two main works that set the theoretical foundations of this field were the doctoral theses and subsequent publications of Geels (2002, 2005) and Loorbach (2007, 2010). Geels, based on earlier works of several scholars (Kemp, 1994; Van den Ende & Kemp, 1999; Kemp, Rip & Schot, 2001), has further developed and refined what is known as the multi-level perspective of system innovations (MLP). It would not be an exaggeration to state that MLP is the most commonly used theoretical model and analytical tool in the field. MLP explains system innovations and transitions with references to three dynamically interactive levels: i.e., the landscape level at the top, the socio-technical regime level in the middle, and niche innovations at the bottom level of a nested hierarchy. According to the MLP, stability increases and the rate of change decreases towards the upper levels of the socio-technical system, but the depth and influence of change increases towards the lower levels. The niche innovation's level is particularly important as this is where the novelties initially emerge from the dynamics of the socio-technical regime, later putting pressure on it.

Loorbach (2007, 2010) developed the transition management approach as a new mode of governance for sustainable development building on MLP and another well-known theoretical model, that is, the multi-phase model of transitions. The multi-phase model (Rotmans et al., 2000) presupposes that transition processes go through a pre-development

phase (no visible change, but a lot of experimentation takes place at the niche level), a take-off phase (the system starts to shift), an acceleration phase (visible structural changes occur), and a stabilization phase (a new dynamic equilibrium is reached). According to the transition management framework (Loorbach, 2010), three interrelated activities are required to achieve system innovations: 1) strategic activities to form long-term visions that will lead to changes in the culture and structure of a socio-technical system; 2) tactical activities that are directed at implementing a transition agenda within the actor-network towards the vision; and 3) operational activities that consist of experiments and learning-by-doing at the niche level. The niche level is of course especially relevant for DfS, particularly for design for social innovation which is about identifying, triggering, and facilitating these experimental opportunities (Hillgren, Seravalli, & Emilson, 2011; Manzini, 2007, 2014). Nevertheless, recent developments in design becoming active in policy development and governmental processes (Junginger, 2013; Kimbell & Bailey, 2017) suggests that it could also be productively involved in the strategic and operational activities of transition management. Recently, Gaziulusoy and Ryan (2017) have argued that transitions are creative, technical, and political design challenges that require imagining new systems, evaluating system concepts, and developing those that are promising, along with designing participatory deliberation processes to attend to the political nature of transitions.

The third development is the increasing sense of urgency for action underlined by studies on the integrity of earth systems and social foundations for justice and equity. For example, the now disbanded advisory body to Australian government's Climate Commission argued that we are in "the critical decade"; a decade in which our decisions and actions on climate change will determine the success or failure of transitions to the low-carbon future that is necessary to avoid severe implications for global society (Climate Commission, 2011). A group of scientists at the Stockholm Resilience Centre studied earth systems over several years and developed the "planetary boundaries" framework (Rockström et al., 2009; Steffen et al., 2015). This framework set out precautionary boundaries –a safe operating space– for nine critical processes of human-driven environmental change. Beyond these boundaries, we all face the possibility of abrupt, large-scale changes in the functioning of the earth's systems and significant risks to societies and economies worldwide. According to this framework, currently two out of nine boundaries have been severely breached, posing a high risk, two of them have been breached, posing increasing risk, and two boundaries have yet to be quantified. Raworth (2012) developed the concept of social boundaries to complement the planetary boundaries framework and argued for a "safe and just operating space", which lies between the environmental ceiling and social foundations. She demonstrated through illustrative indicators that humanity is currently falling below this social foundation on every dimension for which data are available. These and numerous other studies triggered the acknowledgment of an urgent need for a radical and transformative restructuring of the socio-technical systems that meet our needs (Ryan, 2013). These transformations cover institutional, social/cultural, organizational, as well as technological, change (Loorbach, 2010); that is, they need to take place at the societal level. Based on this contextual background, this article aims to present "the edge" of DfS theory and practice that is influenced by these developments and their implications. The next section provides a brief historical overview of the emergence of design for system innova-

tions and transitions, or Transition Design. This is followed by a detailed exploration of the current frontiers of this emerging area in theory and practice. The article is completed with "postcards from the edge"; short notes, reflections, and questions about the possible futures of this emerging field.

A Short History of "the Edge"

According to a recent account by Ceschin and Gaziulusoy (2016) on the evolution of design for sustainability (DfS) over the two decades following its inception, the field has shifted its focus from addressing single issues in the short term at the artifactual level to tackling systemic issues at the societal level with a long-term outlook. In other words, DfS has moved from a palliative position to one that is strategic, thereby enlarging its scope both in terms of timeframes and in reference to the complexity of problem and solution contexts. Ceschin and Gaziulusoy have explained their findings by referring to the theoretical developments made in the intersection of design and socio-environmental issues, as well as the established links to broader contextual developments. They have positioned design for system innovations and transitions at the socio-technical innovation level (the other levels are product innovation, product–service system innovation, and spatio-social innovation) of the evolutionary framework that they developed.

Gaziulusoy (2015) identified five criteria as being necessary for design and innovation approaches to contribute to sustainability transitions: 1) adopting a strong sustainability approach; 2) systems thinking; 3) radicalism; 4) long-term orientation; and 5) mindset change. So far, four main theoretical contributions have met these criteria to varying degrees. They are also positioned in Gaziulusoy and Ceschin's evolutionary framework at the socio-technical innovation level. Three of these were the doctoral theses of Gaziulusoy (2010), Joore (2010), and Ceschin (2012), and the fourth was detailed in the recent contributions of Irwin (2015a) and Irwin, Tonkinwise, and Kossoff (2013, 2015). The locations of these contributions –New Zealand, The Netherlands, Italy, and the USA– are worth noting here to highlight that the emergence of this thinking has been distributed geographically.

Gaziulusoy's (2010) work was situated at the intersection of sustainability science, system innovations and transitions theories, and design theory. She developed a theoretical framework and an operational tool for the use of design and innovation teams to align their day-to-day decisions and strategic outlooks with unfolding and upcoming sustainability transitions. The theoretical framework and operational tool have been articulated in detail in her doctoral thesis and summarized in subsequent publications (Gaziulusoy, Boyle, & McDowall, 2013; Gaziulusoy & Brezet, 2015). She developed a three-dimensional systemic framework integrating MLP (Geels, 2005) with four design innovation stages for sustainability (Brezet, 1997), and argued for extending the timeframes used for strategic decision making in businesses as a necessity for design and innovation teams to be able to respond to and participate in sustainability transitions. In Gaziulusoy's (2010) theoretical framework, company strategy plays an intermediary role in translating diffuse, long-term, societal-level visions of sustainability into concrete decisions at the design level in the short term.

Similarly, company strategy plays an intermediary role for the design level to take part in societal-level vision making. The operational tool that Gaziulusoy (2010) developed based on this theoretical framework –a scenario method– integrated explorative and backcasting scenario approaches in order to causally link the present reality to future aspirations.
Joore (2010), on the other hand, situated his work tightly within industrial design engineering, exploring the mutual influence of new products and societal change processes. With references to MLP (Geels, 2005), he developed a multi-level design model to assist in this exploration. Joore (2010) argued that new products must make a contribution to the realization of societal-level visions, and that this influence would especially be relevant if these new products fulfill a function (in the envisioned, new, socio-technical configurations) that cannot be fulfilled in another way. Both Gaziulusoy (2010) and Joore (2010) place an emphasis on functional innovation as a means of opening up design processes for radical innovation. Joore has framed functional innovation by making references to product-service systems (PSS), whereas Gaziulusoy (2010) used a broader frame, including the societal function fulfilled by the organization.
Ceschin (2012) situated his work within the maturing research area of sustainable product-service systems (SPSS) and argued that SPSS can be considered system innovations because they require changes in user practices, organizational structures, regulatory frameworks, and culture. Based on this positioning, his project focused on exploring socio-technical experiments as strategic tools for promoting SPSS during their introduction and scaling up. He defined socio-technical experiments as a partially protected environment in which a broad network of actors can learn and explore how to incubate and improve radical innovations and how to contribute to their societal embedding. This way, Ceschin (2012) has positioned SPSS development and scaling up in the context of system innovations and transitions. Similar to Gaziulusoy (2010), Ceschin developed (2012) a tool for practicing designers.
While these three Ph.D. projects were the first large bodies of work theorizing about system innovations and transitions from the perspective of design, it was Irwin and her colleagues at Carnegie Mellon University's School of Design who coined the term "Transition Design" within the wider design community as an emerging field of design education, research, and practice (Irwin et al., 2013, 2015; Irwin, 2015a). Transition Design, in addition to and before being influenced by system innovation and transitions theories, had its foundations in the complex systems theories and a wide array of theories of change. According to the framework proposed by Irwin (2015a), there are four mutually reinforcing elements of Transition Design: vision, theories of change, mindset/posture, and new ways of designing. This framework had begun to be developed several years before appearing explicitly in publications, and it informed the redesign of Carnegie Mellon University's School of Design's curriculum (Irwin, 2015b).

Current Frontiers of "the Edge"

The previous sections have provided an outline of developments in our understanding of sustainability and the dynamics of transitions that influenced the emergence of Transition

Design, and they outlined a summary of this emerging field's brief history since 2010. But what, or where, is "the edge" at present? This section explores these questions by taking a deeper look at theory and practice.

Transitions *to* What?

Transitions, in the sense adopted within this emerging field, are transformations with an explicit directionality towards sustainability at the societal level. Therefore, the first exploration here is how the main theoretical contributions outlined in the previous section frame this direction. Common to all of the work cited is an emphasis on long-term and systemic orientation that is aligned with transitions as long-term processes.

Gaziulusoy (2010) discusses the conceptual groundings of sustainability in detail, favoring the strong sustainability model (irreversible hierarchies between environment, society, and economy, and limited or no substitution of environmental capital with social or economic capital) over the weak sustainability model (environment, society and economy are non-hierarchically related, substitution of capital is possible, often favoring economy over environment and society) as a baseline. She does not argue for a definitive measure or characterization of sustainability. Instead, by making references to theories of ecological economics, she points out that sustainability can only be defined through references to the nominal lifespan of what is to be sustained, and that it is not possible to assess sustainability before the end of the nominal lifespan of what is under consideration. She places an emphasis on the use of a precautionary principle with warnings about the unintended consequences of over- or under-precautionary approaches. Because of the relativity and unknowability of what is sustainable across system levels and over time, she argues in favor of searching for societal-level visions of sustainability and referencing actions at different levels of the socio-technical systems to these large-scale, long-term visions. She also highlights that sustainability cannot be a static measure, and that as the system conditions change and our relative understanding of the systems increase, the adopted vision needs to be adjusted. This dynamic framing implies that visions can only be anchors to direct and, when necessary, to readjust the direction of actions, and cannot be taken as blueprints or absolute framings of sustainable societies. In her theoretical framework, visions are emergent properties generated through direct or indirect contributions of societal system actors; they are somewhat elusive, diverse, and their scale depends on the system level from which they emerged, however, their content needs to reflect an alignment with societal-level visions.

In line with this relative and dynamic framing of sustainability and its emphasis on the different system levels from which visions may emerge, Gaziulusoy (2010) turns to concepts and calculations that are relevant to her research scope, that is production–consumption systems. She argues that as the eco-efficiency requirements that are calculated as necessary for production-consumption systems to be sustainable cannot be achieved within existing socio-technical systems, and since eco-efficiency as a measure of sustainability is insufficient for it lacks any reference to social issues, radical transformations are necessary at the societal level. Ceschin (2012), on the other hand, is less investigative of the foundations. Without engaging in a detailed conceptual exploration of sustainability, he refers instead

to some early attempts at quantifying the required reduction in consumption levels and states that resource consumption should be reduced by at least 90% in industrial contexts in order to consider a socio-technical system as sustainable. He acknowledges that these estimates are approximate; nonetheless, he argues that they validate the need for a radical transformation of our current development model. Joore (2010) is even more succinct. He cites earlier work which argued for a need to transform complex systems to achieve sustainability, and adopts this position as a starting point for his exploration of the relationship between new products and societal change processes.

Contrary to the works cited in the previous paragraph, Irwin (2015a) and Irwin et al. (2013, 2015) are not explicitly or directly concerned with production-consumption systems. Therefore, what is required for sustainability is not discussed in their work with references to concepts that are predominantly relevant for these systems, such as eco-efficiency. Instead of discussing sustainability from a resource point of view, they emphasize lifestyles. A sustainable lifestyle, according to them (with references to earlier work), is based on the principle of meeting needs through the local and regional production of hard goods and the global production and sharing of soft goods. They explicitly point out that a sustainable lifestyle is one in which communities have symbiotic relationships with their environment, and that design should acknowledge the natural world as the greater context for design practice, thus implicitly adopting the strong sustainability model as advocated by Gaziulusoy (2010).

Transitions *of* What?

All of the work cited here essentially argues for the necessity of societal level transformation, albeit by choosing different "functional units" and "operational contexts" on which to focus. While Gaziulusoy (2010), Joore (2010), and Ceschin (2012) predominantly situate their theoretical frameworks in the context of product development and business, with a focus on production-consumption systems, Irwin's (2015a) and Irwin et al.'s (2013, 2015) framework focuses on lifestyles at the individual and community levels. In Gaziulusoy's (2010) framework, there is an emphasis on companies and their design and innovation teams aligning their strategies, decisions, and actions with societal-level sustainability visions. The whole theoretical framework revolves around establishing this connection through a systemic and temporal staging, which situates societal visions in the long term, company strategy in the medium term, and product development in the short term. She provides details on how design and innovation teams can contribute to societal-level transformations, or socio-technical transitions, at the product development level.

Although the need for societal-level transformation and mutual influence between products, product-service systems, and societal change processes are acknowledged in Joore (2010) and Ceschin (2012), *how* design in product development can purposefully influence change processes at the societal level is not explained theoretically in much detail. Instead, in Joore (2010), new products are framed as potential enablers of transitions, and transitions are assumed to result in the development of new products that are reflective of the characteristics of the new or emergent socio-technical system. In Ceschin (2012), who (similar to Gaziulusoy) acknowledged different temporal frames relevant for design,

a prescription was made for designers to widen their temporal outlook and broaden their design scope to cover the design of transition paths without elaborating on how they can also take part in the generation of societal-level visions.

Irwin (2015a) and Irwin et al. (2015), however, place Transition Design at the end of a design continuum, arguing that Transition Design that deals with the generation of sustainable lifestyle visions can inform design approaches that deal with the generation of short- and medium-term solutions. Therefore, their framework resembles the framework of Gaziulusoy (2010) in the sense that it assumes a role for designers in the generation of visions at the societal level. However, the difference is that, for Gaziulusoy (2010), design and innovation teams have an indirect influence on the generation of societal-level visions mediated through company strategy, whereas, for Irwin (2015a) and Irwin et al. (2015), Transition Design is a design activity that is directly involved in the generation of visions of sustainable lifestyles. In Gaziulusoy (2010), design as a subject of transition is implicit. Similar to design indirectly influencing societal-level visions, it is assumed that societal-level visions will influence design through the mediation of company strategy, as well. Ceschin (2012) and Joore (2010) do not deal with the questions of *if* or *how* design becomes a subject of transitions. In Irwin (2015a) and Irwin et al. (2015), design is explicitly a subject of transitions. In their framework, visions of transitions, transition knowledge, designers' mindsets and posture, and new ways of designing are four elements that are assumed to continually inform and transform one another.

Transition Design: How?

Following the elaboration of how contributions to Transition Design frame the content and subject of transitions, this section explores the tools and methods of Transition Design proposed so far. In line with her conceptual framework that grants company strategy a mediating position between the wide-scale generation of societal visions and the development of products in design teams, Gaziulusoy (2010) and Gaziulusoy et al. (2013) developed a scenario method for the use of companies. This method combines tools that are familiar to companies and design teams (organizational vision development, risk assessment, stakeholder analysis, explorative [foresight] scenarios, and product concept generation) with other (new or existing) tools with which companies and design teams are unfamiliar (development of a sustainability model, societal vision development, reflecting on organizational function within society, systems analysis, and normative [backcasting] scenarios). The method aims to trigger reflection within companies on the interrelationships between environment, society, economy, and their organization, assist them to participate in the development of visions of sustainable societies and reflect on how the organization (and consequently the outputs of the design team) should change to remain relevant in those societies, and walk them through the generation of scenario network maps (List, 2005) linking the present at the organizational and product development levels with future societal visions. The resulting scenario network maps have three layers: events, products, and stakeholders, and inform company strategy and design decisions. Gaziulusoy (2010) has developed this method iteratively, working together with three case companies by following an action research methodology.

Ceschin (2012) also developed a tool, but in contrast to Gaziulusoy (2010), who targeted companies as a whole with her method, he directly targeted designers and the design process. He combined four clusters of established and new PSS design tools. These clusters involved tools for formalizing PSS concept visions (PSS offering diagram, PSS value chain map, storyboard, PSS elements, and sustainability diagram), tools for developing and formalizing transition strategies (transition path canvas, transition path storyboard, transition path table, socio-technical experiments' design guidelines, and scaling up guidelines), tools for managing the network of actors (actor map, actors table, key issues and alternative options map, and context opportunities and barriers map), and tools for monitoring and evaluating the transition process (experiment evolution framework and scaling up evaluation framework). Ceschin (2012) has also developed, tested, and iteratively improved these sets of tools through two case study projects and a design workshop.
Although Irwin (2015a) and Irwin et al. (2013, 2015) have not developed a tool or elaborated on a specific method, it is understood that they have adopted and advocate the generic method used in system innovations and transitions projects, that is the visioning and backcasting approach. They place a significant emphasis on long-term visions as propellers of short-term projects that are rooted in new, more sustainable paradigms. Even though they do not readily provide a tool or method that can be used in Transition Design projects, their main methodological contribution to Transition Design is in fact realized through design education. The new curriculum currently being implemented at Carnegie Mellon University's School of Design (Irwin, 2015b) uses Transition Design as an overarching framework to guide design education at the bachelor, master's, and doctoral levels. This is in line with how Transition Design in their theoretical framework is also strongly linked to the transition of design, as much as it is about the design of transitions.

Transition Design in Practice

It is heartening to observe that as a field in its infancy with a history that is more or less a decade long, Transition Design has started to attract the attention of practitioners. Any evidence that can be provided here is anecdotal and based on a few personal conversations held with practitioners mainly working in the policy-making area of service design. These practitioners, by way of being assigned to service design projects (mainly by governmental bodies), have started to sense "the edge" through the temporal, procedural, and spatial limitations imposed on them by having to work for a single client under non-disclosure mandates when the issues they are commissioned to generate solutions for require larger systemic and longer term interventions than the project briefs frame, as well as opening up processes to a larger network of relevant stakeholders than they are allowed. When these practitioners are introduced to Transition Design, they realize its transformative potential at the institutional level; nonetheless, they experience difficulties in creating opportunities for and initiating Transition Design projects within the commercial environments and bureaucracies of their clients. This anecdotal evidence may in fact be pointing to growing pains in the professional environment, and there is room to hope that soon enough early adopters will emerge, presenting their projects as examples and that a "take-off" will follow.

Although Transition Design projects are yet to come in practice, it is a promising sign that designers have started to be commissioned in transition projects for strategic roles, rather than solely to work on the creation of conventional design outputs (such as visualizations and product concepts). For example, a design-led transition project in Australia commissioned a total of sixteen professional designers with backgrounds in architecture, urban design, industrial design, service design, and interaction design to facilitate visioning processes in participatory stakeholder workshops, to assist the project researchers in synthesizing knowledge from a variety of resources and expertise bases, and to develop visualized and narrated proposals for alternative, low-carbon, and resilient urban futures (Gaziulusoy & Ryan, 2017). In another project on energy transitions in Finland, value-sensitive design research and implementation was used to deal with the socio-technical complexity associated with placing solar panels on the roof of a heritage building (Mok & Hyysalo, in press).

Of course, playing roles as designers in transitions projects and being Transition Designers, although interrelated, come with nuances. Designers are already equipped with skills and knowledge that are invaluable within the context of transition projects (Gaziulusoy & Ryan, 2017); but being a Transition Designer requires skills, knowledge, and professional and personality traits that are not yet widely considered "designerly traits". Irwin (2015a) counts "mindset and posture" as one of the four core elements of a Transition Design framework. According to her, the mindset and posture required of Transition Designers cover self-reflection, inquiry into one's own value set, a willingness to transform from within, openness, holistic worldview, community centeredness, humility, ability to lead and be led, and transdisciplinary collaboration. These new designerly traits go hand-in-hand with the new attitudes, skills, and knowledge that are necessary for designers. Ceschin (2012) mentions a few of these, including broadening design scope, accommodating short-, medium- and long-term perspectives in projects, building up and working within broader networks of stakeholders, adopting an experimental and learning-based design attitude, and knowledge of how socio-technical system changes happen.

Postcards From "the Edge"

The previous section provided an overview of the current status of theory and practice in the intersection of design and sustainability transitions. In this section, thoughts on how the Transition Design field could further develop will be presented. These thoughts are formulated as short notes –with a postcard synopsis– as the aim here is not to put forward well-scrutinized arguments, but instead to highlight some comments and questions that need to be considered in the near future by theorists and practitioners of Transition Design.

Postcard I - Work in Consortiums

Potential support for the diffusion of Transition Design in practice could come from the completion of some postgraduate projects undertaken in the non-commercial, protected, and educational set-up of universities. In this regard, current master's and Ph.D. students

whose projects are building on the early work cited in the previous sections could serve as positive "Trojan horses" in the organizations they encounter throughout their studies, as well as those with whom they may work upon completion of their studies. In fact, as Transition Design projects require the generation of new knowledge through the integration of a wide array of both academic and non-academic expertise, and the creation of new policies through the involvement of large networks of stakeholders, consortiums for applied research –including academic, governmental, non-governmental, and private organizations– could be the only feasible operational model for initiating and running Transition Design projects. This brings to the fore the question of what effective mechanisms there are and should be developed further for funding and governing the work of such consortiums.

Postcard II - Advocate and Model Open Innovation Through Open Networks of Learning

There is a danger that Transition Design might become the new "design thinking"; it might be reduced to a process model and commercially exploited by "Post-it design consultancies" as yet another tool of incremental change, rather than push the boundaries of mainstream socio-ecological-technical and socio-political practices and imaginaries. Such co-option would undermine the very essence and spirit of Transition Design. This is not because Transition Design is a homogeneous or static body of theory and practice; on the contrary, evolution is an inherent characteristic of any field of knowledge, whether theoretical or practical. But, because Transition Design promotes change that has directionality towards sustainable (and just) futures achieved through the reconception of entire lifestyles (Irwin, 2015a), as well as the restructuring of entire systems of production and consumption (Ryan, 2008), any project labeled as a Transition Design project that does not include a radical rethinking of institutional and organizational models, a redesigning of socio-technical systems, or a reimagining of socio-ecological relations would result in transformative opportunities being lost. For this reason, Transition Design theory should be developed within open learning networks and any practice-relevant insights should be made immediately publicly available in a usable format. Similarly, in commercial arrangements, practitioners should readily share their Transition Design knowledge openly with their clients or in the consortiums in which they work. The practice-relevant learning generated within these arrangements on Transition Design processes should also be fed back into the body of open knowledge. Practitioners should only charge for their expertise and experience in initiating and coordinating Transition Design projects –not for the knowledge of theory and methods of Transition Design. This brings to the fore the question of how such an open network of learning and the pool of open knowledge could be organized, facilitated, and governed.

Postcard III - Do Not Lose Sight of "the Small" in a Meta-theory

Loorbach (2007) argued that transitions theory is an inclusive and flexible meta-theory that could integrate existing models and theories. This could also be considered true for Transition Design theory and the practice of Transition Design. Ceschin and Gaziulusoy

(2016), in their analysis of the historical evolution of the DfS field, presented several approaches that fall under this umbrella field as a nested hierarchy, positioning design for system innovations and transitions as the uppermost layer. Although the focus of the DfS field, in their observation, has evolved from being technology-centered and insular to being human-centered and systemic, they urged their readers to avoid drawing the conclusion that the higher levels in this hierarchy have replaced or should replace the approaches at the lower levels. Ceschin and Gaziulusoy (2016) emphasized that the approaches are complementary, rather than contrasting:

> Therefore, each DfS approach should be acknowledged for its associated strengths and shortcomings, and should be utilised in conjunction with complementary approaches for any given project following a systemic analysis, because addressing sustainability challenges requires an integrated set of DfS approaches spanning various innovation levels. Approaches that fall under the Socio-technical Innovation Level demonstrate this requirement well. Design for System Innovations and Transitions focuses on transforming systems by actively encouraging development of long-term visions for completely new systems and linking these visions to activities and strategic decisions of design and innovation teams. Achieving these visions will require design and innovation teams to use a combination of the approaches in lower levels and use in development of new technologies, products and services (Level 1), new business models (Level 2), new social practices (Level 3) that can be part of the envisioned future systems. (pp. 147-148)

It would also be interesting to investigate how some emerging DfS approaches, such as design for conviviality (Lizarralde & Tyl, in press), design for resilience (Baek, Meroni, & Manzini, 2015), and design for co-habitation (Smith, Bardzell, & Bardzell, 2017) could be supported by and contribute to the theory and practice of Transition Design. Both the established DfS approaches mentioned in Ceschin and Gaziulusoy (2016) and the emerging approaches mentioned in this paragraph are "small" approaches in the sense that their focus is either systemically narrow or thematically limited. Nevertheless, the former set can assist with achieving visions at different systemic scales and the latter set can inform visions of new systems as new ways of designing.

Postcard IV - Expand Theoretical Foundations and Discuss Implications on the Practice of Such Expansion

The foundational theories that underlie the early contributions to Transition Design cover complex adaptive systems theories, sustainability science, system innovations and transitions theories, social practice theory, and environmental ethics. These are essential theories for informing the future of design practice that can play a role in sustainability transitions. Nevertheless, this emerging field can and should also learn from other theories that are currently informing design and penetrating its comfort zone. For example, design in general should shake off the dominance of human-centeredness in theory and practice as

it is a necessary foundation, but too anthropocentric to lead design practice into the future on its own. Transition Design should develop ways to give a voice to the voiceless, both in its epistemology and methodology, as its essential aim should cover creating *just* futures as well as sustainable ones. For this purpose, design in general, and Transition Design in particular, can learn from feminist theory, animal studies, post-humanist ethnography, political ecology, and literature on decolonizing methodology. Some of this literature has been integrated into design through the contributions of pioneering work in recent years (for example, Avila, 2017; Jönsson & Lenskjold, 2014; Schalk, Kristiansson, & Mazé, 2017; Tlostanova, 2017). Further exploring the implications of this literature in design and from it derive insights and lessons for the development of Transition Design theory and practice is urgently needed.

Postcard V - Post-Transition Design: Prepare for "What if Not?" and "What is After?"
Transition Design is implicitly a project of hope; a hope that is based on the assumption that society can achieve a major transformation toward sustainability in a timely manner and following a smooth path. Nevertheless, in the broader context of academic and public sustainability discourse, hope and despair go hand in hand. This is particularly amplified in regard to climate change. For example, on the one hand, record renewable energy deployment was observed globally in 2016 (International Energy Agency, 2017); but on the other hand, emissions reduction targets that are required to reduce the risk of severe climate change have not yet been met, and the window to limit the average increase of global temperatures to between 1.5 and 2 degrees centigrade, as compared to preindustrial levels, is rapidly closing (Rafter et al., 2017; UNEP, 2017). The observable impacts of an already changed climate include the migration of animal species to higher altitudes, shrinking glaciers, loss of sea ice, more intense heat waves, and more frequent and severe extreme weather events. This begs the question: What if transitions do not happen either timely or smoothly? Some transitions may happen faster than others, depending on contextual dynamics. In some cases, they may be induced by crises, and in some other cases there may be systemic collapses. So, there is not a single type of transition and Transition Design expands its theoretical base as well as tools meant for practice by learning from several transitions typologies proposed (Berkhout, Smith, & Stirling, 2004; de Haan & Rotmans, 2007; Smith, Stirling, & Berkhout, 2005; Geels & Schot, 2007). Another question that comes to mind is what happens after the transition, when new dynamic equilibriums start to emerge? What forms can Transition Design take and how can it contribute to post-transition contexts?

Conclusions

This article presented an overview of the influencers, history, and current theory and practice of an emerging area of design of sustainability positioned at the intersection of system innovations and transitions theories and design theory and practice, namely Transition Design. So far, there have been four main theoretical contributions to the field.

These contributions have overlaps and divergences in their foundational theories, their framing of transitions and focal system components, as well as their proposed tools and methods. At their core, they all share the view that there is an urgent need for systemic and structural changes to take place in socio-technical systems in order for society to become sustainable, and that these change processes can be formulated and approached as design projects. The contributions show that Transition Design can be relevant to different implementation contexts (including companies as well as communities), within large transition projects, and for design and innovation teams. Transition Design, following on from these early contributions, is about the transition of design as much as it is about the design of transitions. As it is an emergent field with a decade-long history, interest in Transition Design in practice is in a nascent stage. Although there are some structural impediments to the speed of its uptake, there are also hopeful signs that wider adoption may soon take place. There is ample room for this new area of design for sustainability to further develop and strengthen its theoretical base and practical relevance. Some indications provided in this article include:

- Adopting a consortium model in running Transition Design projects;
- Advocating open innovation across open networks of learning and finding a suitable governance model to enable this;
- Investigating how established and new designs for sustainability approaches could complement the theory and practice of Transition Design;
- Moving away from the legacy of human-centered design and giving a voice to the voiceless by integrating theories from feminism, animal studies, post-humanist ethnography, political ecology, and literature on decolonizing methodology; and
- Integrating transition typologies into the theory of Transition Design and reflecting on the potential roles of Transition Design in a post-transition context.

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Resumen: El campo del diseño para la sostenibilidad ha evolucionado considerablemente en las últimas décadas. Sus inicios se caracterizaron por abordar problemas individuales de forma aislada, con una predisposición principalmente optimista desde el punto de vista tecnológico y un enfoque en la innovación incremental de productos. Actualmente, "el borde" del campo se ocupa estratégicamente de problemas sistémicos a largo plazo, con un enfoque en el bienestar humano y el ecosistema. Esta evolución se ha alineado y ha sido parcialmente influenciada por la emergencia de la ciencia de la sostenibilidad y las innovaciones de sistemas y las teorías de las transiciones, así como por el avance científico que apunta a la creciente urgencia de la acción. Este artículo presenta una visión general del surgimiento del Diseño para la Transición, analiza el estado actual de la teoría y la práctica, y proporciona sugerencias para el avance teórico y práctico del campo.

Palabras clave: Diseño para la sostenibilidad - diseño sostenible - sostenibilidad - transiciones - diseño - Diseño para la Transición.

Resumo: O campo do design para a sustentabilidade evolucionou consideravelmente nas últimas décadas. Seus inícios se caracterizaram pela abordagem de problemas individuais de modo isolado, com uma predisposição principalmente optimista desde o ponto de vista tecnológico e um enfoque na inovação progressiva de produtos. Atualmente, o limite do campo ocupa-se estrategicamente de problemas sistêmicos ao longo prazo, com um enfoque no bem-estar humano e o ecossistema. Esta evolução se alinhou e foi parcialmente influenciada pela emergência da ciência da sustentabilidade e as inovações de sistemas e as teorias das transições, assim como pelo avanço científico que aponta á crescente urgência da ação. Este artigo apresenta uma visão geral do surgimento do Design para a Transição, analisa o estado atual da teoria e a prática y faz sugestões para o avanço teórico e prático do campo.

Palavras chave: Design para a sustentabilidade - design sustentável - sustentabilidade - transições - design - Design para a Transição.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Design's (Dis)orders: Mediating Systems-Level Transition Design

Cameron Tonkinwise *

Abstract: Transition Design requires a different kind of designer, one who is not subject to the same kinds of motivations and satisfiers that have ruled design for the last century. This chapter articulates the psychology of Transition Designers as they strive for systems-level rapid change. As a result, the crux of Transition Design emerges as a practice of materially mediating structural change over time through networked collaborations. The cure for the modernist designer's megalomania and perfectionism lies in learning to "stay with the trouble".

Key words: orders of design - systems design - massive change - design at scale.

[Abstracts in spanish and portuguese at page 96]

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Alienated Designers

Although designs are pervasive (they are every single thing nearly everyone on the planet depends on every day), design (the process of designing) remains little understood not only by people in general but also by nondesign academics who are otherwise concerned about society and how to change it. This makes designers, the people with expertise in how to make the useful things we are surrounded by, seem strange. Designers pay attention to things that nearly everyone else just takes for granted. On one hand, designers notice the smallest faults in things that seem to most of us completely satisfactory. Instead of just getting on with things, designers always seem to be pausing to interrogate the material quality of this sign or that chair, those interfaces or these shoes. On the other hand, designers never seem to see things for what they are, but are instead always imagining what else they could be: A corner of the room needs a different kind of lighting, some discarded

fabrics could be bound into a chair or shredded into house insulation, and the way people in certain cultures greet each other with a handshake suggests a metaphor for the interface of an online security protocol. These contradictory habits of mind –attending too much to things and attending too much away from things (this turn of phrase, "attending to" is from Polanyi 2009)– make designers seem unusual.

These qualities could even be considered productive disorders, abnormalities that allow extraordinariness. At one end, designers tend toward a kind of obsessive compulsiveness. This excessive concern for detailing derives from design's craft origins. As David Pye (1968) once noted, craftspeople must be very careful because there is an inherent risk involved in any act of hand-making. The imperfections that are tolerated in craftworks, even celebrated, however, must be eradicated once designers begin to fashion models for mass production. Craft fastidiousness becomes designer perfectionism.

At the other end, designers are prone to a certain megalomania. The European origin story, centered on the Bauhaus (see Findeli, 2001), and the North American version, as expounded by the Streamliners (see Andrews, 2009), argued that modern styles of art derived from new machine forms and materials, when applied to everyday products and environments, could de-traditionalize people, accelerating them into more universal, efficient, and rational ways of living. For this reason, everything should be (re)designed: total design.

To insensitively stretch the metaphor, being bipolar in this way, strung between material detail and metaphysical systems, leads designers to be insufferable narcissists at some times and paranoids at others. Designers swing maniacally from naïve optimism about their capacity to improve the quality of anything to hypercritical pessimism in which it is incumbent to do, as Raymond Loewy titled his autobiography, *Never Leave Well Enough Alone* (2002).

Anthropocene by Uncoordinated Design

There is a serious aspect of this probably offensive diagnosis. Although designers are strange, or because designers are strange in these ways, they have a hand in the creation of almost every product, environment, and communication with which anyone engages. Where everyone else just uses things without noticing their qualities and their other possibilities, the disorders that distinguish designers motivate and empower them to keep making and remaking things. Products keep changing and so pile up around us (global consumers) before they wear out precisely because designers note some imperfection, some interaction pain point, some other way of accessing efficiency or productivity, or convenience and comfort, or just passing sensorial pleasure.

The world suffers at the moment from this gap between the detail-oriented materialism and the systems-imagining utopianism of designers. That planetary pathology is well captured by the notion of the Anthropocene. Millions of designers make billions of things. Designers tend to bring an obsessive focus to whatever design situation they are trying to transform. They channel their fantasies of world-changing power into this particular website or piece of equipment or service, imagining that if every aspect of this design

context were comprehensively integrated by a highly resolved, elegant design concept it would make all the difference in the world. However, the foci of every designer never get coordinated. Well-designed products might perfectly respond to the needs of a certain set of people in some current set of conditions, but invariably those needs, people, and conditions are quickly impacted by the arrival of other products designed for different contexts. What was well-designed then no longer fits, and the resulting redesign, in turn, impacts other context-specific-well-designed products. The results are societies that are unsustainably materials intense, accumulating junk in landfills and ocean gyres, and generating accelerating volumes of ecosystem-damaging toxins and climate-changing pollutants. The Anthropocene signals a moment at which humans are having impacts on a geological scale. These impacts are by design, but they are not able to be designed. Designers have megalomaniacal powers, but their material detail compulsiveness means that they are not in control of all that they are collectively doing. Their idiosyncratic ways of being dreamy yet driven makers is undermining the very societies the designers wish to service.

Transition Design is obviously motivated by the unsustainability of the Anthropocene. At its crudest, Transition Design aspires to rekindle the large-scale ambitions that surrounded the formalization of design in the first place, at the beginning of the 20th century. The crises that are symptomatic of the unsustainability of how our societies are currently organized demands radical and immediate structural change. We need to completely redesign not only how we resource our everyday lives but also the very values that motivate those ways of living: massive change as Bruce Mau espoused, heroic futures Alex Steffen as described them. This is why the top compass point of the Transition Design model is visions. However, the total design project of modernism was part of the problem. Early designers on either side of the Atlantic had strong visions that they often managed to impose with procrustean force. Because these visions were universalist, the designers paid no attention to local specificity, whether cultural or bioregional. The resulting displacement cleared the way for the commodity flows of globalization.

Transition Design therefore tries to qualify its reinvocation of rapid, ambitious structural change. Transition Design asks that those visions motivating change be context-specific and modifiable to all that happens as change is implemented. To do this, designers need more sophisticated theories of change than to materialize the vision. They need to understand, at the level of practice expertise, what it means to try to enable structural change in complexes of living systems and sociotechnical systems.

Further, Transition Design recognizes that to do this, to switch from making things with obsessive care even if in the hope that the result will history-making, will challenge the psyche of the designer. The mindset and posture section, which grounds the Transition Design model, is there because Transition Design, to some extent, acknowledges the role the pathological disorders of designers has played in Anthropocenic unsustainability. To enable the transitions urgently needed by our societies, designers must cure themselves of the conditions that have, to date, motivated their designing. This is not a matter of renouncing completely their concern for material quality and their fantasies of society steering; instead, it requires redirecting these tendencies.

In what follows, I want to try to clarify what those redirections entail. I do so by exploring a range of existing approaches to systems-level redesigning. I emphasize the role that ma-

terial designs play in mediating such large-scale phenomena and change. Understanding the nature of these mediations that material designs effect, can, I argue, bring together the designer's attention to detail and ambition for change in ways that can respond to instead of just exacerbate the Anthropocene. Working with these mediations also opens designers up to forms of collective action over time that are essential to the efficacy of Transition Design.

Design in Many Sizes

The word *design* covers many different kinds of designing. The categorization of these subdisciplines of the profession of design are often made according to the nature of what is being designed: a communication, a fashion item, a product, an interior, etc. The suggestion is that the kinds of decisions a communication designer needs to make are quite distinct from those of a product designer. Their materials are distinct, as therefore are their tools. Each practice of designing, therefore, tends to have its own history of precedents, patterns, and principles.

From one perspective, the distinct forms of designing have different objectives: meaning and use, for instance, in the case of communication and product designers, respectively. However, from another perspective, both want to change what people do in the world and to do so via persuasion: a communication changing someone's understanding about the world and so then their interactions with that newly understood world or a product persuading someone through form to buy it and then use it in particular ways in order to go about doing something in the world in a new way.

What is common to all designs is that they manifest in some kind of thing. That thing is usually a discrete material product, whether that be "a poster or a toaster", a jacket or the chair to hang it over. But these days, the outcomes of design can also metaphorically be things: an app, a media experience, a service journey. Designers change what people think and do through the things that they design and get people to engage with.

To this extent, one can rank the different kinds of designing by the size of the things people design rather than the things' separate qualities: letterform, image, page, book, tool, clothing, furniture, white good, car, interior, building, organization, neighborhood, and city. A sequence like this suggests that the scale changes the nature of design; designing a small thing is very different from designing a big thing.

This is not just a categorical dispute. It sets up the first question about the nature of Transition Design. If Transition Design is about large-scale systems change, in response to the Anthropocene, is it even still a kind of designing? Is it not instead more like architecture or planning? I want to argue precisely that what Transition Design brings to structural social change is the design of handleable-scale artifacts, that this perspective affords something different from how practices like architecture and planning approach systems-level change.

I need to be clear here about what this argument involves. I am not sure, for instance, that architects and urban planners do not actually design. It is difficult for most people to get their heads around large, complex structures at scale, as they will be experienced. Consequently, in most cases, architects and planners actually work with models of those

structures. These models might literally be maquettes or physical models, or they might be computational models visualized –as scaled-down forms in the case of most architecture or as systems of flows often in planning– on screens as objects that can be manipulated. If designing is the expertise particular to creating human-scale things, then when architects architect and planners plan bigger things, they are in fact designing, because they are making their decisions based on human-scale things.

This can be a risky thing to do. There is a danger that designing the large scale via models mistakes the map for the territory. There are aspects of designs that because of their scale are more controllable; extending this sense of controllability to wider systems is erroneous. Western philosophers have long counseled that we should not be trying to design social systems as if they were tools or machines. You will miss the complex living aspects of social systems when they approached with *techne* (see for example Dunne, 1997; Flyvbjerg, 2001, or in a more recent management context, Chia & Holt, 2009). Such designs tend not to fail but to succeed by reducing the people and places involved to manipulable materials. Therefore, I am not arguing for this version of design mediation of large-scale design.

To explain what I am arguing for, consider that another account of the different scales at which design works suggests that the design of larger things is just the design of more things. An interior comprises light fixtures, furniture, and equipment but also wayfinding; in other words, an interior entails the design of many products and some communications. A service design can require designing uniforms and digital touchpoints, as well as interiors that orient customers and sculpt the experience. In this sense, larger-scale design involves lots of kinds of designing of many things (Tonkinwise, 2012, 2014). The point here is that such larger systems designing requires designers to try to coordinate many-things designing. This requires tempering their detail focus. But it also requires tempering their megalomaniacal tendencies, as in large systems there will be too many things to control. Designers of organizations, buildings, or even just multiple-path services have to design agility into the many things they design, rather than trying to assure that every thing functions as designed.

Volumes of Design

This hierarchy of design by the scale of the product is deceptive, however. When an architect builds a building, no matter how big, there is in the end only one building, whereas there might be a million of some product an industrial designer makes. That building's image might circulate widely, and perhaps thousands of people will visit such an iconic piece of architecture, but the number of people who get to experience the building as designed –living and working in it– is comparatively small. In contrast, it is not just that there are a lot of iPhones; it is that people with iPhones have them with them almost every minute of the day. Further, a graphic, designed for an advertisement that plays during a globally televised sporting event, will be viewed by millions. A typeface might be used for billions of words over a century. And an applet on a digital platform might have billions of daily active users. In a different way, the design of a component, like an Allen hex key, or a shipping container, or the interaction design behind an online shopping cart, not only

gets used a vast number of times but also becomes the infrastructure for whole industries or technologies.

These examples suggest that the design of certain smaller things can have a much larger impact on the design of large things, even if they are as large as a city. If Transition Design aims to increase the agency of designers in relation to bringing about change toward more sustainable futures, then Transition Design has to be attentive to those types of designing with large-scale reach. This is why the fourth arm of the model involves consideration of new ways of designing. Undertaking Transition Design involves a fundamental redesign of design itself. As more sophisticated theories of change suggest, this metadesigning cannot be done ex nihilo. On the one hand, redesigning design into Transition Design must involve colliding traditional (Eurocentric) forms of professional designing with other related yet distinct practices (for instance, community organizing, social innovation, etc.) but more importantly, also learning from the ways other (non-Anglo American) peoples practice making and social change. But Transition Design must also be attentive to transformations in how design is taking place even within the very heart of the Global North's capitalism modes of production.

The kind of product design undertaken by social media platforms and tech firms represents an important opportunity for Transition Design with respect to effecting large-scale change. Transition Designers must find ways of negotiating the new types of designing involved in these information systems. If it is difficult to comprehend a large-scale system like a building or a city, then it is impossible to have a clear sense of what millions of active users means. Before the arrival of design (Winograd, 1996), software development was entirely a one size fits all process. There was merely an abstract version of the user guiding what was produced. Design was first incorporated into information system design by synthesizing a range of people into one persona to make designing possible (Cooper, 2004). This is an important point for Transition Design as it struggles to understand social values or human needs without being reductive. As computational power has increased, designers are able to be more responsive to a finer grain of users, though only because of systems which also entail the entrenchment of surveillance capitalism. Important new forms of designing being used by tech companies to find customizable value propositions are agile software development, lean startup, and lean user experience (UX). These processes are motivated by efforts to avoid waste and produce only what people demonstrably need. However, an overriding concern is accelerating the production of market-testable options, something that trivializes rich modes of social research and renders liquid, in Zygmont Bauman's sense (2013), any of the products of design. How to redirect the forceful scale accessed by designers working in agile and lean ways within platform economies toward the project of Transition Design. (I have started to think through these topics but not yet successfully; see Tonkinwise, 2015, 2016.)

This last point, concerning the length of time that a designed product manages to exert influence over what people do, draws attention to another key feature of design-enabled structural change –its timescale. A mass-produced product might be owned and/or used by an individual, family, community, or organization. The product may be for occasional specialist use only, regular use, or continuous use. And it may service those people with those rhythms for one use only, a season, a year, a decade, or a century, or more. Each in-

dicates something about the capacity for a design to mediate a larger or longer change in how people live and work. And each involves distinct ways of designing and dispositions from the designer. How, for example, to design something that will outlive the designer, perhaps outlive one generation of users by being passed on to a subsequent generation? What kind of design research, design critique, and design testing is appropriate in those situations, situations that are crucial if we are to conduct multiphase transitions to wholly new societies?

Rhetorical Design Orders

An early response to the rise of new forms of designing, like digital interaction design, was Richard Buchanan's (2001) orders of design: first order, signs and words; second order, products and things; third order, processes and services; and fourth order, environments and cultures.

At first, these orders seem to be scaled similarly to ones already discussed, from small to large. There is also an implied historicity to the list. One version of his account of the orders of design was published by Buchanan (1998) as part of a response to Andrea Branzi's explorations of what *Design after Modernism* (this is John Thackara's [1988] phrase) entailed. The background claim is that design evolved from a decorative art focused on styling preexisting products (the first order) to the designing of the products themselves (the second order). Postindustrial designers researched the contexts of the use of their products, with this realm growing into the activity-flow design of user experience (the third order). The trajectory of this history seems to indicate that the concerns of designers will widen further, deploying soft systems thinking to design organizational and even (trans) national built environments and cultures (the fourth order).

This kind of historicizing of design's development suggests that Transition Design is merely the next logical step of a linearly maturing profession. However, interpreting the orders of design in terms of this progression is wrong. The Bauhaus and the Streamliners at the birth of modern design explicitly characterized their ambition as of the fourth order. But more significantly, Transition Design is a move away from the unsustainable direction that design has been reinforcing for the last century. The structural change that it seeks must not entail the same kind of logic as the orders of design model suggests. Therefore, let us interrogate more closely the nature of Buchanan's argument.

The orders of design model insists that as the scope of designing enlarges, there is also a qualitative shift in how designing happens. Buchanan was one of the first people to promote in any comprehensive fashion the notion of design thinking. That is because Buchanan characterized higher-order designing as something distinct from design-as-making.

The version of the orders developed by Tony Golsby-Smith (1996), a collaborator with Buchanan, for example, foregrounds that the different kinds of designing at each order involve a larger scope for each design consultancy, requiring the designer to speak to more people, for longer. In the first two orders, the focus of the designer is on the artifact, whether it is a communication or a product. There is a briefing from the client about the

nature of the user, but the designer focuses on the mediating artifact. In the third order, the designer spends more time on the problem rather than rushing to the artifactual solution, reframing the client's understandings of the problem as a result of researching what is problematic for the projected market and/or how those people will experience the emerging design. The fourth order reframes the problem further, contemplating organizational change for the client and cultural change for the community.

On one reading then, escalating orders of designing involve situations that are increasingly wicked (Buchanan, 1992), requiring designers to spend more time negotiating with multiple stakeholders to attain consensus about ways of framing problems. As designers seek to make wider changes to larger systems, they must therefore engage in more political thinking before they get to think with material interventions in those situations.

However, in other versions of the orders of design, Buchanan used a second axis that identifies various rhetorical arts that correlate to all the different kinds of designing: *invention* or the discovery of persuasive argument, which tends to correlate with signs and symbols; *judging* the viability of a proposal to produce something, which tends to correlate with products and things; *decision-making* with a group of experts about process planning and service strategy, which tends to correlate with processes and services; and *evaluating* wider societal needs, which tends to correlate with environments and cultures. On this reading, all orders of designing involve thinking arts even if their concerns and outputs are more material.

To put it the other way around, all orders of design should still involve aspects of the other orders. Doing third- and fourth-order designing does not entail leaving behind (or until later) first- and second-order designing. To do decision-making in relation to services and evaluating of environments, you still need signs, symbols, products, and things. Facilitating workshops on organizational culture requires the production of mediating materials, such as appropriate graphics and furniture, software, and clothes. This is very apparent when looking at things like Conklin's (2006) dialogue mapping tools and techniques for making collective sense of wicked problems. These products of design that, in turn, enable a higher order of designing can be interpreted as functioning rhetorically as Buchanan (1985) does, although it seems more productive to read their agency as deriving more from their materially afforded mediation (see Tonkinwise, 2017; Verbeek, 2005).

Design thinking at the systems level of wicked problems does not therefore refer to designers thinking more and making less, but rather bringing the thinking that happens through designerly making –whether visual, material, or interactional– to those more complex contexts.

Pathways to Collective Impact

Buchanan's orders of design argument was the first in a series of polemics about design research that aimed to mature the profession of design into a discipline with its own research epistemologies and ontologies. As a result, designers can increasingly participate alongside other more established disciplines in responding to complex social problems, and in many cases claim to be in the best position to lead such projects. Transition Design

is explicitly an attempt to bring knowledges from other disciplines into the principles and practices of design, and vice versa, asserting the importance of the design of human-scale material mediations for effecting multilevel, multistage sociotechnical transitions.

This inherently transdisciplinary nature of Transition Design is why accounts of the development of Transition Design (Irwin, 2015) foreground the pathways in the social design matrix that emerged from the 4th Winterhouse Symposium and was elaborated at the Art Center Pasadena's Leap Symposium. This map combines levels of engagement, or what I have been calling in this chapter, scales of design, with the nature of expertise involved, from design-specific through interdisciplinary collaborations to networks. The model looks hierarchical (many of these models imply in a Western-based conceptual metaphor way that you should be aiming to get to the top right), but the pathways in social design models are more a tool for making a decision about the appropriate entry point for the scale of change that suits current conditions and resources.

The pathways now need to be integrated with the collective impact movement that is currently dominant in social innovation (Kania & Kramer, 2011). This makes an important point about the way in which Transition Design negotiates the megalomania of design-led structural change. Collective impact is a multiorganizational approach to social change. This movement insists that systems-level change requires a networked approach in which no one person or organization is the authority (though there is the need for a backbone organization). This means that cosmopolitan localism is not just a quality of the vision that Transition Designers pursue, but that Mindset and Posture are essential to the New Ways of Designing that enable transitions. The work of a collective impacting Transition Designer occurs at a local leverage point but within a cosmopolitan network of multilevel interventions undertaken by others. This is not a system of military control but precisely an effort toward the kind of coordination that has been lacking from what designers have done to date individualistically and consequently resulted in Anthropocenic unsustainability.

Coordinating Designing Over Time

With this, I am returning to the more psychological perspective with which I began this chapter. I have talked about the fact that Transition Design must very much be a kind of design, operating with a care for material quality no matter at what order the design is attempting to bring about change. But what is especially distinctive about Transition Design is that it concerns transitions. The scale at which Transition Design is choosing to respond to the Anthropocene has less to do with the size or volume of what is designed or for who it is designed than it has to do with its duration, the temporality of its change. The word transition emphasizes a change over time, a series of ontological shifts. Transition Designers not only coordinate with a range of other professions and disciplines to establish pathways for collective impact at the level of cultures and environments; Transition Designers also attempt to coordinate with a range of changes over time. These designers create visions to motivate moves into futures in which other futures might be subsequently possible. Transition Designers build platforms to see around corners. Again, coordinating over time demands something very different from a commanding desire for control; but it

also requires being released from a sense of perfectionism, from the idea that what is being designed might be finished, in every detailed aspect, once and for all.

From this perspective, another kind of disorder prevalent among (lower-order) designers is what could be called their serial monogamy. They focus committedly on one project, working toward completion. Within that project, designers do not, in fact, aim to "satisfice", as Herbert Simon (1996) claimed. Invariably, time and/or money constraints end the project before the designer accomplishes that desired true completion. And then, invariably, the designer will move on to a different job. It is pathology that designers are quickly bored by the same type of job.

Staying with the trouble (the title of Haraway's book (2016) in a related context) –because there is no stopping point to wicked problems– must be a trait of a higher-order designer, especially one whose ambition is to be a change agent of transitions. Consequently, what is unique about the transition order of design is that designers have the methods and theories but also the (psychological) disposition to undertake multiple changes within a situation over time. Designers always recognize that they will have to make many moves, many moves at the same time, but also many subsequent moves. They design with a view to the subsequent moves that need to be made. There is no perfectionism because from the outset every design intervention is already seen as only the first in a series of others. Subsequent interventions might need to be reevaluated once the consequences of the initial intervention have played out. But there is never the sense that the initial intervention will be sufficient.

This is a very different kind of designer, one who cannot be megalomaniacal because the level at which he or she is operating is complex and wicked and at the edge of limits and serious risks. But this designer also cannot be compulsively detailed because there will be a need to quickly follow up with the next move. Neither naïve nor cynical, this is design as responsible work, creative and critical, but no longer drifting through boredom waiting for inspiration.

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Resumen: El Diseño para la Transición requiere un tipo diferente de diseñador, uno que no esté sujeto a los mismos tipos de motivaciones y satisfactores que han regido al diseño durante el último siglo. Este capítulo articula la psicología de los Diseñadores para la Transición mientras luchan por un cambio rápido a nivel de sistema. Como resultado, el *quid* del Diseño para la Transición emerge como una práctica de mediación material en el cambio estructural a través del tiempo y de colaboraciones en red. La cura para la megalomanía y el perfeccionismo del diseñador modernista radica en aprender a "lidiar con el problema".

Palabras clave: Órdenes de diseño - diseño de sistemas - cambio masivo - diseño a escala.

Resumo: O Design para a Transição precisa um tipo diferente de designer, que não esteja sujeito aos mesmos tipos de motivações e elementos de satisfações que regiram o design durante o último século. Este capítulo articula a psicologia dos designers para a transição enquanto lutam por uma mudança rápida do sistema. Como resultado, o quid do design para a transição emerge como uma prática de mediação material no cambio estrutural através do tempo e de colaborações em rede. O remédio para a megalomania e o perfeccionismo do designer modernista está em aprender a lidar com o problema.

Palavras chave: ordens de design - design de sistemas - mudança massiva - design à escala.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

On Digital Citizenship and Data as a New Commons: Can We Design a New Movement?

Ingrid Mulder *, Tomasz Jaskiewicz ** and Nicola Morelli ***

Abstract: Along with the urgent need to reinvent our society, a series of paradigm shifts are already shaping transitions toward a more participatory and digital society. The current work takes stock of the promise of open data as a new resource and elaborates upon the maker movement, which has spurred people's capacity to participate and has provided tools and infrastructures to unleash people's intrinsic ability to create and innovate. We explore how open data can be a new commons, discuss how hackathons can support digital citizenship, and reflect on the role of Transition Design in creating ecosystems around the common resource and in building capacity.

Key words: capacity building - data literacy - diffuse design - digital citizenship - hackathons - open data - paradigm shift - societal challenges - Transition Design.

[Abstracts in spanish and portuguese at pages 108-109]

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"The world is undergoing immense changes. Never before have the conditions of life changed so swiftly and enormously as they have changed for mankind in the last fifty years" (Loorbach, 2014). Our society is increasingly digitalized and transforming into a participatory, collaborative, and circular economy. Botsman (2013) points out that two, or even three, major paradigm shifts are shaping the transition towards a collective society. A society that is shifting from a hierarchical to a network-based structure, on the one hand, is combined with a shift from scarcity to a surplus of underutilized assets, on the other hand. A third shift, still looming on the horizon, is addressing the alternative currencies and rating and curating methods that are needed to answer the diverse needs and values of the open cities of tomorrow. Although, one might argue that the participatory turn has been enabled through top-down voices, such as the promise of smart cities, the participation society, and the corresponding decentralization of the social domain, the collaborative society is being shaped through bottom-up participatory innovation paradigms, in the first place, designated by community groups reclaiming the public domain and who are increasingly willing to take greater control. These bottom-up trends have spurred a demand for new forms of self-organizing governance. In this turn to a collective or sharing economy, networks of individuals act as platforms. The collaborative phenomenon is much more than a trend or a hype –it is a movement, affecting society at large. It can also be seen as a series of paradigm shifts empowering and enabling society to transition. Today's societal challenges are increasingly putting pressure on the need to change (Max-Neef, 1991). Transition Design, as introduced by Irwin, Kossoff, and Tonkinwise (2015), explicitly acknowledges that we are living in transitional times and takes the need for societal transitions to more sustainable futures as its central premise, arguing that design has a key role to play in these transitions. Additionally, Mulder and Loorbach (in press) highlighted the importance of framing transitions as collective societal design challenges. Hence, we can no longer rely on optimizing existing systems, infrastructures, technologies, or knowledge infrastructures to deliver the necessary transitions. Transition Design as an emerging design discipline can play a critical part in moving away from unsustainable, locked-in regimes through processes of societal experimentation, iteration, prototyping, and scaling, guided by inspiring visions and future images. However, how this changing profession of designers should be shaped in order to be of value in societal transitions is not straightforward.

The current work aims to contribute to this debate and starts exploring how Transition Design can play a role in further diffusing both design and digital skills in society in order to broaden society's capacity to change. We take stock of the potential of open data as a new resource and leverage on the benefits of the digital transformation and the maker movement that has spurred people's capacity to participate and make. Next, we introduce our approach and the corresponding tools and infrastructures aiming to empower people in making meaningful use of these data. We conclude with a discussion and reflect on the role of Transition Design in establishing a new social infrastructure and building capacity. Can we catalyze a movement?

The Promise of Open Data

Recent years have seen the introduction of legislation on multiple levels of government that should enable the release of public sector information without reuse restrictions, that is, as open data. In the United States, President Obama has been in favor of data release (Obama, 2009). In particular, the Memorandum on Transparency and Open Government, signed in January 2009, declared his administration's commitment to creating an unprecedented level of openness in government and establishing a system linking three principles: transparency, participation, and collaboration. In the EU, a similar position was taken by the European Commissioner for Digital Agenda, Neelie Kroes (Kroes, 2011). The 2003 Public Sector Information (PSI) Directive of the European Parliament and the European Council also supports the release of PSI (European Commission, 2003). Ever since, public administrations around the world have embarked on open government initiatives and have worked to redefine their relationship with citizens and with each other. The benefits attributed to open government are manifold. They include claims that open government leads to more effective decision-making and services, safeguards against corruption, enables public scrutiny, and promotes citizens' trust in government, including better achievements of effectiveness, efficiency, or accountability. Public sector information when released into the public domain is deemed suitable for reuse by citizens and made available for the creative industry to build on and create new services.

Open data is generally seen as a promising concept to boost the co-production of new public services. Policy makers and politicians stress the potential benefits to transparency and innovation as a result of data release, in addition to better decision-making (Bertot, Jaeger, & Grimes, 2010; Kroes, 2011; Obama, 2009). Illustrating the potential financial benefits of publishing data is the MEPSIR study, wherein the value of the PSI market is estimated at €27 billion (Dekkers, Polman, te Velde, & de Vries, 2006). National governments have been providing instructions to make an effort to provide PSI to the larger public, and local governments need to define their own open data policies and create internal processes to do so. While there is consensus on the value of PSI for innovation and transparency, the exact impacts and benefits of open data policies still remain unclear.

Open Data as a Resource

In its premise, open data can contribute to transparency, aiming to improve the decision-making process in general. However, how these open data contribute to citizen participation and an inclusive society is less straightforward. This increased call for data release by governmental agencies is oftentimes a result of national policies or may be a call from active citizens, which is frequently presented in a provocative tone. Citizen's rights to the digital city seems to go hand in hand with citizens' distrust in government and/ or wish to take over governmental control. At the same time, citizens do not have equal access to these open data, even when the data is available, as it is hard to articulate the right questions needed to obtain the data; furthermore, demand for open datasets publication is probably hindered by the consolidation of publication formats and adequate aggregation of datasets. In our current work, we aim to support citizens in their right to initiate social

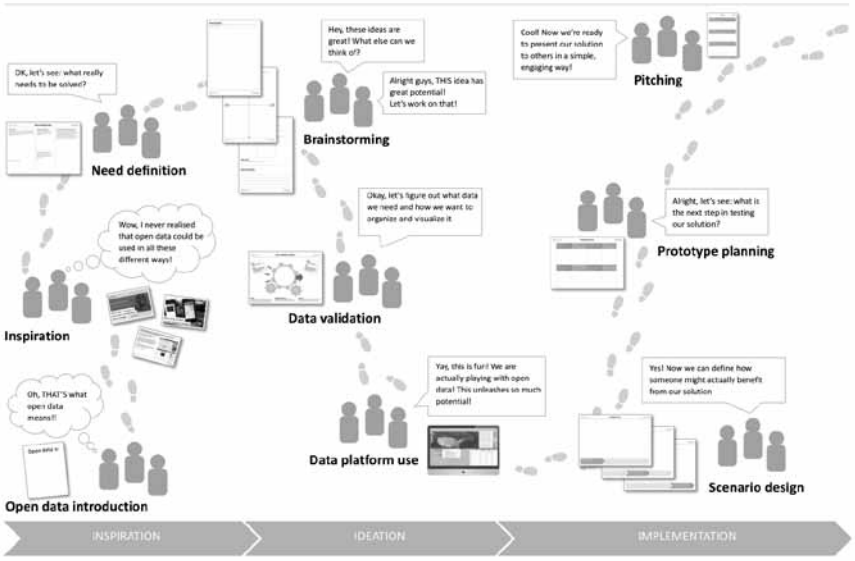
change and (the right) to challenge governments through addressing systemic barriers that cause inequity. The premise is that open data represents a new resource that is available to all, not just to data owners or large companies, but also to citizens, public administrators, and interest groups.

Open For Citizens

The Horizon2020 CAPS project Open4Citizens explores how open data can be considered as a new commons, and it supports citizens through hackathons in making meaningful use of these data. More precisely, the Open4Citizens project aims to broaden citizens' skillset towards meaningful use of open data (Morelli et al., 2017). The corresponding OpenDataLabs established in five pilot cities –Barcelona, Copenhagen, Karlstad, Milan, and Rotterdam– will help to overcome the cognitive gap the majority of citizens may have with respect to open data by making knowledge available. In these labs, citizens will experience the practical value of open data in the conception, modification, adaptation, and maintenance of urban services and explore hackathons as new forms of collaboration by explicitly connecting bottom-up initiatives and top-down policies through dialogue and co-creation.
As open data are seen as a new commons, the Open4Citizens' OpenDataLab clearly distinguishes itself from similar initiatives such as coding hackathons or service jams. OpenDataLab's focus is on empowering citizens to make meaningful use of open data and to support existing citizen initiatives. Open data can become a common resource if communities are built around them and create sets of practices and rules to use this resource in the most sustainable way.

Approach

The particular Open4Citizens approach aims to (a) aggregate a community that takes care of and uses the resource, (b) develop a set of practices for using the resource, and (c) provide infrastructure to the community through a set of tools that facilitate access to the resource and its usage (see Morelli et al., in press). Morelli and colleagues (in press) elaborate on the creation of the needed infrastructure for the exploitation of open data as a new commons, as well as on the aggregation of communities (ecosystems) of users, highlighting the hackathon process as an instrumental means to facilitate the creation of this culture.
The O4C approach, through the various components indicated above, is structured upon the extension of the hackathon from a two- or three-day pressure cooker coding event to a process of five to six months, including a preliminary phase (pre-hack) in which the community and the resources (datasets) are aggregated, a hackathon event, and a post-hack phase in which the hackathon's outcomes are developed and tested. The process of "infrastructuring" goes along all those phases: engaging citizens in the pre-hack, providing tools for co-creation (O4C toolkit, data tool), and infrastructure (the O4C platform) in the hackathon phase and providing infrastructure for incubation (the OpenDataLab) in the post-hack phases (See Figure 1).



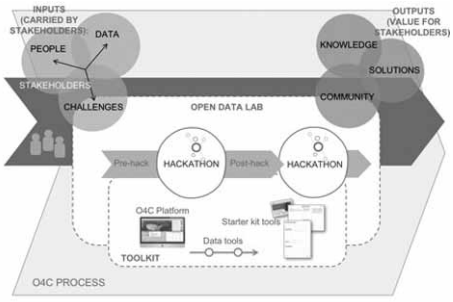


Figure 1. (top) O4C hackathon process tools.
Figure 2. (right) O4C ecosystem.

The OpenDataLabs, hackathons, and O4C toolkit are the three main concepts that structure the work of the O4C project, as indicated in the O4C ecosystem (See Figure 2). The OpenDataLab is a physical and virtual infrastructure that supports a broader use of open data among citizens, interest groups, and public institutions; it is also a network structure that links the OpenDataLabs in different locations to cross-pollinate knowledge about the use of open data across different communities. It defines hackathons as a set of practices that actively support citizens' initiatives and the creation of events that involve participants with different knowledge and competences. Finally, it provides an overview of the toolkit that supports the actual co-creation process through a "hackathon starter kit", data tools, and the O4C platform.

Hackathons for Construction of Common Practices to Work with Open Data

Open data can only become a new commons if a community and a set of practices is created around it. Therefore, community building is part of the creation of the OpenDataLab ecosystem, whereas the set of practices is structured around the O4C hackathon process. The O4C hackathon process provides a workflow that coordinates tools, processes, and knowledge for developing new and innovative public services, based on open data, with the active contribution of non-IT savvy citizens and the support of experts. The direct involvement of citizens will make the hackathon results much more likely to be taken up and will facilitate the integration and scaling up of the new services. One of the challenges faced by the consortium is developing approaches for attracting citizens and other stakeholders to be involved in these hackathons.

Besides sharing the same tools, methods, expertise, and knowledge, all OpenDataLabs adopt the three-stage hackathon "funnel" workflow. As Figure 3 shows, an initial pre-hack phase is characterized by intense activity focused on dataset identification, verification, and specification, running in parallel with the process of defining the challenge(s) that the hackathon is meant to address. Ideally, the emergent need for specific datasets that are not yet in the public domain, which would enable the proper functioning or performance of the applications under development, should prompt data owners to promote faster, more effective policies and practices of public sector information disclosure. Alongside the delivery of open data-driven solutions, additional benefits can be identified in the reinforcement of citizen interest and in the diffusion of domain-related and thematic knowledge among the participants and external observers, who are the most likely actors to step into a subsequent edition of the hackathon itself.

The above expresses the essence of the OpenDataLab innovation potential at both the local community level –as an enabler of public service co-creation by non-IT-savvy citizens– and at the global network level –as the common and joint output of initiatives and collaborations by all the nodes of the OpenDataLab network. More specifically the output of every innovation process in the OpenDataLab is expected to generate not only specific solutions but also more knowledge about open data practices and opportunities (See Figure 3).

Building the capacity of OpenDataLabs participants is connatural to all planned activities. Targets of this effort include people working inside them and those attracted by their initiatives. For instance, offering access to Open Data has a training or capacity building component, as does public service co-creation via O4C hackathons, using service design tools, methodologies, and processes, and the support the project is meant to provide to hackathon facilitators. Finally, education about digital citizenship is the ultimate long-term goal of an OpenDataLab.

OpenDataLab Rotterdam

The municipality of Rotterdam has embraced the 'right to challenge' as part of their transformed governance structure aiming to enhance active societal participation. The right to challenge is a shared initiative of Dutch local municipalities aimed at encouraging citizens to challenge their municipalities. This initiative initially focused on topics related to citizen health and well-being, but it is currently being extended to a multitude

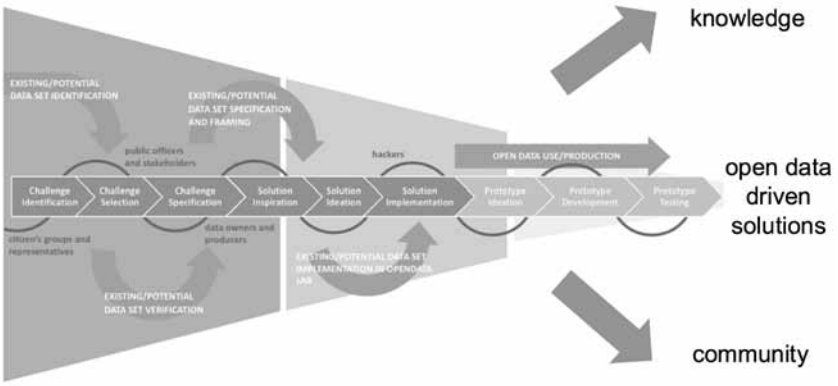


Figure 3. The three-stage hackathon "funnel".

of domains of interest where citizen activism takes place. In keeping with the spirit of the right to challenge, OpenDataLab Rotterdam focuses on the self-management of public parks. Self-management of public parks is a theme instantiating the transformation towards participatory city governance and involvement of active citizenship in city planning and organization. The sphere of a public park offers an opportunity to embrace multiple aspects of potential citizen engagement, as even one single park permits the coexistence of heterogeneous types of shared citizen initiatives. This provides an opportunity to study, compare, and stimulate a variety of citizen initiatives within one case study theme.

Specific topics related to public parks include provision of space for shared social activities (such as gardening, social meetings, events, and leisure activities), health-related initiatives (such as improvement of air quality, sports, and healthy lifestyle and outdoor activities), cultural and cross-cultural initiatives (such as festivals and cultural integration), heritage initiatives (such as promoting and spreading awareness of the history of the city), and stimulating engagement of citizens in city developments (such as area redevelopment plans). The overlap of these topics and the introduction of new topics emerging from citizens' needs provide additional opportunities for innovative solutions. Questions already expressed by parties involved in this project relate to better articulation of the social and financial value of social engagement initiatives around public parks in order to be able to challenge the public administration. What are the costs of green maintenance of a park? How do you allocate the available resources as efficiently as possible? Which business models are available? But also, how can more volunteers be involved in the park initiatives? How can communications be improved and become self-sustaining?

The primary focus of OpenDatalab Rotterdam is raising awareness of data and increasing participants' data literacy to facilitate wider support for innovative ideas and joint implementation. In other words, OpenDataLab Rotterdam does not "hack" the existing system,

but it explicitly facilitates joint exploration, learning from each other, and contributing to a viable and resilient city. For example, the municipality is explicitly exploring ways to include the collaborative learning process and the outcomes of the Park Hackathon in the program Democratic Challenge, a process that started with residents and other stakeholders in Delfshaven exploring the co-creation of new forms of direct democracy (decision-making rather than representative) by residents on issues –such as the establishment of a common courtyard– that are important to residents in daily practice and in their own neighborhood.

OpenDataLab Copenhagen

The O4C pilot in Copenhagen organized its first hackathon in October 2016 and is now in the process of organizing a second hackathon to take place in November 2017. The first hackathon focused on migration and integration. During the organization of the first hackathon cycle, the migration theme was in the center of public discussion in Denmark, in part because of some controversial decisions of the Danish government regarding rules for accepting new migrants. In addition to the operative aspects implied by those decisions, the debate centered on how to integrate the newcomers into Denmark and how to support them with adequate services. The O4C team assumed that this would attract the attention of citizens, public institutions, interest groups, and even private companies. The pre-hack phase revealed that, although the interest in this topic is very high, the ecosystem around this issue is not yet consolidated: there were not enough datasets available and few of them were publicly available. Furthermore, the public authorities who were contacted were reluctant to participate in the hackathon because the responsibility for managing various aspects of immigration and integration was not very well defined or well distributed among different public institutions. However, the hackathon attracted the interest of citizens, students, and some private organizations that were already working on the integration of newcomers into the Danish economy. The results of the first hackathon were heavily influenced by the flaws in the initial hypotheses: the lack of data did not give the participants the opportunity to generate a real service prototype, as expected; instead, more generic concepts were proposed, some of which were further developed into solutions that were not based on open data. Moreover, the lack of commitment from public authorities precluded any possibility of obtaining relevant data and developing or integrating the concepts resulting from the hackathons into new or existing public services.

Rather than a failure, the results confirmed the need for a solid pre-hack process, based on three pillars: (a) a valid and relevant challenge, (b) the availability of a consistent number of datasets, and (c) the participation of relevant stakeholders. The first pilot in Copenhagen was based on the definition of the challenge, as described in Figure 3, but neglected the research and validation of datasets and was unable to consolidate the participation of relevant social groups.

The second hackathon cycle is learning from this lesson and is shifting the direction of the challenge to address these neglected factors. The new hackathon will focus on outdoor tourism in the northern region of Denmark. Although less present in public debate, this is a challenge on which several institutions are now working, from public institutions (several municipal administrations in the region and the regional authority that promotes local

business) to private organizations (tourist operators in Nord Jutland) and research institutions. Many of these groups already own or are aware of potential datasets that can be used in the hackathon. The ecosystem being organized includes data owners (public authorities and associations of municipalities), problem owners (tourist associations), and other relevant actors, such as municipalities, citizen organizations, and potential coders.
A second lesson learned from the first cycle concerns the definition of the problem. The first hackathon event started with the early phases of the hackathon kit described in Figure 1, that is, inspiring the participants about the potential of open data. This limited the time spent on the development of valid concepts. On this ground, and also from the observations of other pilot program teams, the Copenhagen team decided to start the co-creation process in the pre-hack phase. This not only creates the conditions to specify the challenges at the very beginning of the hackathon but it also activates the stakeholders' ability to identify useful datasets for use in the hackathon.
Although the hackathon event has not yet started as of this writing, the process has already identified and specified five themes for the challenges and a number of datasets that are directly or indirectly related to each of the challenges. This is a promising element that may increase the possibility of obtaining interesting and operational outcomes from the hackathon.

Discussion and Conclusions

The experiences described in the previous cases suggest that the hackathon is a useful learning tool for citizens and communities. Furthermore, the hackathon can be a tool for capacity building and can become a practice that transforms open data from a public resource to a commons (Morelli et al., 2017). However, the present conceptualization of the hackathon event needs to be revised. An O4C hackathon is a learning tool, in which the capacity building activity is developed through the pre-hack process by aggregating an ecosystem of relevant actors and by working together to build competencies and knowledge about the available open datasets and opportunities to use them. While the hackathon itself is an activity that triggers citizens' creativity, supports social interaction, and generates opportunities for conversation among citizens, the construction of the ecosystem for the hackathon is an activity that aims at shaping the contextual conditions (political, administrative, business related) that are intended to incubate and support the hackathon results. The hackathon itself can be seen as an infrastructure that supports both the interaction among citizens and the construction of systemic conditions around the initiatives. The hackathons not only create civic engagement and data awareness and support digital citizens' pedagogy but they also link new forms of participation that propose new approaches to city-making or large systemic changes.

Infrastructuring Digital Citizenship

It can be concluded that the lessons learned across the pilot cities demonstrate an increased awareness among hackathon participants of the opportunities offered by open

data; a broader diffusion of creative (design thinking) capabilities within hackathon participants; cultivation of technical skills among the hackathon participants, to help them ideate and co-create new applications based on the datasets (that could be) made available by their owners; and dissemination of obtained knowledge and skills by hackathon participants to the broader OpenDataLab community and the general public.

More precisely, our lessons can be clustered along three logical levels: value in use, infrastructuring, and ecosystemic level.

Value in use is the logical level referring to the very moment in which value is created. According to Vargo and Lusch (2008), this is the moment in which users (Vargo and Lusch refer to them as beneficiaries) aggregate a set of operant resources to create value. Such resources consist of products, services, personnel, and knowledge. In the O4C project, value co-production through resource aggregation happens thanks to the interactions in the hackathon.

The interaction at this level depends on the stakeholders' diffuse design capability, generated by the negotiation among different problem-solving attitudes and strategies of the participants. The designers' problem-solving capabilities are just one of the components of this negotiation. At this level, the designers' expert contribution consists of using inspiration cards, prototypes, visual representations, and other tools to support the design process. The outcomes of the collaborative design activity at this level are the design solutions generated by the heterogeneous competences involved in the project.

Infrastructuring is the activity of expert designers that consists of generating logical structures (blueprints, templates, modular structures, and working frameworks) or physical structures (services, products, and events) that facilitate the process of value co-creation (Morelli et al).

Within the O4C project, the outcomes of the design activity at this level include the organization of the hackathon cycle and the body of knowledge for a systematic application of models, tools, and IT infrastructures (the O4C online platform) that can be used in the hackathon.

Designers define ecosystems to identify technical, social, and contextual conditions, aggregating and motivating actors to make the design action scalable and reproducible in different contexts. The design action at this level may concern incremental systemic changes or even broader transitions. In the latter case, the design action aims to introduce elements that facilitate negotiations and visions of possible future configurations. In the O4C project, this logical level includes the definition of the OpenDataLab, its scenarios and conditions of use, and the identification of the crucial stakeholders. The design knowledge needed at this level refers to the ability to understand the socio-technical implications of the proposed transformations into the ecosystem around the OpenDataLab. Therefore, it implies a wider, transdisciplinary, and systemic perspective of a specific problem area and the relevant ecosystem. Besides the OpenDataLab, the outcomes of the design activity at this level are frameworks for action and policies that will infrastructure digital citizenship and equality in using their rights to initiate and to challenge in the digital city.

Designing for Transitions

The three-level framework outlined above describes the possible contribution of design to both minor and large transitions, by linking the activity of design as an active agent of change –supporting interaction, engaging and enabling citizens– to more consolidated design activities –creating products, services, and infrastructures– up to higher levels in which design is an agent of broader transitions.

How can design empower more people as change makers and accelerate transition processes? Our lessons show that a smart combination of diffuse and expert design enables infrastructuring of digital citizenship through the diffusion of creative and digital skills.

The O4C approach encouraged articulation of issues before starting into data analysis. The collaborative reframing of the challenges changed the focus to more critical why-questions and encouraged participants to articulate better data requests necessary to demonstrate the societal value of their initiatives. In this way, the bottom-up hackathons showed the importance of story-finding as a scaffold for data literacy. In addition, the rich and contextually grounded insights enabled the citizen hackers to combine these "thick" data in such a way that they form a coherency that can be acted upon (Lodato & DiSalvo, 2016). The collaborative construction of the dialogue allows for collaborative learning, and it resulted in powerful narratives that enabled participants to take the hack proposals to the next step.

Earlier work on infrastructuring demonstrated the role of design in amplifying and connecting the power of bottom-up design (Manzini & Rizzo, 2011). Expert design interventions can be seen as small-scale experiments enabling social innovation. Although these social innovation experiments are niches within larger transitions, the ways that design can accelerate transitions are not straightforward. The current work, however, shows that the concept of data as a common (resource) strengthens "communing", as coined by Linebaugh (2009). One of the main outcomes of the hackathons was the strengthening of these networks and empowerment to make/take next steps. It can be concluded that a broader diffusion of design skills contributes to co-creating or creating ecosystems around the common resource and to the enhancement of society's (design) capacity to change.

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Resumen: Junto con la urgente necesidad de reinventar nuestra sociedad, una serie de cambios de paradigma ya están dando forma a las transiciones hacia una sociedad más participativa y digital. El trabajo actual hace un balance de la promesa de los datos abiertos (open data) como un nuevo recurso y elabora sobre el movimiento creador, que ha estimulado la capacidad de las personas para participar y ha proporcionado herramientas e infraestructuras para liberar la capacidad intrínseca de las personas para crear e innovar. Exploramos cómo los datos abiertos pueden ser nuevos comunes, discutimos cómo las *hackatones* pueden apoyar la ciudadanía digital y reflexionamos sobre el papel del Diseño para la Transición en la creación de ecosistemas en torno al recurso común y en la creación de capacidad.

Palabras clave: Desarrollo de capacidades - alfabetización de datos - diseño difuso - ciudadanía digital - *hackathons* - datos abiertos *(open data)* - cambio de paradigma - desafíos sociales - Diseño para la Transición.

Resumo: Junto com a urgente necessidade de reinventar nossa sociedade, uma série de mudanças de paradigma já está dando forma às transições até uma sociedade mais participativa e digital. Este trabalho faz um balanço da promessa dos dados abertos (open data) como um novo recurso e fala sobre o movimento criador, que estimulou a capacidade das pessoas para participar e proporcionou ferramentas e infraestruturas para liberar a capacidade intrínseca das pessoas para criar e inovar. Exploram-se como os dados abertos podem ser novos comuns, como as *hackatones* podem apoiar a cidadania digital e reflete-se sobre o papel do Design para a Transição na criação de ecossistemas em torno ao recurso comum e na criação de capacidade.

Palavras chave: Desenvolvimento de capacidades - alfabetização de dados - design difuso - cidadania digital - *hackathons* - dados abertos (open data) - mudança de paradigma - desafios sociais - Design para a Transição.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Teaching to Transition Design: A Case Study on Design Agility, Design Ethos, and Dexign Futures

Peter Scupelli *

Abstract: Design educators struggle to teach basic skills in traditional design courses needed for Transition Design practice. Transition Design's systems level change for societal sustainability poses three challenges: (a) What design experiences best prepare students to engage in systems-level change for societal-level sustainable futures? (b) What might be a scaled down Transition Design project for a semester-long studio course? (c) What design skills are needed to facilitate diverse human coalitions to pursue societal-level sustainability? In this paper, I describe fundamental design skill exercises introduced through three design courses to prepare students for Transition Design-type challenges.

Key words: design pedagogy - Transition Design - values based-design - design ethos - design agility - dexign futures - futures thinking - short-term horizon design - long-term horizon design - temporal design alignment.

[Abstracts in spanish and portuguese at pages 131-132]

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The world is changing at an exponential rate and design curricula and courses are challenged to keep up. Increasingly, designers are engaged in broader societal problems, for example, environmental degradation (e.g., Ortbal, Lange, Carroll, & AIGA, 1996), toxic chemicals (e.g., McDonough & Braungart, 2002), climate change (e.g., Steffen & Gore, 2008), voting rights (e.g., Lausen, 2007), and so forth.

Design disciplines are engaged with broad societal challenges, examples of which include architecture for humanity (2006), industrial design (e.g., Papanek, 1970), communication design for good (e.g., Berman, 2009), organizational change (e.g., Brown & Kātz, 2009), and instructions for continued life on planet earth (Fuller, 1969), among others.

The scale of design is changing. On one hand, some of the design problems are getting smaller and more specialized, while on the other hand, the problems on which designers work are getting bigger (e.g., Brown & Kātz, 2009), connected to global supply-chains, with global social, economic, and environmental impact. Designers are engaged with systems-wide implications of designed products and services (e.g., Mau, 2005). Such changes influence professional practice and require design schools to adapt their courses and curricula to better prepare for changing environments. Teaching students to engage with larger scale problems requires emphasis on collaboration between multiple disciplines and methods of design research that work at small and larger scales.

Design Evolves to Engage with Complex Large-Scale Problems

John Chris Jones described four levels of design –components, products, systems, and community– to advocate for new design methods for challenges such as traffic congestion and air quality (Jones, 1992). Jay Doblin described three levels of complexity: (a) products, the simplest form of design; (b) unisystems, coordinating products and the people that operate them; and (c) multisystems, the sets of competing unisystems (Doblin, 1987). Richard Buchanan introduced the four orders of design to contrast the traditional understandings of the disciplines of communication design (symbol), industrial design (product), interaction design (action), and systems design (thought) with new understandings of design that blur the distinctions between types of design (Buchanan, 1992).

Arnold Wasserman (2011) describes four versions of design to include design 1.0 as artifact centric (e.g., making and selling stuff); design 2.0 as human centric (e.g., strategic field building and embedding); design 3.0 as socio-centric (e.g., changing the world); and design 4.0 as the post-Anthropocene (e.g., sustainable prosperity for everyone on one planet). Elizabeth Pastor (2013), co-founder of Humantific, articulated the differences between four types of design that shift as levels of complexity increase: design 1.0, traditional design thinking; design 2.0, product/service design thinking; design 3.0, organizational transformation design thinking; and design 4.0, social transformation design thinking.

Others more recently have added the "X" nomenclature to create designX to get beyond the number of designs (e.g., Norman, 2014). The designX manifesto argues for a broader version of design that shifts from a focus on products and services to a broader range of societal issues. Such changes in understanding of the field of design require students to grasp how conceptions of design as a human activity have evolved over time and presumably will continue to shift as time passes.

Challenges such as societal-level sustainability require new thought, temporalities, and action. There is a tension between ever shortening design product cycles and long-term thinking. Examples in design industry include fast fashion (e.g., Luz, 2007), continuous beta (e.g., O'Reilly, 2005), and lean start-up (Ries, 2011). In large companies, designed products might be conceived for different timescales ranging from three months, to three years, or seven years. Much design education focuses on teaching students to craft products or services that can be made in a short time horizon. Plans for societal-level sustainability instead are on long horizons, such as 2050 or even 2100 (e.g., WBCSD, 2009; IFTF,

2015). Design for change requires aligning near-term design actions to long-term visions. Our current efforts are focused on developing pedagogies to teach these new skills.
In 2014, the School of Design at Carnegie Mellon University introduced Transition Design as an emergent field of design. *Transition Design* is described as the process of using *design thinking* and the *design processes* to transition to a sustainable society (Kossoff, 2011). In Wikipedia, *Transition Design* was defined as:

> …design led societal transition to a more sustainable future. It applies an understanding of the interconnectedness of social, economic, political and natural systems to address problems that exist at all levels of scale in ways that improve quality of life. Such problems can include poverty and economic inequality, biodiversity loss, decline of community, resource depletion, pollution and climate change.

Designers addressing larger scale problems in general and Transition Design in particular create a tension in design schools to cover traditional artifact centeredness and larger systems perspectives implicit in areas of societal concern (Scupelli, 2016). Such a tension requires the introduction of new courses and curricula. As is clear from this overview of changes to the field of design, there are many new topics to be addressed. This poses the challenges of what to teach and how to best teach it. In the next sections, I describe three themes relevant to preparing for Transition Design–type challenges: societal problems that require multiple perspectives, values embedded in design, and timescales aligning short-term with long-term horizons.

Societal Problems Require Multiple Perspectives

Human-centered design as it is often taught in design schools can easily default to customer-centered design. While it is helpful to begin design research focused on customer needs and product opportunities, it can be problematic to stop there. In the interest of time, students' focus can default to customer needs, ignoring the richer perspectives that explore what it means to be human and to lead a meaningful life. Students mistake business concerns for the humanities.
Customer-centered design can focus attention away from other people affected by a designed product. Who is making the designed product? Where is the product made? Under what working conditions? A service design framing forces designers to consider both customer needs and service provider needs to deliver a service. Furthermore, complex wicked problems have multiple stakeholders, who likely cannot agree on the problem (Rittel & Webber, 1973). One must focus far beyond customers and service providers to include multiple levels (e.g., individual, group, organizations, communities, public policy), and consider differing values (Bronfenbrenner, 1979). Hence, design educators are challenged to teach explicitly how to design for multiple stakeholders.

Values are Embedded into Design

Values matter. Value is created by design; values and biases are embedded into design processes, and values drive design. Therefore, there are ethical implications that designers must consider (Buchanan, Doordan, & Margolin, 2010). In short, technologies are not neutral; negative unintended consequences are to be considered (Merton, 1936). Anticipating unintended consequences of designed products and services is increasingly important, and the need to proceed ethically is increasingly acknowledged as a priority (e.g., Friedman & Nissenbaum, 1996). Furthermore, designers must consider the environmental implications for designed products (e.g., Shedroff, 2008). Consequently, the question of how to critically engage values in design processes is an important topic for design curricula.

Design educators increasingly have to accommodate new topics that are necessary to keep students up to date with the challenges they will face in their professional practice.

Timescales Aligning Short-Term with Long-Term

Short-term gains gathered much attention in design –namely, how to research and design products faster. Long-term timescales become a major element to consider from a design perspective when focusing on larger scale problems linked to sustainability. Researchers engaged in sustainable development instead describe goals for the year 2050 or 2100. It follows that design students must learn to design for short-term and long-term time horizons. Such challenges require that design educators learn to teach new methods in their courses.

In the next sections, I describe the three courses Design Agility: Speak Lab, Design Ethos and Action, and Dexign Futures[1]. These courses teach students some skills necessary for Transition Design to address multiple perspectives in design, values-based design, and multiple timescales. The three course descriptions are followed by three thematic questions: (a) What meaningful design project experiences might there be that allow students to experience the broad scope of systems-level change towards societal-level transition towards sustainable futures? (b) What minimum level of Transition Design might be a pedagogical experience that allows students to engage with making societal-level change? In other words, what is the way of being in the world that students need to learn to experience to become "redirective practitioners" working towards societal-level sustainability (Fry, 2008)? And (c) what skills are necessary to help design students learn to transition coalitions of unwilling people, groups, organizations, and public policies to achieve societal-level sustainability?

For each of the three courses, I describe the exercises done and provide insights into the pedagogy used.

Design Agility: Speak Lab

Design Agility: Speak Lab taught students to engage with social problems, find a story and audience, and make a pitch for funding a social innovation concept. Students learned to

Figure 1. Design Agility Speak Lab course blog. Course materials are available at: https://speaklab.wordpress.com/ Image Courtesy of Learning Environments Lab.

engage with large-scale societal-level design challenges from multiple stakeholders' perspectives. They shifted from the designer as service provider mindset, waiting for a commission, to the designer as problem finder and funding seeker.

Below are excerpts describing the course, taken from Scupelli and Rohrbach (2013). More details on the course can be found in the original article.

Design Agility: Speak Lab was a five-week course with a single project. During the first week of the five-week lab, students were exposed to real-world topics that affect the air they breathe, water they drink, and products they use daily (See Figure 1). Environmental problems were framed as unbelievable phenomena such as burning water (hydraulic fracking), mutant frogs (pharmaceutical waste), neighborhood assassins (air pollution), transgender fish (plastics in water), deadly cosmetics (toxic ingredients in cosmetics), killer produce (pesticides use), deadly technology (electronic waste), and dirty cleaning products (toxic ingredients in cleaning products). The unbelievable framing was used to pose the environmental problems as a mystery for the students to investigate (Scupelli, 2015).

Three theoretical perspectives shaped the activities in Speak Lab: multiple viewpoints, socio-ecological framework, and audience values. First, to grasp multiple viewpoints students explored their topic from various perspectives such as: scientific literature, public policy issues, industry marketing and public relations materials, interest and activist

group perspectives, and so forth. Multiple perspectives often become apparent by immersing oneself in a series of information sources that reveal the design space seen from multiple stakeholders' viewpoints and their relative biases.
Second, the contexts where large societal problems exist and decisions are made are often tiered, including individuals, families and groups, organizations, neighborhoods /communities, and public policies. A socio-ecological design approach operates strategically on multiple levels to change the context that shapes action.
Third, action taken by each audience is shaped by their values (e.g., ideology, biases, beliefs, desires, ambitions). Designers must consider their audience to shape a story that will resonate with them. For example, a story aimed to reduce water pollution for the good of the community is unlikely to resonate with individualists. However, it may be more effective with this audience if it is presented as greedy corporations disrespect you by polluting your pure drinking water, reduce your personal freedom, and right to choose.
On the first week of the lab, students were given a one-page overview document that summarized the topic and offered links to scientific papers, popular media articles, documentaries, and industry based misinformation campaigns. The goal of the first week was to dig into the information –gathering, organizing, parsing, clustering, etc.– so that they would have a robust amount of data to review that provided accurate perspectives instead of a narrow, shallow understanding of the subject at hand. Nonetheless, at the close of this phase, students were overwhelmed by the amount of information that they uncovered and quite confused about how to proceed.
During the second week of the lab students were taught how to make sense of the data and find a story worth understanding in it. One method involved asking the six questions (i.e., who, what, when, where, why, how). Another method involves sketching the relationships that exist among between concepts, stakeholders, and issues, which helped students see the topic from multiple perspectives and determine other research questions. The course instructor developed a series of sketching exercises based on Moyer's seventeen ways to structure information: just show it, blob diagrams, hierarchies, timelines, vignettes through time, quantity graphs, location maps, process diagrams, stock and flow diagrams, swimlane diagrams, decision trees, web of connections, gradients, two gradient matrix, comparisons, metaphors, and combos (Moyer, 2010). Moyer describes his information structures as aiding the visualization of big ideas. Students used the structures to identify what they knew about the topic (i.e., known knowns) and in what areas they needed to do more research (i.e., known unknowns). For example, students used simple information structures, such as a timeline, to visualize their current understanding of the evolution of the topic. The goal of making the timeline was to determine what they knew about the topic, and what they did not know, and would like to learn. The act of making the timeline sketch allowed students to visualize their knowledge and gaps in knowledge as well.
The students used Moyer's seventeen structure sketches to identify what they would like to understand and learn more about. They were encouraged to research the issue from multiple perspectives until they understood it well and could explain it to others. They made a second round of sketches to crystalize their understanding of the story. As they clarified the story to themselves, they were encouraged to begin brainstorming various ways that they could use design to communicate their story.

In the third week, the students continued iterating design concepts. After considering their target audience's needs and desires, they established the story's relevance to the audience, framed the message, and proposed its form. They considered what served as critical information to convey, why, to whom, and in what context. They were asked to identify a specific audience, propose ways to communicate the story, the appropriate context to engage the audience, and the type of media that would aid people's understanding, move them to action, and encourage them to think critically. The goal for this week was to get students to grasp the difference between understanding a story, and using stories to engage with a specific audience.

We discussed the students' intended audiences, as they defined them. To understand audience worldview, values, and goals we used the Dan Kahan's worldview framework based on two scales: individualist-communitarian and hierarchical-egalitarian (Kahan, 2008). Broadly speaking, individualists believe that people solely are responsible for their own fate. As such, they should be rewarded/punished for the decisions that they make. Government should stay out. Communitarians on the other hand believe quite the opposite. Hierarchical people believe that society should be highly structured, and ordered according to factors such as: gender, class, racial differences, etc. Egalitarians instead believe that society is quite the opposite and that all people have equal rights. Students determined where their target audience was on the individualist - communitarian scale, and on the hierarchical - egalitarian scale.

We discussed the degree of openness to new ideas scale as well. How open is the target audience to new ideas that clash with what they already know/believe? How threatened are they by new knowledge that challenges their worldview? Scientific knowledge is one way to frame new knowledge, but it does not resonate with everyone. For example, 99% consensus among the scientific community doesn't resonate with a climate change denier who believes in conspiracy theories linked to science. Thus, the question, is how can the story be framed and presented so that it resonates with the targeted audience? Some framings that may be considered alternatives to science are: moral issue, patriotic issue, disgust issue, impurity issue, fairness issue. Therefore, students considered how those framings resonated with their chosen audience.

In week four, the concepts were prototyped and discussed via peer-to-teacher and peer-to-peer critiques in the studio. Students were encouraged to think of the whole system and sketch how their system worked overall. They were then urged to think of what parts of the system they needed to further develop to include more granular aspects.

By week five, the students found a story and an audience that would benefit from hearing the story. They identified a design concept to deliver the story in such a way that the audience hearing it would take action as a result of engaging with the story. The intent was to move a particular audience to take some action. The next step was to find funding for their design concept and make a pitch to an organization that might be willing to fund their concept.

Design Ethos and Action

In the Design Ethos and Action (DEA) course, students articulated values that matter to them, learned to align personal and professional choices to their value sets, and learned to pitch design concepts aligned with specific values with measurable outcomes in a compelling way to organizations. Next is a brief description framing the course, followed by summaries of the four assignments. More detailed descriptions are available in Scupelli (2015a) and Scupelli and Hamilton (2017) (See Figure 2a y b).

Increasingly, designers have the potential to operate as agents of change in a broad range of areas including corporate, government, non-profit, social innovation start-ups, and sustainability projects. With so much choice on the horizon, some designers may wonder: What value do I bring to the world through design? Values often are implicit and may vary across contexts (e.g., profit, efficiency, effectiveness, fairness, social impact, environmental impact). In the excited rush to make things, often there is no time to reflect on how design choices impact the world or what values our choices embody.

Design ethos and action focuses on exploring and identifying the potential for positive and negative impact that design can have in the world around us. How might one link "values" to design action and assess the impact of design action (and inaction)? For example, how might a designer embed values related to sustainability, gender inclusivity, or race relations into his or her design projects and design practice?

The Design Ethos and Action course taught design students to design for a specific value-set finding and argue for a design concept with measures and outcomes that organizations would want to support. How might students intentionally design for specific values? The course is taught as a seminar with studio-type projects. Students study assigned readings and watch videos and discuss them in class. The course is organized around four assignments that allow students to apply the ideas in the readings to design problems.

From a theoretical perspective, the course was based on the idea that design methods can be analyzed from a structuralist perspective. That is, traditional modernist design methods are imbued with values such as efficiency and effectiveness. Can other value sets be embedded into design processes? What might a design process that embeds values related to sustainability, gender equality, or feminism look like? The goal of the course was to have students learn to design explicitly for different value sets.

Design students sometimes focus their attention to the shiny surface of made artifacts that can be presented as polished portfolio pieces. The Design Ethos and Action course problematized such an approach and forced students to consider the broader systems within which design products are situated. Herbert Simon describes design as going from a current situation to a preferred situation (Simon, 1969). Students were asked to explain for whom the situation was preferred: the customers, the manufacturer, the workers, the surrounding community, the environment, other life forms, and so forth.

Students sometimes believe contradictory claims. On one hand, design can change the world. On the other hand, designers in industry do not have agency to change business practices. Some comments students made in the course were that it is too expensive and unrealistic to design for sustainability. In the Design Ethos and Action course, students are confronted with such contradictions. Students are exposed to case studies from the

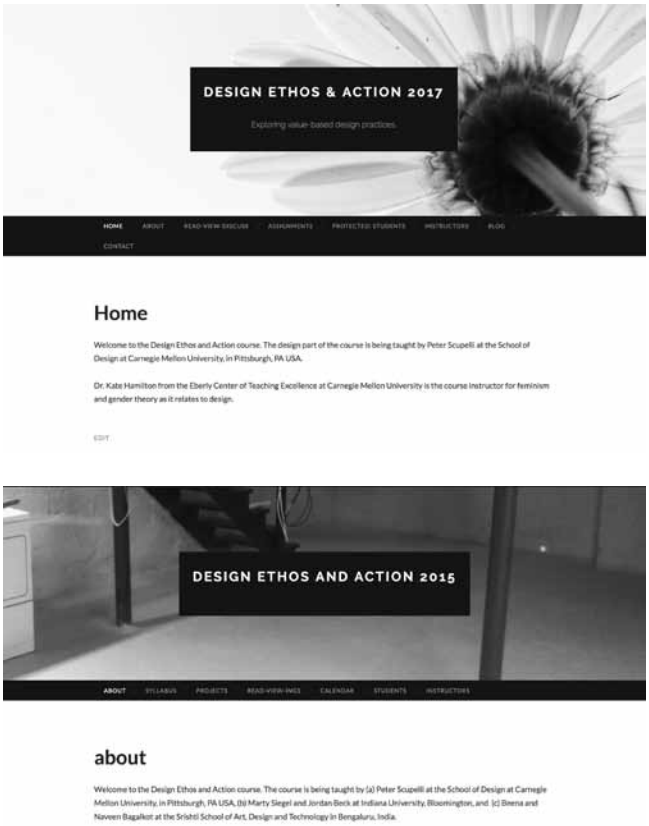

Figure 2a y b. Course blogs for the Design Ethos and Action courses in 2015 & 2017[2]. Image Courtesy of Learning Environments Lab.

Harvard Business School on companies that excel at sustainability practices. Prominent business leaders argued that sustainable companies have a better return on investment and asked how one could afford to be unsustainable (e.g., Heyns, 2012; Porter & Kramer, 2011; Winston, 2012).

Students learn that there are four responses to sustainability challenges based on a two by two matrix described by Lubin and Esty (2010). The first axis is sustainability vision (fragmented or integrated); the second axis is based on execution (tactical or strategic). Companies that have a fragmented vision for sustainability and little ability to implement such a vision are called *Losers*. Companies that have fragmented vision but are able to execute on such a vision are called *Defenders*. Companies that have big integrated visions about sustainability but are unable to execute are called *Dreamers*. Companies that have integrated visions and are able to execute strategically are called *Winners*. Lubin and Esty's framework helps students to make sense of the broader landscape of companies and sustainability.

The four assignments in the Design Ethos and Action class were the daily measures project, organizational ethos, making change, and your ethos. Below is a summary of the four assignments. More detail is provided on the course blogs (Scupelli, 2015a; Scupelli & Hamilton, 2017).

Daily Measures Project

In the first assignment, students document photographically some aspect of their life for a week (e.g., plastic used, food eaten, waste produced, personal and cleaning products used, transportation, beverages ingested, and so forth). Students then categorize each action according to a value set that they are exploring. For example, are daily actions (a) sustainable or unsustainable? (b) Gender equal or not? (c) Patriarchal or feminist? Such questions about values force students to define the value set and operationalize it (Chapanis, Garner, & Morgan, 1963). They determine how to quantify and measure their definition of values (e.g., Shedroff, 2008). Students inevitably wrestle with larger questions such as sustainable for whom? Sustainable where? Sustainable when? Sustainable why? Sustainable how? Next, they are asked to ponder on what results from their actions. Finally, they are asked to describe the changes if any that they would like to make to their everyday behavior. Students often design something that might help them shift their behavior.

Organizational Ethos

In the second assignment, students look at case studies of companies hailed as industry leaders for the value set they are exploring (e.g., sustainability, gender equity). To have a strong and credible business perspective, the course relies on *Harvard Business School* articles. Students are asked to pick an example of a designed product or organization that they admire (or despise).

A list of articles are provided to students for companies such as 3M, Walmart, Patagonia, Method, Interface, Apple, Stonyfield, KKR, REI, NIKE, Herman Miller, Microsoft, Pepsi, BP, and IDEO. If students are uninterested in the companies listed, they are encouraged to suggest other companies they would like to research. Next, students determine their selected company's *ethos*. Students use Aristotle's definition of *ethos* in the means of persuasion in rhetoric as the character of the speaker (McKeon, 2001). From Aristotle's perspective, the character or ethos is focused on action in the world, not the stated values. In other words, what values are discernable from the way the organization operates? For Aristotle, to act is to know. To know and not act is to be in a state of *akrasia* (Kraut, 2017). The goal of the second assignment was to understand how their case study company is excelling at their value set (e.g., sustainability, gender equity). What are the models used to operationalize the values in question? How do they measure their actions in the world and how are they aligned to their stated values? The next step for the students is to develop a pitch to the company that proposes how the organization could take their leadership even further. In other words, how might the organization take their commitment to the values to the next level?

Making Change

In the third assignment, students evaluate the values and mission of an organization that students interact with on a daily basis. This assignment was introduced because the previous assignment was abstract for some students who felt very distant from the organizations they studied.

The goal of the third assignment was for students to feel agency over the proposals they made. Students sought to identify disconnects between stated values and action in the world. Examples of studied organizations to which the students belonged include academic departments, university administration, fraternities and sororities, and social student organizations. For example, students might identify contradictions in stated values such as sustainability but lack of action concerning such values in the everyday operations of their department.

Once students identified these contradictions between stated values and action, they proposed solutions. Students noticed that many organizations they observed could improve. Students identified key stakeholders that could help resolve the identified problems and proceeded to prepare their pitch. In several cases, the students made presentations to the key stakeholders and were able to have their solutions implemented. In other cases, the pitch was just delivered in class. Students learned to argue for their solution to a stakeholder who could concretely support the proposed solution. They reported feeling quite empowered by the exercise.

Your Ethos

The fourth project in the Design Ethos and Action course sought to have students articulate their professional ethos. In other words, what imprint did they want to leave on the world? This assignment encouraged students to focus on the kind of work they wanted to do and the kind of organization that they wanted to work for. Students made a mattering map of what mattered in their lives and to whom such things matter (Lowenstein & Moene, 2006). Students were surprised by the amount of freedom that they had concerning decisions about their future selves. Students found the exercise to be difficult because many of the questions that they were asking were new and required deep reflection on their part. Students currently looking for jobs and internships found that the exercise helped them prepare well for interviews and to better understand whether their values aligned with those of prospective employers. Some limitations included that they had limited understanding of professional practice. They decided that it would be particularly helpful to examine their professional ethos at critical junctures in their professional careers.

Dexign Futures

The Dexign Futures course focused on exploring the role of time in design. We use the term *dexign* to signify an experimental form combining *design thinking* with *futures thinking*. The distinguishing feature of *dexign* in our usage is the focus on aligning current action with long-term sustainability goals.

Figure 3. Dexign the Future course blog. All course materials are available here: https://dexignthefuture.com/ Image Courtesy of Learning Environments Lab.

Figure 4. Course blog for Introduction to Dexign the Future. All course materials are available here: https://dexignthefuture.wordpress.com/ Image Courtesy of Learning Environments Lab.

The current Dexign Futures course evolved from three courses developed between 2013 and 2016. The core idea for the course emerged while conducting research for the Design Ethos and Action course in fall 2011. Arnold Wasserman and I began to discuss the work that he was doing with his consulting firm, Collective Invention, around sustainability-related projects with the World Business Council of Sustainable Development (WBCSD). Those early conversations led to the co-development of the Dexign the Future (DTF) course in fall 2013 (Scupelli & Wasserman, 2013) (See Figure 3). In DTF, students were overwhelmed by the quantity of material necessary to engage meaningfully in futures thinking methods.

Hence, the Introduction to Dexign the Future course was developed to focus on design futures methods. Below are excerpts that describe the course (Wasserman, Scupelli, & Brooks, 2015[ab]). Figure 4 contains the course materials. More details are available in Scupelli, Wasserman, and Brooks (2016).

The iDTF course focused on six challenges the DTF course students encountered. First, students struggled to imagine the 2050 timeframe in a grounded way linked to existing global trends, establish believable benchmark goals, and articulate forces of change along decade-by-decade pathways. Second, students struggled to connect global forces of change described in the literature (e.g., WBCSD, IFTF) to the Pittsburgh region. Third, students struggled to interpret and articulate early signs in the present as future signals for 2050. Fourth, students struggled to create a believable three-generation persona family to articulate generational needs credibly grounded in 2050. Fifth, students struggled to discover and understand the materials forms, emotional needs, values, and alternative worlds imagined in 2050. And finally, students were challenged to deeply explore and communicate the interconnections between forces of change, three-generation persona families, and 2050 benchmark goals (Scupelli & Wasserman, 2014).

The iDTF course was organized as a seminar-studio course with readings, videos, discussion, and applied design assignments to introduce content necessary to understand global forces of change and provide practice applying such ideas. The course had four assignments: Alternative Worlds and Economies, Three-Generation Personas, Signs of the Times, and Sustainable Lifestyle Scenarios (see course materials: https://dexignthefuture.wordpress.com/).

In 2015-2016, Scupelli and Brooks, drawing on domain expertise from Wasserman, developed Dexign Futures Seminar (DFS)[3] to address some of the learning challenges described above. Through instructional activities, students gained exposure to key concepts with frequent practice and targeted feedback to build proficiency in identifying forces of change.

To deliver the DFS course, we used the Open Learning Initiative online (OLI) learning platform that supports pedagogical design best practices and collects data on student learning. This data (e.g., accuracy measures, engagement with course activities) provided insights as to what aspects of the course supported learning and areas to target for iterative improvement. More details on the Dexign Futures Seminar course are available in Scupelli, Wasserman, and Brooks (2016a, 2016b).

The DTF, iDTF, and DFS courses laid the groundwork for the Dexign Futures (DF) course, required for all third-year undergraduate design students. The Dexign Futures course described next focuses on aligning near-term design action with longer time horizons aimed at sustainable futures. Previously, I described some of the challenges that emerged in teaching with traditional studio pedagogy in DTF, and using mixed seminar/studio pedagogies in iDTF, and the relative successes with the flipped classroom pedagogy experimentally used in DFS. These empirical results led me to pursue the flipped classroom pedagogy in the Dexign Futures class (Scupelli, Brooks, & Wasserman, 2016b).

Flipped courses shift lectures and instruction outside of class while reserving class time for hands-on activities. Online homework helps students to prepare for in-class activities and provides immediate correctness feedback to all students. Such interactive activities

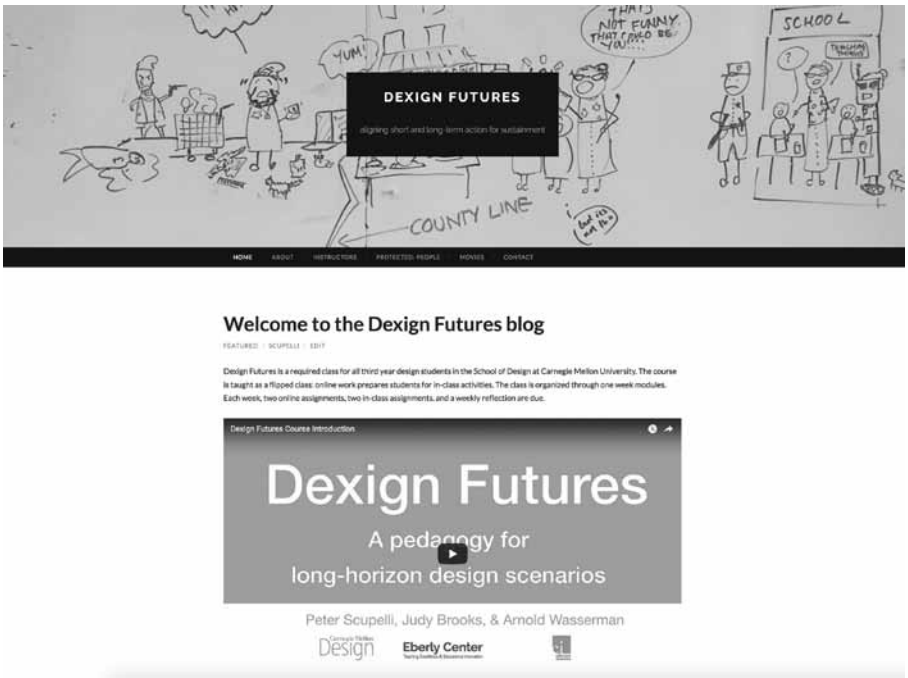

Figure 5. The Dexign Futures course blog. Descriptions of the course materials are available here: https://dexignfutures.com/ Image Courtesy of Learning Environments Lab.

seek to engage students in active learning activities to prepare for class. During in-class activities, the course instructor and teaching assistants can provide students with feedback and answer questions.

Likewise, in-class team activities and peer feedback can enhance student learning by forcing students to engage in applying the course materials to a design problem. Challenges of flipped classroom pedagogy involve an incredible amount of work required of course instructors to prepare online activities with online interactive feedback and in-class activities that can be completed in class. Furthermore, if students are turning in classwork daily, instructors and teaching assistants must relentlessly grade and provide feedback.

The Dexign Futures course is organized around four units. Each unit has weekly topics. The Dexign Futures flipped course has two main parts: (a) online components that serve as homework to prepare for (b) in-class workshop activities. The class meets twice a week for 80-minute sessions (See Figure 5).

The Dexign Futures course covers different approaches to constructing and interpreting futures, ranging from extrapolations of trend forecasting, through risk assessments of

alternative scenario planning, to attempts to connect the present with desirable normative futures, through backcasting and pathways of change. Students explore the future through narratives of utopian and dystopian scenarios and learn to create more useful design-actionable futures. Students learn to identify "weak signals" and "early signs" in the present and to abstract forces of change that indicate likely future design spaces. Students also attempt to evaluate forces of change in terms of their longer-term consequences so as to align short-term design action with desirable longer-term time scenarios. The four main modules in the Dexign Futures course are Futures Narratives and People, Critiquing Alternative Futures Scenarios, Critiquing Normative Futures Scenarios, and Making Experiential Futures. The main modules are subdivided into weekly assignments and in-class activities. More details on the course are available in Scupelli, Brooks, & Wasserman (2016a, 2016b).

In the section that follows, I describe how the three courses Design Agility: Speak Lab, Design Ethos and Action, and Dexign Futures helped students develop the basic skills necessary to engage with aspects of Transition Design. I use three questions to frame the student learning experiences: scope of the design experience, necessary methods and craft, and becoming a new type of designer.

Scope of Design Experience

What meaningful design project experiences might there be that allow undergraduate students to experience systems-level change for the societal-level transition towards sustainable futures? Next, I compare the pedagogical experiences of the three courses Design Agility: Speak Lab, Design Ethos and Action, and Dexign Futures as they relate to practicing Transition Design.

In Design Agility: Speak Lab, students learned three fundamental skills to engage with societal-level wicked problems: (a) to frame a wicked problem in relation to an audience affected by the societal-level issue; (b) to find organizations interested in solving the problem; and (c) to create a presentation seeking funding to work on that specific societal issue.

In the Design Ethos and Action course, students learned to imagine themselves as design-based agents of change within their own design practice. Students practiced proposing values-based design outcomes to organizations within a framing that resonates with the specific target audience. For example, if a business cares about financial returns, an argument might be made that furthers sustainability values but that includes financial measures in a compelling way.

In the Dexign Futures course, students learned to find design opportunities within futures thinking methods. They also learned to frame short-term design actions with long-term vision goals. The Dexign Futures course opened up the space of design to include four layers from causal layered analysis (CLA), ranging from the everyday action around artifacts, expert opinion, worldview, and myths and metaphors (Inayatullah, 1998).

As is clear from the three courses, students had plenty of practice opportunities to pitch their design concepts in the three courses described. In the Design Agility: Speak Lab course, students learned to quickly find stories within societal-level problems that could

be funded. In the Design Ethos and Action course, students practiced articulating and measuring values for organizations. In the Dexign futures, they became confident in translating abstract futures thinking methods into concrete design contexts while aligning short-term action with long-term goals. In all three courses described, students emerged with a broader scope of what it means to design.

Methods and Craft for Transition Design Projects

What minimum level of Transition Design pedagogical experience might allow students to engage with making for societal-level change? First, design students might have to expand their definition of what making means to go beyond making of physical artifacts. In other words, what design methods and artifacts do students need to learn to make to redirect their design practice to engage in pursuing societal-level sustainability?

In the Design Agility: Speak Lab, students were tasked with moving past the paradigm of design as limited to craft and artifact making. Students were asked to imagine the impact of designed experiences within complex societal challenges. Students wrestled with the question: What is the first step in solving a wicked problem for a specific audience compared to the temptation of a one-size-fits-all generic design solution? In other words, how might they shift from "problem solving" to "problem finding" and strategic design action. In this class, students practiced using specific methods to map societal-level problems and find leverage points within everyday experience for a specific audience.

In the Design Ethos and Action Course, students became very skilled in articulating how values could be measured within an organization and how such values played out within a complex system for multiple stakeholders (e.g., customers, workers, management, local communities, the environment). The fundamental shift for students occurred when they developed methods to connect values to designed artifacts, organizations, communities, and the broader environment.

In the Dexign Futures course, students learned to apply specific futures thinking methodologies to design problems. Students developed methods that built upon the novelty of futures thinking methods to inform the strengths that they brought from a design perspective. For example, Jim Dator's four generic futures allowed students to imagine four different futures (Dator 2009), but their ability to visualize a day in a life of a person in such scenarios made the scenarios easier to understand and imagine. In short, students were able to link multiple STEEP forces of change (social, technological, economical, environmental, political) that shape the broader context in which everyday life takes place. This is an example of representing how aspects of everyday experience are linked to broader systems-level challenges. The focus of the Dexign Futures course is to link the present time with future visions set in future long-time horizons. Students learn to interpret futures signs (Hiltunen, 2008) in the present that provide clues about plausible futures. The futures signs in the present are then linked to benchmark goals in the future along a pathway of change. Along the pathway of change, decade-by-decade milestones and barriers are mapped (WBCSD, 2009).

As is clear from the examples in the three courses above, in the Design Agility: Speak Lab students shifted from human-centered and customer-centered design to a broader perspective of design methods that considered multiple stakeholders and multiple levels of intervention. In the Design Ethos and Action course, students learned to shift their design practices to align with values-driven design. This required the development of new design methods and a revised conception of the links between their personal values and their professional practice. In the Dexign Futures course, students learned specific futures thinking methods that allowed students to align short-term action with long-term vision goals.

On Becoming a New Type of Designer

What design skills are necessary to help students learn to transition coalitions of unwilling people, groups, organizations, and public policies? Design students often get stuck in a mindset of designer as a "service provider", waiting for a client to approach them with a framed design problem. In short, designers solve design problems that the client brings to them. In the three courses described, finding a design problem worth solving is part of the assignment. For example, in the Design Agility: Speak Lab course, students began investigating a societal-level problem and mapping the stakeholders involved and affected before knowing who their client might be. They found an organization that had the expertise they needed and went on to find funding sources to work on their framing of the design problem. This is the complete opposite of the mindset of designer as service provider for a corporate client. Students at first were confused by the challenge to find a design problem worth solving, but they quickly became excited by the challenges of framing and solving such higher-level challenges.

In the Design Ethos and Action class, students went from thinking that design practice was fixed to understanding that they can redirect their design practice to reflect their own values (Fry, 2008). They made connections with how their values play out in everyday life, in organizations, and in professional practice. Students realized that it was their responsibility to develop a plan for how they wanted to be in the world as individuals, families, groups, and professionally. In short, they began to see themselves as value-based actors on multiple levels ranging from individuals to groups, organizations, and communities.

In the Dexign Futures class, students shifted their thinking about time in design from a single point in time to imagining how designs may play out over time for the past, present, and future. The shift from imagining only one short-term future to imagining processes that link instances in the present to multiple futures opened new opportunities for thinking and acting as designers. Students found that considering alternative futures opened up the design space they considered.

As is clear from the examples for the three courses described in this section, students shifted their ideas of what it means to be a designer from an artifact-based paradigm to a broader systems perspective necessary for parts of Transition Design. In the Design Agility course, students most radically learned to shift from designer as service provider to designer as finder of a problem that is worth solving. They also learned to create coalitions of stakeholders interested in funding and solving societal-level problems. In the Design

Ethos and Action course, students learned to align their values with their desired design practice. In the Dexign Futures class, students began to imagine their design action having a temporal dimension. They began to learn to imagine how design in the short-term can lead to longer-term design visions.

Summary

In this paper, I've described how the field of design is changing in general and, in particular, how design education needs to change to accommodate emerging design fields such as Transition Design. I provided examples from three courses that I developed and taught at the School of Design at Carnegie Mellon University: Design Agility: Speak Lab, Design Ethos and Action, and Dexign Futures. Three themes emerged from reflecting on the student experience in those courses. First, expand the scope of the students' design experience compared to that provided in traditional pedagogy. Second, introduce new methods and making skills needed to work on Transition Design-type projects. Third, provide students with learning experiences that allow them to re-imagine what it feels like to be a new kind of designer working on larger types of design projects that are rooted in the craft of making. Transition Design is a new field of design. In this paper, I have addressed three courses and some sub-skills that I posit are necessary for the field that is being constituted around Transition Design.

Notas

1. The term *dexign* with an X was introduced by Arnold Wasserman in 2013 to describe an experimental form of design that combines *design thinking* with *futures thinking*. The distinguishing feature of *dexign* is the focus on aligning current action with long-term sustainability goals.
2. In 2015, the DEA course was taught by (a) Peter Scupelli at the School of Design at Carnegie Mellon University, in Pittsburgh, PA, USA, (b) Marty Siegel and Jordan Beck at Indiana University, Bloomington, IN, USA, and (c) Beena Prabhu and Naveen Bagalkot at the Srishti School of Art, Design and Technology in Bengaluru, India. Students from the three institutions provided each other with feedback on their assignments. The exchanges between the different cohorts allowed students to see their works from different cultural perspectives. In 2017, the DEA course explored sustainability, feminism, and gender equality. It was co-taught by Peter Scupelli and Dr. Kate Hamilton from the Eberly Center of Teaching Excellence at Carnegie Mellon University. Dr. Hamilton was the course instructor for feminism and gender theory as it relates to design. Course materials are available: https://designethosandaction.wordpress.com/ https://designethosaction2017.wordpress.com/
3. DFS is an Open Online Course offered through Carnegie Mellon University Open Learning Initiative (OLI). OLI content prepares students for workshop activities to apply the theoretical ideas practically to concrete design problems.

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Resumen: Los educadores de diseño luchan por enseñar habilidades básicas en los cursos de diseño tradicional necesarias para la práctica del Diseño para la Transición. El cambio a nivel de los sistemas del Diseño para la Transición, hacia una sociedad sostenible, plantea tres desafíos: (a) ¿Qué experiencias de diseño preparan mejor a los estudiantes para participar en cambios a nivel de los sistemas para futuros sociales sostenibles? (b) ¿Qué podría ser un proyecto de Diseño para la Transición acotado a un curso de estudio de un semestre de duración? (c) ¿Qué habilidades de diseño se necesitan para facilitar distintas coaliciones humanas que busquen la sostenibilidad social? En este documento, describo ejercicios fundamentales para desarrollar habilidades de diseño, introducidas en tres cursos de diseño, para preparar a los estudiantes para los desafíos del tipo de Diseño para la Transición.

Palabras clave: Pedagogía de diseño - Diseño para la Transición - diseño basado en valores - *ethos* de diseño - agilidad de diseño - futuros del *dexign* - pensamiento de futuros - diseño de horizonte de corto plazo - diseño de horizonte de largo plazo - diseño temporal alineado.

Resumo: Os educadores de design lutam por ensinar habilidades básicas nos cursos de design tradicional necessárias para a prática do Design para a Transição. A mudança ao nível dos sistemas do Design para a Transição até uma sociedade sustentável propõe três desafios: a) Que experiências de design preparam melhor aos estudantes para participar em mudanças ao nível dos sistemas para futuros sociais sustentáveis? b) Qual poderia ser um projeto de Design para a Transição limitado a um curso de estudo de um semestre? c) que habilidades de design se precisam para facilitar diferentes coligações humanas que procurem a sustentabilidade social? Neste trabalho se descrevem exercícios fundamentais para desenvolver habilidades de design, introduzidas em três cursos de design, para preparar aos estudantes para os desafios do tipo de Design para a Transição.

Palavras chave: Pedagogia do design - Design para a Transição - design baseado em valores - ethos do design - agilidade de design - futuros del *dexign* - pensamento de futuros - design de horizonte de curto prazo - design de horizonte de longo prazo - design temporal alinhado.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Transition Design and Ecological Thought

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Abstract: Multiple findings across various sciences have demonstrated the complexity of human-nature relations and exposed the limitations of normative philosophical traditions that discount, dismiss, or even deny the importance of life-sustaining processes that enable human existence. This paper reviews historical and contemporary ecological thought as a basis for Transition Design. Ecologically engaged design presents profound challenges to a variety of assumptions embedded in design cultures. Associated tensions are explored in this paper along with some of the ways that ecologically literate Transition Design can drive the creations of sustainable futures.

Key words: ecological thought - complexity - ecology - epistemological error - ecological literacy - modernity - sustainability - Anthropocene - Capitalocene - Ecocene.

[Abstracts in spanish and portuguese at pages 147-148]

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Over the past half century, the ecological and Earth sciences have revealed the complexity, vitality, and fragility of the global ecological context. Transition Design is informed by this new more integrated understanding of the complexity of human-nature relationships than by the formulations that unpinned the Industrial Revolution and the modern era. Over the past five decades, individuals in diverse fields have contributed to the development of an ecological theory that can better meet the challenges associated with increasingly severe eco-social problems, including climate change. This ecologically engaged worldview recognizes the limitations of philosophical traditions that discount, dismiss, or even deny the importance of life-sustaining processes that enable human existence. With

this perspective, designers can more effectively address complex problems. This paper reviews historical and contemporary ecological thought as a basis for Transition Design, describes the tensions ecological thought presents to neoliberal frameworks, and explains some of ways that ecologically literate Transition Design can drive the creations of sustainable futures.

The Emergence of Ecology and Ecological Thought (Pre-1960)

Ecology (from the Greek *oikos*, "household") is the study of relations (in the household that is the Earth). The term ecology was coined by German biologist, philosopher, and artist Ernest Haeckel (1839-1919) in 1866 as a "science of habitat". Haeckel's drawings of embryos, plants, and microscopic life forms illustrated his scientific findings, philosophical ideas, and his own visual interpretations of these findings. As an artist-scientist, Haeckel linked the study of ecology with images from its conception, and images have remained a powerful means for capturing ecological knowledge and systems thinking ever since. The new science of ecology emerged as biologists began to study communities of organisms, and the biologists' focus shifted from the individual to groups in an environment. This study required new ways of thinking about relationships, connectedness, patterns, and context. This expansive focus revealed principles that life uses to organize its processes. Some notable features include "the double role of living systems as parts and wholes" that require "the interplay of two opposite tendencies: an integrative tendency to function as part of a large whole, and a serf-assertive, or self-organizing tendency to perceive individual autonomy" (Capra & Luigi Luisi, 2014, p. 65). Another key feature includes the tendency to make multileveled structures of systems within systems: "life is an integrated process of nested living systems" (Feibleman, 1954; Günther & Folke, 1993, p. 257). These and other principles of ecology inform ecological theory described in this paper.

Unfortunately, but perhaps unsurprisingly considering the historical context, the new discipline was immediately used in racist ways with attempts to categorize, characterize, and arrange races in hierarchal orders such that "differences of culture or power become expressions of an order of nature" (Wark, 2015, p. 139). The concept of ecology was harnessed to serve the racist assumptions of the privileged White men who were in positions of power in the society in which the concept was conceived and developed. These totalizing interpretations of ecological science developed "a biopolitics whose apogee is the Nazi concentration camp" (Morton, 2017, p. 34). The German Third Reich had elements of a reactionary green movement and used references to nature to promote the Aryan race as the master race. The ways in which references to nature can be linked to racist and sexist political projects remain a warning for everyone who references nature today.

Despite these problems, ecology as a branch of science that focuses on the environment has become an important field of study in an increasingly complex world. The focus on environments has created new ways of thinking about communities and networks, as well as new understanding of how life organizes itself as complex adaptive systems. Ecologists study *relationships* between human and nonhuman nature, including organisms, parts of organisms, and communities of organisms. These living systems are organized as net-

works within networks. Complexity science informs ecological theory and systems thinking. It reveals relationships and patterns where nonlinear dynamics "embodies a shift in perspective that is characteristic of systems thinking –from objects to relationships, from measuring to mapping, from quantity to quality" (Capra & Luigi Luisi, 2014, p. 99). These ideas are foundational to ecological thought's concern with addressing fragmenting and overly reductive perspectives of previous ways of thinking.

In the early 20th century, quantum physics provided insights into observation and perception, participation, relationships, and influences. The scientific findings that an observer is a participant within a process of knowledge-making demonstrated errors with the old subject/object dualism of traditional scientific methods. But the revolution implied by these discoveries has not yet, even a century later, been fully embraced and embedded in all disciplines and practices. Although science suggests that we live in a participative universe that is so complex that it must be approached with methods responsive to this complexity, the study of ecology has been dominated by positivist methodologies (Sachs, 2010, p. 30). These methods have led to the development of ecosystems theory as a science of feedback mechanisms with the goal of understanding and ultimately controlling natural processes. This reductive and instrumental approach to ecology continues with projects such as the financialization of the nature agenda of the United Nations' Environment Program (UNEP) Green Economy. Here, ecology functions to monitor nature's overload capacity and adjust feedback mechanisms to enable continued development. Two distinct approaches to ecology can be identified: (a) one in which nature is conceived as resources to be managed and (b) one in which ecology is approached as a science of complexity and is often associated with a participative worldview oriented toward preserving the commons. Ecological thought as presented in this paper is associated with the second approach.

Early Ecological Thought, 1960-2000

Ecological thought refers to the ways in which ecology has informed new ways of thinking about relationships, commonality, and complexity. Although there are a variety of formulations of ecological theory, a dominant theme is a critique of the objectivist, positivist, reductive, and dualist tradition of modernity and some of what is referred to as postmodernist thought. These philosophical traditions have their origins in the traditions of empiricism, rationalism, and mechanism in the scientific revolution. For many ecological theorists, these traditions are valuable but incomplete approaches to knowledge. Ecological theorists describe the processes through which knowledge is generated in positivist science as responsible for a dualist split (between subject and object, sensing and thinking, mind and body, humankind and nature) that results in a conception of nature as a series of mechanical and inert objects. For these reasons, some ecological theorists refer to postmodernity as "hyper-modernity" or "ultra-modernity" (Griffin, 1992; Sterling, 2003, p. 222). These authors claimed that a better critique of modernity "would counter the modern ideological flight from body, nature, and place" (Spretnak, 1997, p. 223). This position asserts that modernity "denies the ecological by placing itself both outside of

nature and in control of nature, while ultra-modernism denies the ecological by focusing exclusively on the social" (Boehnert, 2018a, p. 55). The proposal is to engage with the ecological domain –not by rejecting what came before but by enveloping it in more inclusive ways of knowing.

Feminist and ecofeminist historians, philosophers, and activists have described how traditional conceptual frameworks justify the industrial exploitation of certain classes, races, and genders of people and the planet. Modernity's conception of the world takes the regenerative capacities of nature for granted and exploits natural resources until the regenerative capacities of nature are severely eroded. Ecofeminists describe a logic of domination that has been historically been used to oppress women and nature. Val Plumwood (1999) explained: "Injustice does not take place in a conceptual vacuum, but is closely linked to desensitizing and othering frameworks" (p. 197). Plumwood (2002) described "a crisis of reason" that is propelled through backgrounding, remoteness, instrumentalization, and disengagement. Ecofeminists and feminists helped reveal the error of presenting knowledge as universal and value-free by demonstrating how women's and nature's interests have been denied using these frameworks. These authors advocated more situated and caring approaches to relating to each other and the Earth. These contributions have been central in the development of ecological thought.

Ecological theorists have sought to revise contemporary understanding of human–nature relations in various ways. The deep ecology school of thought, founded by Arne Naess (1912-2009) in the 1970s in Norway, emphasizes distinctions between shallow ecological thinking (anthropocentric) and deep ecological thinking (where humans are understood as part of a web of life and as fundamentally interconnected with the ecological context). Meanwhile, in the United States, Murray Bookchin (1921-2006) founded the social ecology movement that linked ecological thinking to critical theory such that all environmental problems are approached as socioecological problems (White, Rudy, & Gareau, 2015, p. 27). Over the last 40 years, these two prominent schools of thought have often had intense disagreements, and yet both have profoundly challenged mainstream environmentalism and pushed ecological theory and practice into more intelligible directions.

An underappreciated but significant theorist from this early period is Gregory Bateson (1904-1980). Bateson was an anthropologist who laid a foundation for contemporary ecological theory with his *Steps to an Ecology of Mind* (1972). Bateson described fundamental errors in human ways of conceiving of ourselves in relation to ecological context. This epistemological error is at the root of our inability to engage with the complexity of contemporary problems. The consequences are severe. Bateson (1972) stated:

> I suggest that the last 100 years or so have demonstrated empirically that if an organism or aggregate of organisms sets to work with a focus on its own survival and thinks that is the way to select its adaptive moves, its "progress" end up with a destroyed environment. If an organism ends up destroying its environment, it has in fact destroyed itself. (p. 457)

The error determines that humankind effectively ignores information vital for our own survival. This ignoring enables the destruction of the conditions that humankind needs

to sustain itself. This error is evident in approaches to knowledge that serve instrumental ends to serve immediate human desires, often with a complete denial of the consequences for the ecological context.

Bateson's ideas were used by Felix Guattari in his own formulation of ecological (and cultural) thought in The Three Ecologies (published in French in 1989 and translated into English in 2000). Following Bateson, Guattari described mental ecology, social ecology, and environmental ecology as three realms that cannot be disconnected. The three ecologies (the mental/human subjectivity, the social/social relations, and the environmental) must be encountered simultaneously in theory and practice. A fragmenting approach to knowledge only creates endless contradictions. Guattari (2000) observed:

> So, wherever we turn, there is the same nagging paradox: on the one hand the continuous development of new techno-scientific means to potentially resolve the dominant ecological issues and reinstate socially useful activities on the surface of the planet, and, on the other, the inability of organized social forces and constituted subjective formations to take hold of these resources in order to make them work. (p. 22)

This paradox creates crises in all three spheres. In response to this problem, Guattari (2000) proposed a new theory of ecosophy, an "ethico-political articulation" (p. 19), that "create[s] new systems of valorization, a new taste for life, a new gentleness between the sexes, generations, ethnic groups, races" (1995, p. 92). This theory of relations between the self, the social, and the environmental is a useful model for designers who typically work creating design outcomes that mediate experiences between these three domains.

Guattari brought ecology together with culture. With the recognition that culture is always implicated in the development of subjectivities, he called for communicational interventions for the reinvention of the ways in which we live by "the motor of subjectivity" (1995, p. 24). This appeal for attention to the production of subjectivity is relevant for all cultural workers concerned with eco-social problems. Cultural practitioners can nurture a new praxis to "ward off, by every means possible, the entropic rise of a dominant subjectivity" (Guattari, 2000, p. 45) associated with reproducing environmental harms. Guattari invited all cultural practices "in a position to intervene in individual and collective psychical proceedings" (2000, p. 27) to cultivate a new ecological subjectivity. This revolution must engage with the "domains of sensibility, intelligence and desire" (2000, p. 20). Guattari's psychological and sociological analysis of the ways in which culture works to influence subjectivities can help designers understand how they can work to nurture ways of thinking and acting to enable sustainable transitions.

Ecological Literacy

David Orr published the seminal book Ecological Literacy in 1992 in which he introduced the concept of ecological literacy (or ecoliteracy) as a foundation for sustainable education. In this text, Orr (1992), like Bateson, described ecological problems as linked to how we think:

> The disordering of ecological systems and of the great biogeochemical cycles of the earth reflects a prior disorder in the thought, perception, imagination, intellectual priorities, and loyalties inherent in the industrial mind. Ultimately, then, the ecological crisis concerns how we think and the institutions that purport to shape and refine the capacity to think. (p. 2)

Ecologically literacy describes a type of education dedicated to shifting mindsets to support ecological imperatives. Daniel Wahl (2016) described ecoliteracy as an "understanding of the organization of natural systems and the processes that maintain the healthy functioning of living systems and sustain life on Earth ...[and the ability] to apply this understanding to the design and organization of human communities" (p. 154).
Ecoliteracy involves an understanding of the basic principles of ecology and the development of the various capacities needed to help integrate these ideas into the design and development of sustainable everyday ways of living. Emma Dewberry (2016) emphasized ecological literacy as supporting new agencies:

> Ecoliteracy represents a shift in (the industrialized) mind-set that asks people to understand the fundamental role of natural systems and the relationship between their own well-being and the health of those natural systems. It is not only the theoretical underpinning of the interconnectedness of systems that is important but also the value of action-oriented ecoliteracy. (p. 4)

Sustainable transformations depend on work developing cognitive, critical, perceptual, and social capacities to design ecologically sustainable ways of living. Along with ecological knowledge, an ecologically literate culture must learn to organize cultural, political, legal, and economic priorities in ways that will enable it to sustain itself over time.
The ecoliteracy concept can be characterized as evolving in two complementary directions that emphasize different approaches to sustainable transitions. An experiential mode of ecoliteracy draws insights from philosophy and holistic science and provides "a conceptual foundation for the second mode, which in turn has greater capacities to critique and transform unsustainable institutional practices" (Boehnert, 2018a, pp. 80-81). For children and adults, this approach emphasizes "a dimension of ecological understanding that has to be subjectively embodied and adapted to the particular local conditions of natural processes in which we participate" (Wahl, 2016, p. 87). This tradition has been popular outside formal education.
A second mode of critical ecological literacy has a sharper sociopolitical critique. In the context of a deeply unsustainable culture, individuals need critical skills that enable the identification of the forces that reproduce the unsustainable and the development of new agencies to enable transformative work. Engagement with the controversies and politics of change-making are a basis for the critically engaged ecological literacy. Not everyone who is interested in presenting themselves as committed to sustainability is familiar enough with ecological concepts and critical approaches that enable an integrated analysis of environmental problems. Those pushing forward ecological transitions need analytical skills to approach economic, political, and cultural issues critically to understand how

they intersect with environmental harms and injustices. Media literacies of various types are needed to decode how environmental ideas are embedded in images, news, metaphors, myths, cultural stories, digital media, infographics, charts, and designed artefacts. Critical thinking helps individuals identify misinformation in cultural messaging. Ecological literacy education must help individuals develop a variety of new agencies to do the often-difficult work of disrupting the unsustainable status quo.

Contemporary Ecological Thought (2000-2018)

Anthropocene, Capitalocene, and Ecocene

A historical moment occurred in 2000 in the middle of a heated debate on human impacts on the Earth at a scientific conference in Cuernavaca, Mexico. In *The Shock of the Anthropocene,* Christophe Bonneuil and Jean-Baptiste Fresso (2016) explained what happened:

> Paul Crutzen, an atmospheric chemist and Nobel Prize winner for his work on the ozone layer, stood up and exclaimed: "No! We're no longer in the Holocene but in the Anthropocene!" This was the birth of a new word, and above all of a new geological epoch. Two years later, in an article in the scientific periodical Nature, Crutzen developed his assertion further: the stratigraphic scale had to be supplemented by a new age, to signal that mankind had become a force of telluric amplitude. After the Pleistocene, which opened the Quaternary 2.5 million years back, and the Holocene, which began 11,500 years ago, "It seems appropriate to assign the term 'Anthropocene' to the present, in many ways human-dominated, geological epoch". (p. 16)

Crutzen and other scientists describe the Anthropocene as a new geological epoch where humankind has become a force that is dramatically changing the ways Earth systems operate (Crutzen, 2002; Steffen et al., 2015). The Anthropocene concept has gained cultural currency as a scientific description of what is occurring as Earth systems are being transformed and destabilized by human activities. Bonneuil and Fresso's book questions who is allowed to speak about the Anthropocene and challenge the monolithic scientific discourse. Critics have warned that although the Anthropocene concept can work as a scientific descriptor of the current epoch, the era defined in scientific terms does not capture the social forces that drive change in society and ultimately the environment. What is needed is not only descriptions of environmental changes but also ideas and ways of thinking that will enable appropriate responses, on a scale that will make a difference.

The Anthropocene concept has been critiqued as uncritically importing Western rationality, imperialism, and anthropocentrism –assumptions that all narrow humankind's options for developing sustainable alternatives (Haraway, 2015, 2016; Malm, 2015; Moore, 2014, 2015). Critical theorists argue that responsibility for ecologically destructive modes of development is not distributed evenly across humanity but is concentrated on those who have greater power. Bruno Latour (2014) claimed:

> The "anthropos" of the Anthropocene is not exactly any body, it is made of highly localised networks of some individual bodies whose responsibility is staggering...this dispersion of the "anthropos" into specific historical and local networks, actually gives a lot of weight to the other candidate for naming the same period of geohistory, that of "capitalocene", a swift way to ascribe this responsibility to whom and to where it belongs. (p. 139)

The Capitalocene concept draws attention to a specific model of development. Capitalism is a project developed during an era when nature's regenerative processes were taken for granted. Capitalism was not designed to value the human/social and ecological domains. What it does instead is transform these realms into the types of capital that can contribute to the accumulation of financial capital (for those who have capital to invest). This analysis highlights the role of capital accumulation in driving environmental problems. As a system developed during an epoch when the Earth's needs were dismissed, capitalism functions without regard to its own social and environmental context. Jason Moore (2014, 2015) claimed that the Anthropocene concept obscures these systemic processes that drive ecological crises. As analysis of the problem is bound to effective responses, the naming (and framing) of the current epoch matters.

While the Anthropocene describes changes to Earth systems and the Capitalocene describes why these changes are happening, what is urgently needed now are visions of how humanity will respond. At the Urban Ecologies design conference in Toronto in June 2015, design theorist Rachel Armstrong (2015) announced: "There is no advantage to us to bring the Anthropocene into the future. The mythos of the Anthropocene does not help us. We must re-imagine our world and enable the Ecocene". The Ecocene is a generative concept that provides a conceptual space for redirected, responsible, and regenerative design. The Ecocene will be generated by those well versed in the scientific knowledge of the Anthropocene, the critical perspective of the Capitalocene, and in design skills to make new communication, products, fashion, services, and spaces to sustain civilization over time. The people who design the Ecocene will be ecologically literate. They will have an ontology, epistemology, and ethic emerging from ecologically engaged ways of knowing.

New Formulations of Ecological Thought

In the context of clear warnings from scientific communities on the risks associated with Earth system destabilization and the announcement of a new geological epoch, the 21st century has seen an acceleration of articulations of ecological theory. Many of these new ideas respond to the failures of anthropocentric, reductionist, and instrumentalist ways of understanding the world. Reductionist approaches to knowledge are described as erasing complexity such that "knowledge gains in rigour what it loses in richness" (Santos, 2007, p. 27). Although there are differences in emphasis and some disagreement, the common vision of the vast majority of ecological theory asserts that "knowledge gained from observation of the parts [alone] is necessarily distorted" (Santos, 2007, p. 28). This perspective has created a foundation for the development of more inclusive and participatory

approaches to knowledge generation and a more radical scope for action based on an ecologically engaged way of knowing.

Twenty-first-century theorists have constructed formulations of ecological theory that engage concepts such as complexity, solidarity, commonality, and vitality. Donna Haraway (2016) asked: "What happens when human exceptionalism and bounded individualism, those old saws of Western philosophy and political economics, become unthinkable in the best sciences, whether natural or social?" (p. 30). Haraway described troubling the many contradictions generated by eco-social breakdown to nurture well-being on a damaged planet toward enabling multispecies recuperation. Along similar lines, Timothy Morton (2017) mapped antioppressive approaches to ecological theory by describing a mode of "solidarity with nonhuman people." Morton (2017) unpicked humans and nonhumans relations and described how antiracist struggles relate to environmental ones:

> The struggle against racism thus becomes a battleground for ecological politics. "Environmental racism" isn't just a tactic of distributing harm via slow violence against the poor. Environmentalism as such can coincide with racism, when it distinguishes rigidly between the human and the nonhuman. Thinking humankind in a non-anthropocentric way requires thinking humankind in an anti-racist way. (p. 45)

Similar to Haraway, Morton troubled ecological theory in ways that suggest that addressing environmental problems is linked to new capacities for solidarity and allyship.

Morton's (2007) *Ecology without Nature*, Jerediah Purdy's (2015) *After Nature*, and other texts called for a move beyond the concept of nature due to the terms historical associations with authoritarian constructions on the natural and linked the various types of oppression of humans and exploitation of the ecological. Purdy (2015) described a posthumanist worldview that understands "the ethical complacency that enables humans to remake and destroy nonhuman worlds" (p. 274). I think the concept of nature does not have be abandoned with anthropocentric humanism. In the context of a society that has consistently and systematically denied the value of the environmental, we need more words to talk about nature (rather than fewer words). These words must include words (like nature) that are not anchored to science (like ecology). Instead, we can reject the erroneous ways that nature has been conceptualized. For example, one of the problems with some new theory on the environment is the idea of a new "entanglement" as the merging of the natural and the artificial (Ito, 2016). I have described elsewhere why this market-facilitating concept is "an error of order and value" (Boehnert, 2018a, p. 96). Whether we chose to use the word nature or not, the critique against the wide variety of ways that the concept of nature can used in oppressive ways is foundational for justice-oriented ecological thought.

Black feminist interventions further trouble ecological theory in ways that disrupt environmental studies frameworks and offer alternative conceptions of ecological ethics (Frazier, 2016, p. 40). Chelsea Frazier (2016) argued for de-stabilizing and reshaping the hierarchies, classifications, and "visual, spatial and philosophical assumptions" (p. 69) beyond "hierarchical myopia and politics of exclusion that have plagued environmental

discourses" (p. 68). She described Black feminist theory as emerging from an experience of being relegated to an "illusory subject/object status [that] has always already paved the way for their extreme instrumentalization" (2016, p. 69). Drawing on political theorist Jane Bennett's (2010) vital materialism, with its commitment to commonality and vitality or aliveness of all matter, Frazier (2016) advocated for a vital materialist stance as superior to an environmental one (p. 68). Frazier (2016) troubled the new materialist position, as informed by the Black experience of "discursive objectification" (p. 69). In the tradition of ecofeminists, Haraway, and Morton, Frazier linked the experience of human oppression to exploitation of nonhuman nature. In its most emancipatory formulations, ecological thought links ecoism to racism, sexism, and other oppressive ideas, behaviors, and system structures.

Tensions and Controversies with the Ecological

Despite advances in sustainability sciences and environmental movements, risks associated with climate change and other environmental problems continue to accelerate. As a civilization, we are not currently effectively responding to environmental imperatives. Government policy on issues of the environment in the United States and the United Kingdom has suffered major setbacks over the past decade. Environmental groups claim that international biodiversity and climate negotiations have not resulted in adequate, legally binding legislation at the major United Nation environmental conferences Rio+20 (2012) or COP-21 Paris (2015). Design has a role to play in sustainable transformations, but ultimately, the potential for design to leverage its full potential depends on the political context in which design is situated. Structural factors enable or disable sustainable transformations.

Climate change and other severe environmental problems are indisputable within scientific circles –but not in the policy arena of the current U.S. government. Corporate environmental messaging offers what is presented as solutions to environmental problems often without rigorous scrutiny of key claims. Environmental theory is political and controversial. This was evident when the postenvironmentalists in the Breakthrough Institute (BTI), led by Ted Nordhaus and Michael Shellenberger, published *An Ecomodernist Manifesto* (2015). Bruno Latour (2015) was not impressed:

> Never in history was there such a complete disconnect between the requirements of time and space, and the utopian uchronist vision coming from intellectuals. Wake up you ecomoderns, we are in the Anthropocene, not in the Holocene, nor are we to ever reside in the enchanted dream of futurism.

Others offered even more scathing responses: "there is nothing really 'eco' about ecomodernism, since its base assumptions violate everything we know about ecosystems, energy, population, and natural resources" (Caradonna et al., 2015, p. 16). For many sustainability scholars, "eco-modernization is an oxymoron" (Kallis, 2015), but to those who are unfamiliar with the complexities associated with meeting environmental challenges, the

ecomodernist position can appear like a perfectly rational way forward. Ecomodernist and technofix (technological fix) discourses continue to dominant thinking in the media and in politics with the result that environmental problems are never adequately addressed.
Ecomodernism is an entrenched position aligned with neoliberalism. Neoliberal modes of governance result in a type of politics that dismantles democratic social institutions in favor of unaccountable private power. It is characterized by policies favoring marketization, metrics-driven modes of governance, financializing, privatization, deregulation, and reregulation facilitating market processes with benefits for the most powerful actors (Arsel & Buscher, 2012; Castree, 2008; Peck, 2010; Sullivan, 2013). These radical transformations are accompanied by rhetoric that obscures these processes with allusions to freedom and efficiency. Policy decisions are increasingly determined by market processes (as opposed to democratic or other political processes). The resulting circumstances are extraordinarily difficult to navigate for constituencies that experience increasing austerity, precarity, and insecurity –and news dominated by market interests.
Neoliberal theory (emphasizing competition and individualism) is an antithesis of ecological theory (emphasizing cooperation, solidarity, and commonality) described in this paper. Depoliticized design cultures typically reproduce the assumptions of the most economically powerful actors in society (who have the money to employ designers). Neoliberal ideology has stunted sustainability agendas in design as prominent design theorists and design journals have circulated ideas that dismiss ecologically progressive ideas. Design theory in leading journals and books has explicitly scorned emergent ideas in sustainability discourses with outright hostility (and vicious ad hominem attacks) on occasion. These attitudes have helped maintain the status and are responsible for the slow progress of sustainable design theory and practice.
Designers (like everyone else) are constrained by the incentives, priorities, and dynamics in the economic and political context in which we work –which is currently governed by neoliberalism and extreme forms of capitalism. Transition Design is based on a very different worldview and ideology. Thus, Transition Design is engaged with alternative economics theory and movements as an:

> Emerging body of thought that views the dominant economic paradigm and the consumer-based marketplace (capitalism) as one of the root causes of the complex problems of the late twentieth and twenty-first centuries. The authors identify the inherent, unsustainable problems in this paradigm and offer myriad alternatives and solutions. (Irwin, 2015, p. 241)

This engagement with ideas on the structures that determine the priorities embedded in the economic system (and therefore in the design industry) is key to "transforming the system that determines what is designed" (Boehnert, 2014, p. 120). Disengagement from political circumstances is not an option for those who understand the risks associated with continued unsustainable development and are committed to making transitions to more sustainable futures possible.

Ecological Literacy in Transition Design

Transition Design has greater potential to address sustainability agenda than previous formulations of sustainable design due to the integration of ecological literacy into its worldview (Irwin, Tonkinwise, Kossoff, & Scupelli, 2015, p. 4). It is a theory of design with "heightened awareness of a myriad of wicked problems confronting us in the twenty-first century and an increasing acknowledgment that they are interconnected and interdependent" (Irwin, 2015, p. 230). Transition Design harnesses ideas and discoveries from a diversity of fields such as physics, biology, mathematics, philosophy, sociology, and organizational development (Irwin, 2015, pp. 234, 242) to catalyze sociotechnological change. Ecological literacy provides the insights necessary to design within complex systems as the foundation for Transition Design.

David Orr stressed the importance of design in making sustainable futures. He claimed that environmental problems "are mostly the result of a miscalculation between human intention and ecological results, which is to say that they are a kind of design failure . . . [which signal] inherent problems in our perceptual and mental abilities" (2002, p. 14). Yet these design failures also suggest that improvements can be made through design. Recently, Orr wrote an introductory chapter in the 2018 *Routledge Handbook of Sustainable Design*: "The Political Economy of Design in a Hotter Time." Here, Orr (2018) published a list of criteria or basic rules of ecological design that draw on comprehensive engagements with the socioecological challenges:

1. Maximum uses of solar energy
2. Protect diversity of all kinds
3. Eliminate waste
4. Use nature as a model
5. Make it affordable
6. Design for repair and disassembly
7. Build in redundancy and resilience
8. Maximum public participation
9. Beauty. (p. 6)

Ecological literacy offers approaches to help designers to create communication, artifacts, spaces, and services supporting sustainable transitions. However, Orr stressed that the problems of our era also require political and economic shifts to direct the system in which designers operate. In this new work, Orr (2018) moved more explicitly into the political domain:

> However ecologically improved one building, neighborhood, city or enterprise may be, the entire system is still trending towards disaster. The problem is not in the particular techniques of design, which have become very sophisticated, but in the haphazard structures –economic, political, social– in which design occurs, which slows the efforts to take ecological design to the necessary scale. The rules of the larger system permit change only at the margins, which is to

> say only slight adjustments…To really improve the human prospects the precepts of ecological design must inform our politics, governance, law, and economics, not just buildings, technologies, manufacturing and landscapes. (p. 8)

Ultimately, legislators, officials, economists, political theorists, and all who work to develop social, economic, and political policy must "design social systems that work with, not against, natural processes" (Orr, 2018, p. 8). This critically and politically engaged ecological literacy recognizes that the political economy determines which problems are addressed by design –and which problems are ignored.

Integrating ecological principles into design theory while simultaneously challenging the system structures that enable ecological harms is a substantial task for Transition Design. Ecologically engaged Transition Design can respond to longstanding problems where sustainability agendas fail to adequately attend to the continuation of humankind and nature in all its diversity on the face of this planet. Informed by ecological thought, Transition Design is systems aware, enabling, participatory, collaborative, and aligned with the patterns and processes of nature. It enables responsible-ability in design. With this ecologically engaged approach, Transition Design can become a basis for understanding and responding to the complexity of contemporary problems.

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Resumen: Múltiples hallazgos en diversas ciencias han demostrado la complejidad de las relaciones humano-naturaleza, y han expuesto las limitaciones de las tradiciones filosóficas que minimizan, descartan o incluso niegan la importancia de los procesos que sostienen la vida y que permiten la existencia humana. Este artículo revisa el pensamiento ecológico histórico y contemporáneo como una base para el Diseño para la Transición. El diseño ecológicamente comprometido presenta desafíos profundos para una variedad de suposiciones incrustadas en las culturas del diseño. En este documento se exploran las tensiones asociadas junto con algunas de las formas en que el Diseño para la Transición, ecológicamente alfabetizado, puede conducir a la creación de futuros sostenibles.

Palabras clave: Pensamiento ecológico - complejidad - ecología - error epistemológico - alfabetización ecológica - modernidad - sostenibilidad - Antropoceno - Capitaloceno - Ecoceno.

Resumo: Muitas descobertas em diversas ciências demostraram a complexidade das relações do ser humano com a natureza e expuseram as limitações das tradições filosóficas que minimizam, descartam ou inclusive negam a importância dos processos que sustentam a vida e que permitem a existência humana. Este artigo revisa o pensamento ecológico histórico e contemporâneo como base para o Design para a Transição, ecologicamente alfabetizado, pode conduzir à criação de futuros sustentáveis.

Palavras chave: pensamento ecológico - complexidade - ecologia - erro epistemológico - alfabetização ecológica - modernidade - sustentabilidade - Antropoceno - Capitaloceno - Ecoceno.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

The Emerging Transition Design Approach

Terry Irwin *

Abstract: This paper outlines an emerging Transition Design approach for addressing "wicked" problems (such as climate change, loss of biodiversity, crime, poverty, pollution, etc.) and catalyzing societal transitions toward more sustainable and desirable futures. Wicked problems are "systems problems" that require a new problem-solving approach. The Transition Design framework brings together an evolving body of practices that can be used to (a) visualize and "map" complex problems and their interconnections and interdependencies; (b) situate them within large, spatio-temporal contexts; (c) identify and bridge stakeholder conflicts and leverage alignments; (d) facilitate stakeholders in the co-creation of visions of desirable futures; and (e) identify leverage points for change (locations in which to situate design interventions) within the wicked problem and the socio-technical-ecological systems that form its context.

Key words: Transition Design - sustainable design - wicked problems - stakeholder relations - socio-technical transitions - future visions - backcasting - social design - design studies.

[Abstracts in spanish and portuguese at page 181]

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The Need for a New Design-Led Approach

A new, design-led approach is needed to address the complex, wicked problems confronting societies in the 21st century (Hughes & Steffen, 2013; Jensen, 2017) and to seed and catalyze societal transitions toward more sustainable and desirable long-term futures (Porritt, 2013). Problems such as climate change, water security, poverty, crime, and loss of biodiversity are challenging in part due to the high degree of social complexity by which they are characterized. These problems involve multiple stakeholders with conflicting agendas

(Dentoni & Bitzer, 2015), straddle disciplinary boundaries, and will require sustained behavioral changes and multiple interventions over short, middle, and long horizons of time in order to be resolved (Australian Public Services Commission 2007; Klein, 1993). Traditional design approaches, characterized by linear processes and de-contextualized problem frames, the objective of which is the swift realization of predictable and profitable solutions, are inadequate for addressing this class of problem (Irwin 2011b; Norman & Stappers, 2016; Sanders & Stappers, 2008). Complex, wicked problems are "systems" problems, meaning they are ill defined, exist at multiple scales, and are interconnected and interdependent (Buchanan, 1995; Coyne, 2005; Rittel & Webber, 1973) and that any intervention (attempted solution) in one part of the system has ramifications elsewhere in unpredictable ways. Wicked problems are continually evolving and cannot be solved by a single solution from a single expert, discipline, or profession. Most significantly, these types of problems took a long time to become "wicked" and will therefore take a long time to resolve.

A more holistic approach is needed to address problems that will take a dozen years or even decades to resolve. This approach must enable practitioners and researchers to distinguish between the consequences and root causes of wicked problems (what we often experience as a problem in our everyday life is really a *consequence* or *symptom* of a wicked problem at a higher level of scale). The root causes of wicked problems often involve the social dynamics that permeate them, so a new problem-solving approach must also identify and address stakeholder concerns and conflictual relations. Stakeholder assumptions, expectations, beliefs, and cultural norms *must* be factored into problem frames and inform solutions. More importantly, collective stakeholder intelligence (Forrester, Swartling, & Lonsdale, 2008; Global Partnership for the Prevention of Armed Conflict, 2009, p. 4) must be leveraged in the design of interventions (solutions). Finally, a new approach must frame wicked problems within the extremely large socio-technical systems within which they evolved (Norman & Stappers, 2016, p. 90). Traditional design approaches decontextualize problems in order to simplify them, focusing on their present-day ramifications; therefore, these approaches can fail to identify and understand the historical origins (roots) of the problem. This approach can result in what we refer to as "pseudo solutions" –solutions that address *symptoms* instead of root causes– and can therefore unintentionally cause, or exacerbate, problems elsewhere in the system. Left unidentified, these pseudo solutions can, themselves, evolve into wicked problems.

An example of a pseudo solution is the widely implemented practice used by most municipal water authorities to manage storm water runoff to prevent flooding. For decades, municipalities have built infrastructure that drains storm water runoff (from rain and snow) into streams and rivers –essentially treating the water as waste and removing it from its ecosystem of origin. This pseudo solution is rarely questioned, and therefore its connection to problems such as drought, flooding, and climate change goes unobserved and unchallenged. Kravcik and Lambert (2015, 2016; Kravcik et al., 2016) have discussed the unintended consequences of this practice, which include severe soil dehydration, erosion, loss of vegetation, loss of soil nutrients, depletion of ground water reserves, disruption of local weather patterns, decrease in precipitation and –ultimately– rising sea levels (p. 2). Because the socio-technical and natural ecosystems that form the larger problem

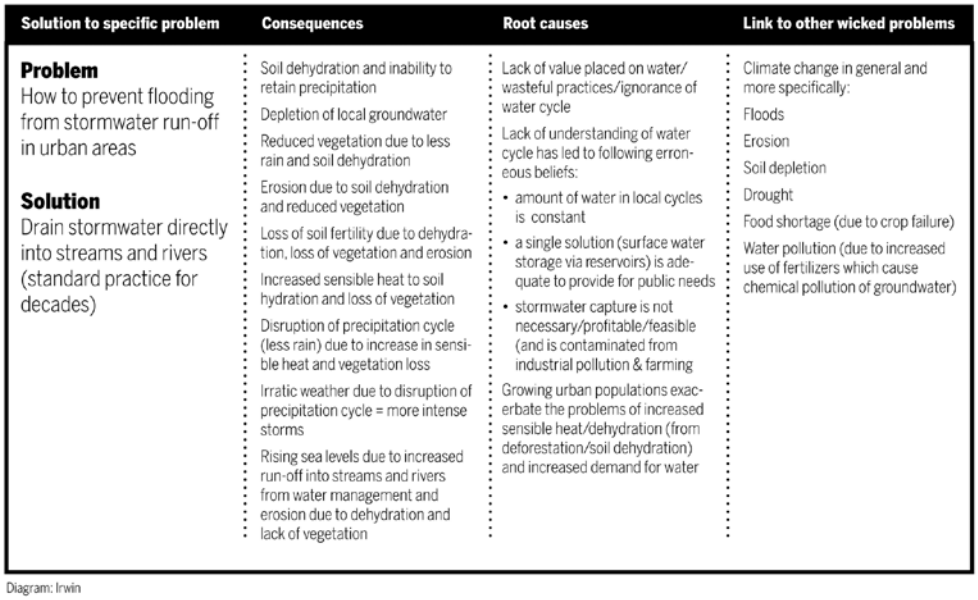


Figure 1. HOW SOLUTIONS CAN UNINTENTIONALLY EXACERBATE WICKED PROBLEMS**.** Solutions such as storm water management can often have unintended consequences and actually exacerbate the problem they are intended to solve. The figure illustrates the consequences of the solution as well as the root causes that underpin both problem and solution.

context are not taken into consideration, the connection between storm water management and the problems outlined above continues to be overlooked, negatively impacting both climate and ecosystem health (See Figure 1). Solutions like this one, conceived within small contexts that fail to integrate social *and* environmental concerns into the problem frame, are common. As a result, many purported "solutions" are either the root cause of, or contribute to, countless wicked problems. Therefore, a new approach must be rooted in a deep understanding of systems principles, such as feedback loops, self-organization, and properties of emergence (Capra, 1996; Capra & Luisi, 2014, pp. 442-252; Irwin, 2011b, pp. 240-246), which explain the dynamics within both ecological *and* social systems.

It is crucial to identify and involve affected stakeholders in wicked problem resolution (Carlsson-Kanyama, Dreborg, Moll, & Padovan, 2008). User- and human-centered design approaches seldom have the objective of identifying *all* affected stakeholders and their concerns, nor do they examine the individual and collective beliefs, assumptions, and cultural norms that have contributed to the problem. For example, traditional design approaches might identify the ways in which an urban water shortage might affect certain

user groups, but often the concerns of certain groups are privileged over others (privilege is usually connected to commissioning the research, political capital/power, or holding disciplinary expertise associated with the problem). Traditional research approaches are unlikely to identify the root cause of an urban water shortage as "the lack of value its citizens place upon water" and, yet, core beliefs like this one give rise to practices and behaviors that contribute to the problem.

At a macro systems level, a society's failure to value water might manifest through collective practices such as dumping industrial waste into rivers and streams, or the rampant use of pesticides and fertilizers that pollute local water supplies. On a micro systems level, everyday practices such as over-watering lawns, owning swimming pools, over-washing clothes, and frequent bathing all contribute to urban water shortages.

The Importance of Involving Stakeholders in Problem Resolution and System Transition

Transition Design draws on approaches from the social sciences to understand the social roots of wicked problems and places stakeholder concerns and collaboration at the heart of the problem-solving process. We use the term "stakeholder" to refer to anyone who has a stake or interest in a specific issue or is affected by a particular problem. The importance of engaging stakeholders in the problem-solving process is well known, particularly in the areas of policy and governance, environmental issues, backcasting, and conflict resolution (Bohling, 2011; Carlsson-Kanyama et al., 2008; Global Partnership for the Prevention of Armed Conflict, 2015; Grimble & Wellard, 1997; Quist & Vergragt, 2006; Simon & Rychard, 2005). As yet, however, stakeholder involvement and analysis has not been integrated into traditional design processes. The Australian Public Service noted that "a key conclusion of much of the literature about wicked policy problems is that effectively engaging the full range of stakeholders in the search for solutions is crucial" (2007, p. 27). There are many well-established methods for engaging stakeholders in relation to complex problem solving, for example: participatory action research (PAR) (Chatterton, Fuller and Routledge, 2007; Cornwall & Jewkes 1995), multi-stakeholder governance (Helmerich & Malets, 2011), multi-stakeholder processes (MSPs) (Global Partnership for the Prevention of Armed Conflict, 2015), and stakeholder analysis (SA) (Grimble & Wellard, 1997).

Stakeholder analysis is described by Grimble and Wellard as a holistic process that can enable a better understanding of a system and the impact of change by identifying and engaging key actors or stakeholders (p. 175). Transition Design argues that stakeholder relations can be seen as the "connective tissue" within a wicked problem, and failure to address these concerns and understand their complex relations are barriers to problem resolution. Conversely, because stakeholder relations permeate the problem (system), they also have the potential to be leveraged in designing interventions aimed at its resolution (Reed et al., 2009). Cornwall and Jewkes (1995) have noted that PAR focuses upon "knowledge for action" (p. 1667), while Chatterton, Fuller, and Routledge (2007) argue that the overriding motivation of participatory research is "aimed at social transformation rather than to use a set of tools aimed at the 'production of knowledge' and the 'solving' of 'local' problems"

(p. 218). The Global Partnership for the Prevention of Armed Conflict has listed several benefits that result from successful multi-stakeholder engagement (2015): The involvement of more actors provides a broader range of expertise and perspectives, meaning that problems can be **better analyzed**, based upon several different viewpoints. Such analyses can lead to a more **comprehensive strategy** to address complex conflict situations. MSPs provide the opportunity for greater understanding of different stakeholders' capacities, roles, and limitations, thus contributing to **better coordination** of interventions. MSPs can help organizations **pool and share resources**, including skills, funding, staff time, and logistical or administrative resources. The involvement of multiple stakeholders can be conducive to public outreach and awareness-raising at different levels simultaneously, increasing the reach from grassroots to policy mobilization. In this way, they are a potential **multiplier effect** when the key messages of the process are communicated to the participants of the respective constituencies. MSP can contribute to building *trust* among diverse stakeholders, and enable relationships that can outlast the process itself. They can provide a platform for much needed **capacity building** among practitioners at different levels. Sharing skills and knowledge can enable participants to see problems in new ways, which is also conducive to **innovation**.
In addition to PAR, other methods, including stakeholder participant workshops, qualitative research, group discussions, storytelling and futuring/foresighting (which are not addressed in this paper), can be used to reveal insights about stakeholder groups.

The Emerging Transition Design Approach

A Transition Design approach for addressing wicked problems and catalyzing systems-level change is emerging. We call it an "approach" rather than a "process" because designing interventions aimed at transitioning entire systems will require a variety of tools and methodologies, used in different ways –no single, prescribed process will be effective in all circumstances. This section reports on workshops conducted with the city of Ojai, California, to frame their water shortage as a Transition Design problem. These workshops have in part been informed by courses in the topic taught at Carnegie Mellon's School of Design and in Majorca, Spain in 2017. The approach proposes two key components: a framework that provides logic for bringing together practices outside the design disciplines and a three-phased approach for applying them. It should be stressed that this approach is still in nascent form and is offered here as an invitation to other researchers and practitioners to provide feedback, critique, and engagement in order to evolve a design-led approach for systems-level change.

The Transition Design Framework

The framework (See Figure 2) provides a logic for bringing together a variety of practices (knowledge and skillsets outside the design disciplines), situated within four mutually influencing, co-evolving areas relevant to seeding and catalyzing systems-level change: vision (because we need to have clear visions of what we want to transition to), theories of change

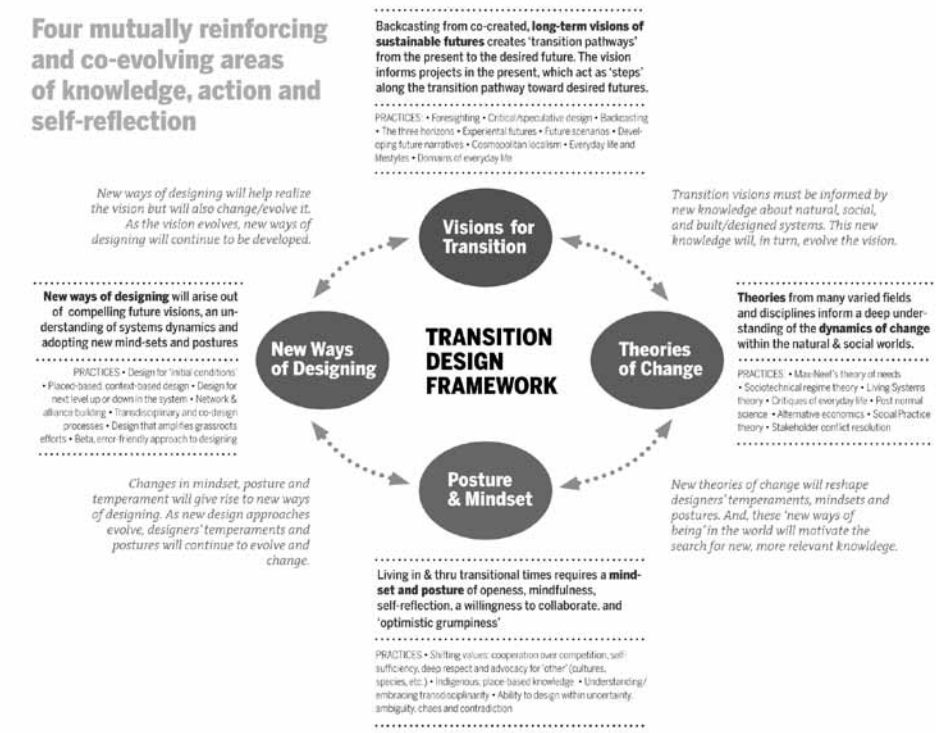


Figure 2. THE TRANSITION DESIGN FRAMEWORK. The Transition Design framework provides a logic for bringing together knowledge and skillsets relevant to designing for transitions.

(because we need a variety of theories and methodologies about how to seed and catalyze change within complex systems), mindset and posture (because we will need to develop postures of open collaboration and self-reflection in order to undertake this work), and new ways of designing, (which will arise out of the previous three areas). Each of these four areas contain a variety of practices that can evolve and change and which together form a "palette" from which practitioners can configure and customize problem-solving approaches.

Transition Design Phases

Practices (See Figure 3) from the framework can be used in a "loosely" phased approach aimed at understanding stakeholder concerns and designing interventions aimed at transitioning the "system." These phases, reframing the present and future, designing interventions, and waiting and observing, are outlined below.

Phase I - Reframing: Present and future. In this phase, stakeholders undertake a multi-step process to reframe the problem in the present *and* future. Reframing the problem in the present enables stakeholders to arrive at a shared understanding that is essential in coordinating short- and long-term actions. Reframing the future connected to the problem enables stakeholders to co-create visions of a desired future (in which the problem has been resolved) and develop "transition pathways" for getting there (Quist & Vergragt, 2006, p. 1028). Whether it is acknowledged or not, each stakeholder affected by a wicked problem has an implicit or explicit vision of a future associated with it (Rawolle, Schultheiss, Strasser, & Kehr, 2016). We argue that, in the face of the problems confronting 21st century societies, our images/visions of the future are often dystopian, or at best, an extrapolation of the current situation –a future in which the problem has not been fully resolved. Nanus (1992) contends that positive future visions are powerful motivators: "a vision –the mental image of a desirable future– can help to bring about this future by mobilizing people into action geared toward attaining it," while Polak (one of the early futurists) maintained that "the rise and fall of images of the future precedes or accompanies the rise and fall of cultures" (1973, p. 19). The co-creation of visions of desirable futures helps stakeholders transcend their conflicts and oppositions in the present by creating a future space in which they all agree. Future visions can inform interventions and projects in the present that act as steps along a transition pathway toward desired futures (See Figure 4).

Phase one is referred to as a process of "reframing" both problem and context in large, spatio-temporal contexts. The concept of framing was first introduced by Bateson (1972) and subsequently adopted in disciplines such as psychology, linguistics, and sociology. Lakoff describes frames as "the mental structures that shape the way we see the world" (2004, p. xi–xii). These structures or cognitive models are influenced by metaphors, norms, mass media, political movements, and personal history. Rittel and Webber (1973) maintained that wicked problems are intractable, in part due to the multiple stakeholders who are affected by them and who have opposing points of view and conflicting agendas. One of the reasons stakeholders remain in opposition to one another is because they each bring with them their own limited understanding of the problem (the problem frame), as well as fears, expectations, and beliefs about the problem itself, all of which are influenced by individual and collective "frames".

The reframing phase of the Transition Design process challenges existing problem definitions and expected outcomes and seeks to foster consensus and empathy among stakeholders. It acknowledges existing stakeholder frames and facilitates a reframing process aimed at achieving a shared understanding of the problem by identifying the narratives, metaphors, and conflictual expectations and belief systems that underlie it. Recently, an approach to reframing has been trialed both in classroom projects and in two workshops held with the community of Ojai, California. However further experimentation is warranted, and critique, feedback, and exploration by other researchers is encouraged.

- *Mapping the problem.* Problem mapping is a process in which stakeholders collaborate to develop a visual representation of a wicked problem, then identify as many relationships (interdependencies and interconnections) within it as possible. Types of relationships include oppositions and affinities between stakeholders, connections and interde-

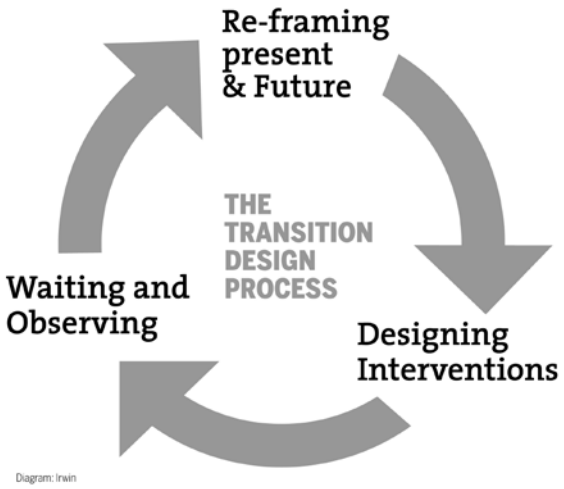
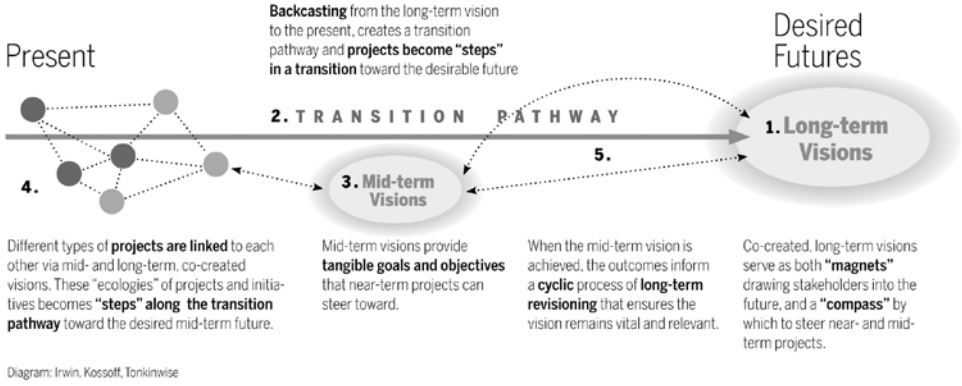


Figure 3. (Left) THE THREE PHASES OF THE TRANSITION DESIGN APPROACH. The emerging Transition Design approach proposes three phases of reframing, designing, and observing. This is an iterative process that will likely extend over years or even decades in order to resolve a wicked problem and/or shift a socio-technical system. **Figure 4.** (Down) LINKING PROJECTS AND INITIATIVES TO MID- AND LONG-TERM FUTURE VISIONS. Backcasting from mid- and long-term future visions creates a "transition pathway" along which linked projects and initiatives serve as steps toward the desired future. This figure shows how the Transition Design principles of futuring, backcasting, and linking/amplifying can be used together to seed and catalyze systems-level change.



pendencies between areas of the problem that could be causal or connected via feedback loops, etc. The problem mapping process is intended to: (a) enable stakeholders to arrive at a shared understanding of the problem; (b) develop an appreciation of the limited perspective and specialized knowledge held by each stakeholder group; (c) enable stakeholders to adopt new collaborative postures in order to transcend differences (the process introduces an element of "play" and co-discovery intended to build trust and empathy); (d) provide stakeholders with an understanding of and appreciation for the complexity

of the problem; (e) position stakeholder participants as advocates of the collaborative process within the wider community and represent other stakeholder viewpoints within their group; and (f) create a visual artifact (problem map) that can be continually updated and validated through qualitative research and informal feedback and that can serve as a rallying point for community action and awareness.

The importance of achieving a shared understanding of the problem among stakeholders cannot be stressed enough. The Australian Public Service Commission in a 2007 report argued that a lack of shared understanding can result in the belief held by certain stakeholder groups that their view of the problem is correct and that they alone should be able to specify and control a course of action aimed at its resolution. The report goes on to say that:

> It can be extremely difficult to make any headway on an acceptable solution to the wicked problem if stakeholders cannot agree on what the problem is. Achieving a shared understanding of the dimensions of the problem and different perspectives among external stakeholders who can contribute to a full understanding and comprehensive response to the issue is crucial. (p. 27)

The report argues that arriving at a 100 percent agreement is neither necessary nor feasible. Rather, it is important to achieve a general, shared understanding of the problem and appreciation for the diversity of stakeholder perspectives and positions. This, in turn, becomes the foundation for a productive dialogue based upon empathy and trust.

When stakeholders undertake a collaborative problem-mapping process, they are more likely to transcend the frames they bring with them and collectively arrive at a new problem definition (reframing). Problem definition is a complementary approach in which Bardwell (1991) argues that people access information and solve problems based upon the mental models or cognitive maps that they have assembled over the course of their lives. In the problem definition and resolution process, people draw on these models subconsciously, even when they encounter new situations. This means that new problems are framed exactly like the old ones and therefore, more effective potential solutions are overlooked (pp. 604-605). "Problem definition ramifies throughout the problem-solving process, reflecting values and assumptions, determining strategies, and profoundly impacting upon the quality of solutions" (p. 605). Essentially, how the problem is framed is how it will be understood and acted upon. Because most people have not tried to confront or solve a wicked problem before, it is imperative that old frames and cognitive models are set aside in order to reframe the problem using group intelligence.

Transition Design argues that wicked problems require new cognitive models and inclusive problem-solving approaches. Although traditional design approaches may employ a range of user- and human-centered research techniques, they rarely bring multiple stakeholder groups together *with the objective of co-creating a new problem definition and identifying stakeholder concerns, beliefs, and assumptions.*

This type of collaboration "potentially avoids the cost of resolving adversarial conflicts among stakeholders in the long term" (Bramwell & Sharman, 1991, p. 392). However, because the distribution of power among stakeholders is almost always unequal (Baur, Elteren, Nierse, & Abma, 2010, p. 233), if one or two groups are in the position to frame

(define) the problem, their needs and concerns will be privileged over those of others. Disregarding certain stakeholder groups and proposing solutions that overlook or even undermine their needs is a common obstacle in resolving wicked problems. The Transition Design approach favors a consensus-based, multi-stakeholder approach that can aid in transcending oppositions, conflict, and the limitations of old cognitive maps and frames and can equalize power relations.

Visually mapping a wicked problem via stakeholder collaboration will challenge designers to develop new tools and visualization methods. There are numerous digital mind-mapping and wicked problem visualization tools available; however most have been conceived within a reductionist paradigm that focuses on the object or "node" and minimizes the importance of the connections or the "webs of relationships and interactions" within a problem. Transition Design argues that the social relationships within wicked problems are often discounted or overlooked altogether. New digital toolsets must be developed that can accurately represent the nuances of stakeholder relations and their connections at multiple levels of scale within a wicked problem. It is equally important to develop new analog tools that facilitate collaborative stakeholder problem mapping in a workshop setting.

Although there are limitations inherent within the workshop format, it can still serve as a valuable way to foster understanding and empathy among stakeholder groups. The Ojai workshops (Irwin, 2017) used a simple approach that provided stakeholder groups with a large wall canvas with predetermined categories onto which they were asked to map the wicked problem of the Ojai water shortage. The categories included (a) social issues, (b) environmental issues, (c) infrastructure issues, (d) political issues, and (e) economic issues. Participants used Post-it notes to identify as many facets of the problem as possible within each category. Once the map was populated, stakeholders took time to study it and discuss the results. Participants were surprised to discover facets of the problem of which they had been unaware and encounter opposing viewpoints on aspects of the problem that they had taken for granted as "true". For instance, water experts focused on the infrastructure area of the map and identified multiple problems resulting from an antiquated municipal water infrastructure, something that most residents are unfamiliar with. Residents, in contrast, were able to discuss everyday hardships and inequities caused by the water shortage, as well as the ways in which daily practices (such as overwatering lawns and landscaping choices) or the growth of short-term rental properties (such as Air BnB) exacerbated it.

Once participants familiarized themselves with the entire problem map, they were asked to draw connections among its various elements. There are many different types of relationships that can be mapped within a wicked problem such as the Ojai water shortage: **interdependencies** (between the social issue of residents' lack of awareness/ignorance of the water shortage and the political issue of a lack of support for developing new policies, such as taxation or restricting water use); **causal relationships** (the economic issue of businesses promoting tourism and development is causally related to the environmental issue of the depletion of local water reserves and the environmental issue of declining ecosystem health due to the increased demand for water); **conflictual relationships** (the economic issue of increased tourism is at odds with the social issue of residents facing a water shortage while tourists in the hotels are not compelled to conserve); **affinities** (between

the political issue of the need to pass new laws limiting water use and alignment with the environmental issue of conservationists' desire to protect the integrity of local water sources); and relationships that **feedback** on each other (the economic issue of marketing to increase tourism increases the popularity of Ojai as a destination, which results in more people, using more water, which exacerbates the water shortage –a positive feedback loop). These relationships comprise *the dynamics within wicked problems* that usually go unaddressed by traditional design approaches.

Bringing stakeholder groups together in a workshop format to reframe/redefine a wicked problem can transform a potentially conflictual or confrontational discussion into a process of discovery and co-creation, as evidenced in the Ojai workshops. Within the brief workshop format, there was not time to develop a complete, accurate problem map, but it has the potential to become a strategic artifact and rallying point when validated through additional stakeholder input and qualitative research aimed at capturing all stakeholder perspectives.

- *Mapping stakeholder concerns and relations.* In this step, *all* stakeholder groups are identified and their feelings, concerns, and beliefs about the problem itself are revealed in a process that brings together aspects of both actor mapping and stakeholder analysis (FSG, 2017; Reed et al., 2009). Stakeholder feelings are frequently overlooked, but they often lie at the root of wicked problems, and, as yet, there is no design-led process aimed at identifying and integrating these feelings into the problem frame.

There are many well documented approaches used to identify and resolve stakeholder relations, including needs-fears mapping (Wageningen University, 2017), conflict analysis tools (Mason and Rychard, 2005), and multi-stakeholder processes (Hemmati, 2002), to name a few. These approaches delve more deeply into understanding stakeholder differences, mindsets, and relations than do traditional design approaches (such as actor and stakeholder maps, which often privilege the consultant's, expert designer's, or client's point of view), and offer collaborative processes for resolving conflicts and facilitating more meaningful collaboration and understanding. What is lacking, however, is a design-led component that can lead to tangible action in the form of designed interactions, communications, and artifacts that motivate, educate, and facilitate new behaviors and outcomes. Transition Design proposes that many stakeholder conflict resolution methods from the social sciences can inform a new, design-led approach that mediates stakeholder relations as a strategy in addressing wicked problems.

Identifying stakeholder fears/concerns and hopes/desires is essential to understanding a wicked problem and developing effective interventions aimed at its resolution. Transition Design differs from other design-led approaches in its emphasis on understanding the assumptions, beliefs, and cultural norms related to the problem *for each stakeholder group*. We argue that understanding stakeholders' deepest feelings about the problem and the way in which their individual and collective belief systems (worldviews) (Clarke, 2002; Kearney, 1984; Kuhn, 1962; Lent, 2017; Woodhouse, 1996) affect their view the problem is fundamental to resolving differences and/or transcending them through the co-creation of visions of desirable futures.

Figure 5.

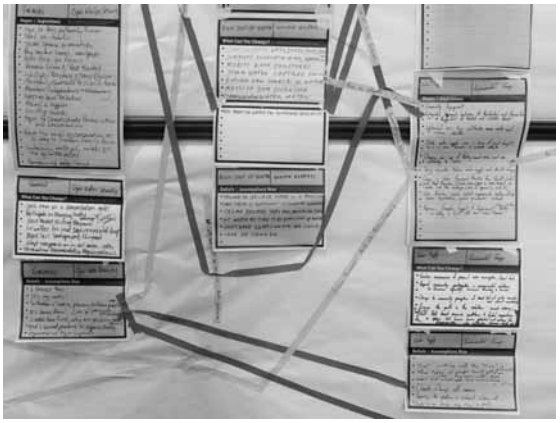


Figure 6.

Figure 5. WORKSHOP PARTICIPANTS MAPPING STAKEHOLDER CONCERNS & RELATIONS. Participants at a Transition Design workshop held in Ojai, California, May 2017, take part in an exercise to map stakeholder concerns and areas of conflict and alignment. **Figure 6.** MAPPING STAKEHOLDER RELATIONS. Workshop participants mapped areas of alignment (light colored tape) and conflict (dark colored tape) between their fears/concerns and hopes/desires.

In the Ojai workshop, stakeholder groups were asked to list their fears and concerns related to the regional water shortage and, in a second step, their hopes and desires connected to its resolution. The results were hung on a long wall and groups were then asked to find points of opposition or alignment among the lists. Each stakeholder group was given a roll of green and a roll of red tape and asked to connect points of opposition (red) and points of affinity and alignment (green) (See Figures 5 and 6), to which they added notes explaining the nature of the connection. This informal and rather "boisterous" process interjected an element of discovery, surprise, and "play" into what would ordinarily have been a tense and potentially confrontational debate among diverse stakeholder groups about how to solve the problem. Within this context, stark oppositions (instances in which one stakeholder group's greatest fear is another's fondest wish) could be identified in a spirit of discovery and friendly competition to see how many connections could be found. Dialog between opposing groups was collegial, even lighthearted. In general, stakeholders were surprised at the number of lines of affinity among groups, and it became a point of positive speculation and discussion. A final discussion around the large, sprawling map and web of concerns, fears, hopes, and desires centered on how red lines of opposition could be resolved and green lines of affinity leveraged, essentially shifting the focus from differences to the objective of transcending them.

The visual artifact (problem map) served to acquaint stakeholders with the diversity of viewpoints connected to the wicked problem and challenged the commonly held belief that a single solution, developed by a single stakeholder group with relevant domain ex-

pertise (and therefore, ownership), could solve the problem. This stage of the process revealed unexpected areas of agreement, alignment, and complementarity that sparked dialog among stakeholders with generally opposing agendas, and the results have the potential to lead to consensus and collaboration in areas of common interests and objectives. In a final, self-reflective exercise, stakeholder groups examined the cultural norms, beliefs, and assumptions that contributed to or were the root cause of the water shortage. This is challenging work, because few of us are skilled in examining our own worldviews and mind-sets as the roots of a wicked problem. Once stakeholder groups identified their cultural norms, beliefs, and assumptions that contributed to the problem, they were asked the question "If by 2050, the problem has been resolved, how would cultural norms, beliefs, and assumptions have changed?" At the conclusion of the exercise, each stakeholder group had two sets of beliefs, assumptions, and norms: one set for the present day (that they felt had contributed to the problem) and a second "future" set (that they believed would be the basis for the long-term resolution of the problem). As an example, one group articulated their present-day beliefs about the water shortage as "We believe that water is something to be bought and sold because there will always be enough of it." This contrasted with their set of 2050 beliefs: "Water is precious and sacred, it is part of 'the commons,' and everyone has a right to enough." This exercise, while challenging, marked a distinct change in tone in the workshop. Participants appeared to slow down and became more speculative, even contemplative. Encouraging participants to adopt this new posture was essential to the following step.

- *Future visioning.* The Transition Design process aspires to draw on a range of foresighting techniques that will enable stakeholders to co-create compelling visions of long-term, lifestyle-based futures in which the problem has been resolved and most stakeholder needs have been met. These visions can act both as a magnet that pulls communities toward a desired future and as a compass to guide their actions in the present (projects and initiatives).

The intersection of foresight studies and design has given rise to several new areas of research and practice such as "design fiction," "speculative/critical design," and "experiential futures" that are concerned with envisioning and prototyping possible or even preferable futures. Transition Design argues that these approaches can contribute to positive shifts in the mindsets, behaviors, and practices that have contributed to wicked problems. Dunne and Raby (2013) note that a "futures" approach "thrives on imagination and aims to create spaces for discussion and debate about alternative ways of being, and to inspire and encourage people's imaginations to flow freely. Design speculations can act as a catalyst for collectively redefining our relationship to reality" (p. 2). Candy and Dunagan (2017) note that "experiential futures" are able to catalyze "high quality engagement, insight, and action to shape change, using whatever means fits the situation" (p. 3), and seek to provide individuals and groups with glimpses of a future that resonates more deeply than other modalities. Transition Design argues that until people are able to clearly envision (and become enthusiastic about) a future in which the problem has been resolved and their needs met, they will remain resistant to change and pessimistic –or even apathetic– about the likelihood of resolution.

New tools and approaches for enabling stakeholders to co-create compelling visions of long-term futures are needed. Stakeholder groups in the Ojai workshop undertook a visioning exercise called "Snapshots from 2050" in which they co-created a future, lifestyle-based narrative in which the water shortage had been resolved. Groups were provided with relevant examples of "day in the life" narratives to ensure they remained focused on *the holistic process of envisioning/reconceiving entire lifestyles* rather than the dominant, reductionist approach of *envisioning discipline-based solutions*. Groups were provided with narrative word/image templates and charged with portraying a glimpse of what everyday life in 2050 would be like *for their stakeholder group if the problem were resolved*. Question prompts included: "What would the resolution of the problem make possible for your stakeholder group?" "What might you be able to do/accomplish that you currently cannot?" "In what ways would your everyday life (practices, surroundings, profession, home life) look different or be better if the water shortage were resolved?"
Groups used their previously articulated 2050 beliefs, assumptions, and cultural norms as the springboard for the futuring exercise. They were asked to consider how their 2050 worldview might inform new practices, behaviors, and designed interactions and how artifacts would be part of their narrative. Participants also referenced their earlier lists of fears/concerns and hopes/desires and speculated about how they would have been resolved or fulfilled in the future; they then used them to develop more concrete examples for the day-in-the-life narratives. Each stakeholder group hung their future narratives on a wall and presented to the entire group. In a final step, groups reprised the exercise of drawing green lines of affinity and red lines of opposition between the different narratives. The results showed many green lines due to the striking similarities among the visions and few red lines of opposition. Our hypothesis (which can only be borne out through additional extensive research with more groups) is that the "space" participants enter into when envisioning a desired, common future enables them to transcend opposition and conflict in the present and focus on affinities and similarities in a commonly envisioned, hypothetical future. Exploration should be done on whether qualitative research could inform this and other visioning processes.

- *Backcasting*. Backcasting is a term introduced by Robinson (1982) that is often used as an approach to address long-term, complex societal issues that involve multiple stakeholder groups (Carlesson-Kanyama et al., 2008; Quist & Vergragt, 2006). Backcasting begins with defining a desirable future then backcasting to the present to create a transition pathway along which projects, initiatives, and programs are positioned as initial steps in that transition. Backcasting differs from forecasting in approach. Forecasting extrapolates current trends (based in dominant paradigms out of which the problem arose) into the future, whereas backcasting attempts to define interesting futures, analyze their consequences, and determine the conditions necessary for these futures to materialize. Robinson (1982) notes:

> The major distinguishing characteristic of backcasting analysis is a concern, not with what futures are likely to happen, but with how desirable futures can be attained. It is thus normative, involving working backwards from a particu-

> lar desirable future end-point to the present, in order to determine the physical feasibility of that future and what policy measures would be required to reach that point. (p. 337)

Transition Design proposes backcasting as a collaborative activity in which stakeholder groups can leverage their visions of desirable futures to inform tangible, consensus-based action in the present.

Due to time limitations, Ojai workshop participants did not delve deeply into this process. Groups were asked to create a transition pathway from the present to their 2050 vision and use Post-it notes to speculate on what projects, initiatives, and milestones would be necessary (between the present and 2050) to achieve the vision. This technique draws on the approaches used by Porritt (2013), Dreborg (1996), and Sharpe (2013) in using backcasting to envision a process of societal transition. Workshop organizers observed that participants were highly challenged when asked to think in long horizons of time and struggled with the exercise. Further research must be undertaken to evolve the backcasting process for Transition Design, and it is likely that a variety of approaches can be employed and combined in different ways. Irwin, Tonkinwise, and Kossoff (2015) have proposed an iterative and cyclical process for backcasting and visioning (See Figure 4) as the slow process of problem resolution and societal transitions unfold. This process ensures that long-term thinking becomes common and that future visions do not become fixed and static, but rather, are in a continual process of evolution and change, based upon feedback and outputs from present and near-term projects (steps in the transition).

Once a transition pathway has been mapped and concepts for projects and initiatives that can serve as steps toward the desired future are explored, the second phase of the Transition Design process begins.

Phase II - Designing interventions. In phase 1, stakeholders develop a shared understanding of the problem and a vision of a desired future. Phase 2 situates both the wicked problem *and* the vision within a large, multi-level, spatio-temporal context. It also draws on tools and approaches from outside the design disciplines to aid in understanding extremely large problem frames and in developing interventions for the problem's resolution.

Most design-led approaches situate problems within small, easy to manage contexts and problem frames whose objective is the realization of swift, profitable solutions. We argue that wicked problem resolution requires myriad interventions at multiple levels within extremely large spatio-temporal contexts. Wicked problems exist at multiple levels of scale and *always* have their roots in the past because it takes years, decades, or even longer for problems to become wicked. It is necessary to look at both higher *and* lower systems levels to understand the problem's ramifications and consequences in the present, as well as looking to the past to understand the problem's root causes and evolution.

In essence, phase two of the Transition Design process involves looking up and down systems levels in space and backward and forward in time in order to contextualize and address the wicked problem framed in phase I –both dimensions play a role in devising interventions (See Figures 7 and 8). Delineating and investigating large systems contexts is what distinguishes the Transition Design process and makes it possible to (a) under-

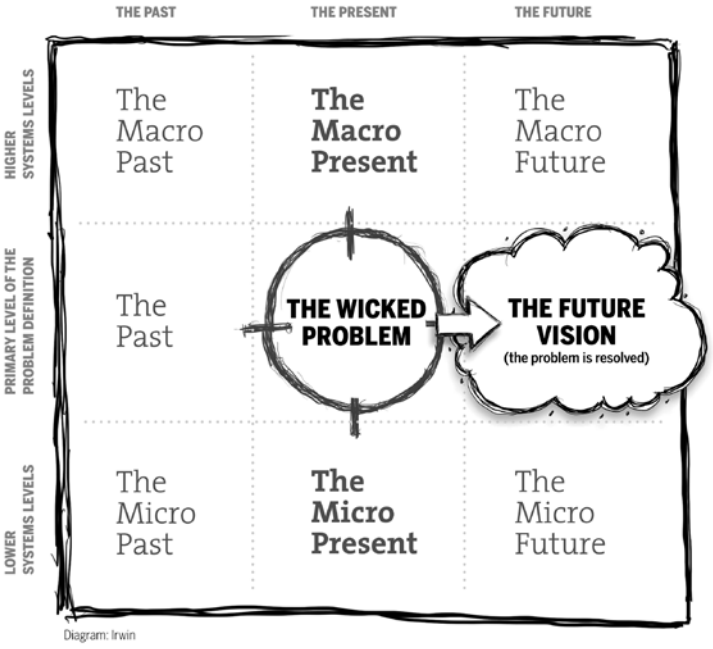


Figure 7. FRAMING WICKED PROBLEMS WITHIN LARGE SPATIO-TEMPORAL CONTEXTS. Setting a large spatio-temporal context for a wicked problem involves looking up/down systems levels in the present and back and forth in time (past and future) in order to understand the consequences and root causes of the problem and develop a compelling future vision that will inform the design of present-day interventions.

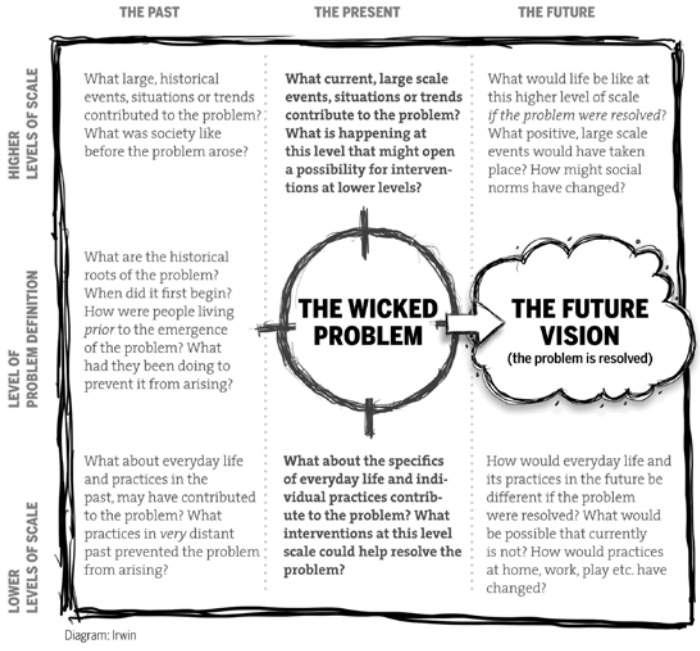


Figure 8. EXPLORING THE SPATIO-TEMPORAL CONTEXT FOR A WICKED PROBLEM. The example shows a series of questions aimed at exploring the large spatio-temporal context within which the problem is framed.

stand the **present**-day ramifications and consequences of wicked problems (looking up and down systems levels); (b) understand how wicked problems evolved and identify their root causes (in the **past**); and (c) intentionally transition the system toward preferred **futures** over multiple time horizons.
Due to the limited format of this paper, only a few of the strategies we have found useful for surveying the spatio-temporal context of a wicked problem and developing more appropriate criteria for interventions are presented below.

- *Multi-level perspective.* The MLP framework (See Figure 9) is a conceptual framework used to investigate how large socio-technical systems (the interactions between people and complex societal infrastructure) transition over long periods of time. The term socio-technical system was first used by Trist, Bamforth, and Emery at the Tavistock Institute (Trist & Murray, 1993) and was later developed by researchers and scholars in northern Europe as sustainability transitions and socio-technical transition management. The MLP framework describes three distinct systems levels in which events unfold, infrastructure and artifacts arise, and webs of interaction occur: the macro (the landscape), the meso (the regime), and the micro (the niche) (Geels, 2006). Kossoff, Tonkinwise, and Irwin (2015) describe these interactions as "social, technical, institutional, infrastructural and normative" and argue that the networks of relationship between these levels and their various actors/factors become progressively more "entrenched" and resistant to change as their scale increases, eventually becoming "locked in" to a particular trajectory (pp. 5-6).
Rotmans and Kemp (2003) describe the actors and events at each of the three levels. At the *macro-level* the societal landscape is determined by changes in: the macro economy, political culture, demography, natural environment, and worldviews and paradigms. This level responds to relatively slow trends and developments. Its seismic undercurrents can play an important role in speeding up or slowing down a transition, but its geology is for the most part unyielding. At the *meso-level* operate the social norms, interests, rules, and belief systems that underlie strategies of companies, organizations, and institutions and policies of political institutions. At this level the dynamics is determined by dominant practices, rules, and shared assumptions that are most geared towards optimizing rather than transforming systems. At *the micro-level (niche-level)* act individual actors, technologies, and local practices. At this level, variations to and deviations from the status quo can occur as a result of new ideas and new initiatives, such as new techniques, alternative technologies, and social practices.
Situating a wicked problem within an MLP context is useful for several reasons: (a) it aids in understanding the historical evolution of the problem, which is essential in identifying and addressing root causes (which always exist at multiple levels of scale); (b) it is useful in identifying both intractable, entrenched areas within the system *and* opportunities for disruption (often incubated at the niche level, but large events at the landscape level can open up opportunities at lower levels); and (c) it provides a large enough context to reveal connections and interdependencies among other wicked problems that can inform strategies for more powerful interventions aimed at exponential change (i.e., killing two birds with one stone).

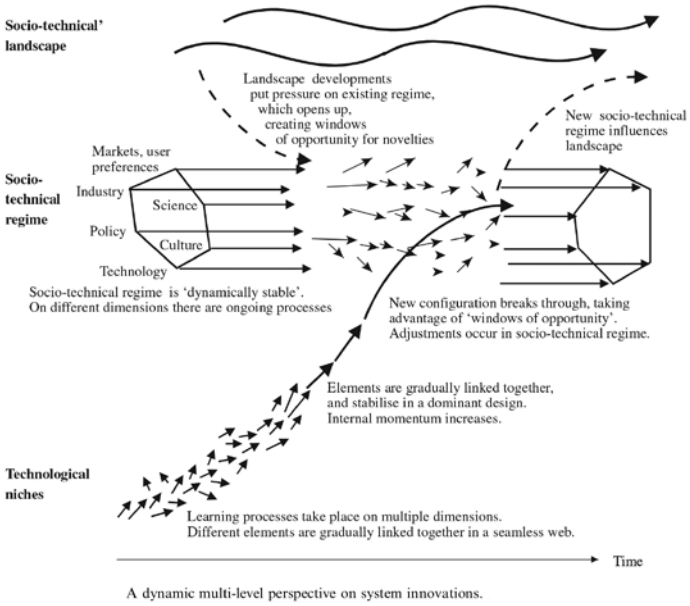


Figure 9. THE MULTI-LEVEL PERSPECTIVE (MLP). The multi-level perspective (MLP) on systems innovation. From Geels (2006). Reproduced with permission from *Technology in Society Journal 28*, 448.

"Reading" the social-technical terrain with the MLP can reveal what Meadows (1999) has called "places to intervene in a system." Although the MLP has drawbacks (Kossoff et al., 2015), it is nevertheless a useful way of understanding the connections and dynamics among multiple wicked problems within a large spatio-temporal context, which is a crucial precursor for designing interventions at multiple levels of scale. For more on socio-technical transitions and the MLP see Grin, Rotmans, and Schot (2010), and Gaziulusoy and Brezet (2015).

- *The domains of everyday life and lifestyles.* Everyday life and lifestyles are often overlooked as legitimate spheres in which to consider and address problems (Debord, 2002; de Certeau, 1984; Lefebvre, 1991), and is the primary conceptual space within which Transition Design interventions should be conceived and implemented. Everyday life can be seen as an emergent property of people striving to satisfy their needs. The SPREAD reports (2012a, 2012b, 2012c) establish lifestyles as the area in which "our sense of self, our world views and our values" (2012a, p. 17) come together and reflect how we live, spend our time, and interact with others. The reports have identified "lifestyle change" as a key strategy for addressing wicked problems in multiple sectors and the basis for conceiving more holistic and appropriate present-day interventions and future visions.
The Domains of Everyday Life is a conceptual framework developed by Kossoff (2011) to describe everyday life in terms of the nested and interdependent social forms that exist

at multiple systems levels that are characteristic *of healthy societies*. Kossoff argues that because problems are *always* experienced within the context of our individual and collective everyday lives, this is the natural context within which to address their resolution. The approach aims to create a framework for envisioning a sustainable future, provide a model for transdisciplinary collaboration and logical integration among projects, and embody "a more qualitative and humane understanding of sustainability than recent technocratic and economistic appropriations of this concept have come to do" (Kossoff, 2011, pp. 123-124). The domains of everyday life framework is similar to the MLP in its examination of systems levels that extend from the micro through the macro, but it differs in its emphasis on sustainable lifestyles and the quality of everyday life.

Kossoff proposes five domains of everyday life: the household, the neighborhood or village, the city, the region, and the planet, as "semi-autonomous and mutually interdependent wholes" (2011, p. 133). The vitality and health of these domains is directly related to individuals' and communities' ability to control the "satisfaction of their needs" (Max-Neef, 1992) at each specific level of scale. The SPREAD Sustainable Lifestyles 2050 report (2012a) defines lifestyle as "the way we live our lives that allows us to fulfill our needs and aspirations" (p. 9) and argues that unsustainable lifestyles are related to myriad wicked problems. The SPREAD research was undertaken primarily to inform policy changes that support sustainable shifts in lifestyles in four key areas: "consuming (food, household and leisure consumer products), living (the built environment and homes), moving (individual mobility and transport), and health and society (health, well-being, ageing, and equity)" (p. 11). The report lays out several approaches that have the potential to inform Transition Design solutions at multiple levels of scale.

Identifying lifestyles and everyday life as leverage points for change is central to the Transition Design process. Modern day fragmentation of knowledge into disciplines and specialties has become an entrenched barrier to the kind of transdisciplinary collaboration that is crucial to addressing wicked problems (Australian Public Service Commission, 2007; Block, 2008). Individuals from specific disciplines, working independently or only in collaboration with closely related fields, are unable to formulate solutions that fully address wicked problems and meet all stakeholder needs. Two important areas overlooked by most expert-driven approaches are belief systems and everyday practices, both of which contribute to wicked problems. Shifting the focus from disciplinary, "siloed" solutions, to re-conceptualizing everyday life and lifestyles, establishes belief systems, cultural norms, behavior, and practices as leverage points for change and creates an integrative space in which experts and laypeople alike can meet on equal footing to design and implement more holistic and appropriate interventions.

- *Manfred Max-Neef's theory of needs and satisfiers.* Both the domains of everyday life and SPREAD approaches emphasize the importance of needs satisfaction. Transition Design draws on economist Max-Neef's theory of needs (1991), which differs from other theories in its decoupling of needs and satisfiers and in its argument that needs encompass both the material *and* non-material and are non-hierarchical, finite, and universal (all people everywhere have the same, limited, set of needs). Conversely, it argues that the *ways* in which people satisfy their needs are limitless and unique to their era, culture, belief sys-

tem, age, and geographic location (See Figures 10 and 11). Kossoff emphasizes the connections between needs satisfaction, diversity, and place, arguing that "how needs are satisfied … gives rise to the diversity of forms of everyday life that have arisen all over the planet, and that make everyday life *specific to place*" (2011, p. 130). Transition Design expands on Max-Neef's theory in its contention that needs can be satisfied in either sustainable or unsustainable ways (Irwin, 2011a). Establishing needs satisfaction as a criterion in the re-conception of everyday life and lifestyles is an important strategy for challenging the dominant socio-economic and political paradigms within which most wicked problems have evolved and can lead to the design of more powerful interventions.

In modern societies, basic needs may go unrecognized and/or unmet because we confuse needs, which are finite and universal, with wants and desires, which are limitless (Irwin, 2011a). Unmet genuine needs lie at the root of many complex problems. For example, Max-Neef, (1991) attributes issues such as bigotry, elitism, authoritarianism, etc., to the unmet need for understanding. This is because the actions, behaviors, and artifacts used to satisfy a particular need can, unintentionally, prevent, subvert, or inhibit its satisfaction. Conversely, "synergistic satisfiers" (Max-Neef, 1991, p. 36), which satisfy several needs simultaneously, can become a key strategy for evaluating and critiquing existing situations and designing interventions aimed at resolving wicked problems. We refer to these as "synergistic solutions" or "synergistic interventions".

Max-Neef's theory can be used as a Transition Design approach in two ways: to critique lifestyles and everyday life at multiple levels of scale to ascertain whether genuine needs are being met or undermined, and as a new criterion for framing problems and designing interventions (solutions). For example, a proposed or existing solution could be evaluated upon the basis of whether it is "synergistic" (satisfying several needs simultaneously) or destroying/ inhibiting (often solutions satisfy wants/desires and overlook or undermine genuine needs).

- *Social practice theory and design for behavior change.* Both social practice theory and design for behavior are micro-level approaches that can be used in understanding how people's practices and behaviors contribute to wicked problems and how they can become strategies for designing interventions aimed at their resolution.

Whereas the MLP framework takes a macro view and focuses on niche incubation (developing protected, experimental solutions at lower systems levels) against the backdrop of large, moving events within the socio-technical landscape, social practice theory examines:

> The multiplicity of 'little pictures,' taking the 'practices' of people in their everyday lives 'as the unit or focus of attention' (Shove and Walker, 2010, p. 471). It is through such practices, day after day –bathing, eating, driving, dressing, shopping and so forth– that people sustain themselves, but also contribute toward environmental degradation. (Kossoff et al., 2015, p. 7)

Social practice emerged out of theories proposed by sociologists and philosophers (Bourdieu, 1997; Giddens, 1984; Schatzki, 2010); however the work of Shove, Pantzar, and Watson (2012) is most relevant to the emerging Transition Design process. Social

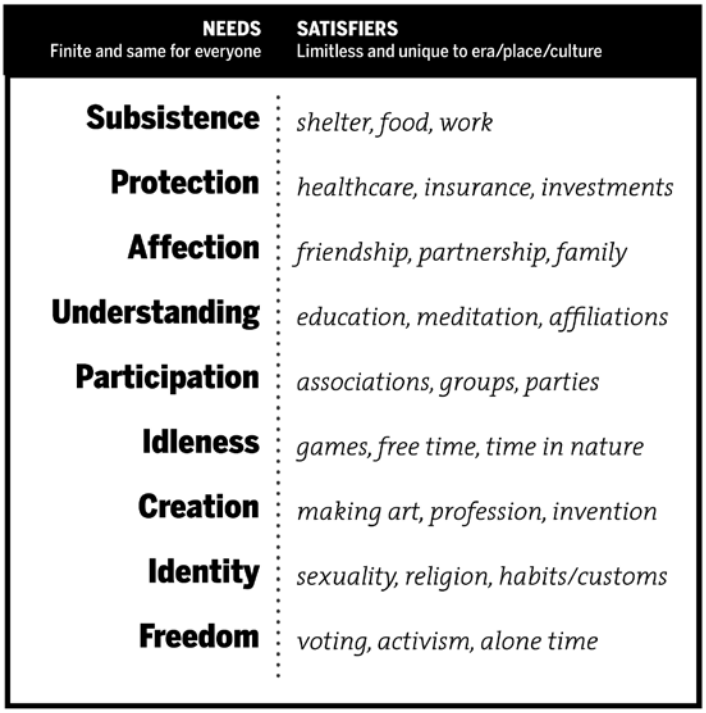


Figure 10. MAX-NEEF'S LIST OF NEEDS AND SATISFIERS. Manfred Max-Neef's list of finite human needs and ways in which those needs might be satisfied. Needs are finite and universal, while satisfiers are limitless and specific to geographic location, culture, era, etc. Based on Max-Neef (1991).

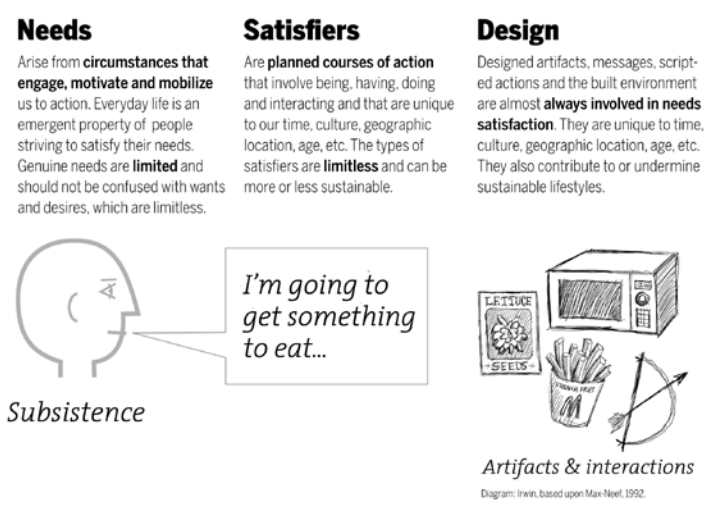


Figure 11. THE RELATIONSHIP BETWEEN NEEDS, SATISFIERS AND DESIGN. Needs motivate us to take planned courses of action to satisfy those needs. Satisfaction of needs often involves designed artifacts, communications, environments, and interactions, which are always specific to geographic location, era, culture, etc. Based on Max-Neef (1991).

practices are the micro-components of everyday life and lifestyles and their importance is often overlooked by traditional user- or human-centered approaches that tend to "focus on single product-user interactions and specific moments in time" (Kuijer & de Jong, 2011, p. 1) within extremely limited, for-profit contexts. By contrast, social practice theory examines how "constellations" of practices (interactions) can contribute to the emergence and intransigence of wicked problems. The importance of the role of practices in wicked problems has led to a proposal for "practice-based design" as an approach for addressing the social and systemic aspects of the wicked problem of overconsumption (Scott, Bakker, & Quist, 2011, pp. 279-280).

Social practice theory further differs from user- and human-centered design approaches in its examination of the entire ecology of elements involved in practices, including knowledge, meaning, understandings, skills, and artifacts (Kossoff et al., 2015). Shove and colleagues propose a conceptual triad comprised of "materials" (things, technologies, tangible physical entities, materials), "competencies" (skills, know-how, and technique), and "meanings" (symbolic ideas and aspirations) to explain the complexity of how practices arise and become intractable (Shove et al., 2012, p. 14). Conversely, if any one of the elements shift (by accident or design), the entire practice shifts accordingly and therefore can potentially disrupt an entire ecology or system of practices. Transition Design suggests that intentionally disrupting or shifting these practices can be an important leverage point for change within larger socio-technical systems (Scott et al. 2011).

"Design for behavior change aims to influence user behavior, through design, for social or environmental benefit" (Lockton, Harrison, Cain, Stanton, & Jennings, 2013, p. 37). Also known as behavioral design, and design for sustainable behavior, the approach draws from social and cognitive psychology, health psychology, behavioral economics, decision science, human factors, and other fields to focus on people's attitudes, behaviors, motivations, and understanding. It also explores the ways in which designed artifacts and interactions affect people's behavior and decisions. A chief aim is to leverage psychological principles to design products and services that can influence users' behavior for social benefit (Lockton et al., 2013, p. 37). As an example, the Centers for Disease Control and Prevention reported a 50% drop in respiratory infections in children, due in part to a campaign to educate for behavior change –motivating children to wash their hands (Jana, 2010).

Understanding how individuals' beliefs, attitudes, behaviors and practices contribute to wicked problems is fundamental to addressing them, and both social practice theory and design for behavior change can serve as important supplements to traditional human- and user-centered design approaches.

- *The Winterhouse social pathways matrix.* The Winterhouse social pathways matrix is the only approach presented here whose origins lie in traditional design practice; however, it can be used as a framework for mapping the range of expertise and scale of engagement involved in addressing wicked problems. In 2013, the Symposium for Education and Social Change hosted by the Winterhouse Institute (2017), developed a model for mapping change ambitions for social innovation design (See Figure 12). The framework can be used in several ways: (a) to envision, map, and link projects, interventions, and experiments at multiple levels of scale for greater impact; (b) to guide research, design,

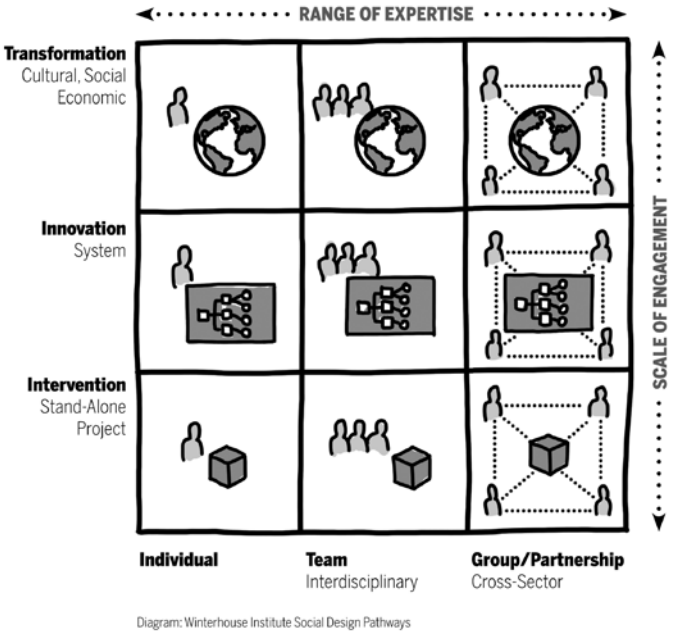


Figure 12. WINTERHOUSE SOCIAL DESIGN PATHWAYS. The Winterhouse social design pathways framework describes the territories and scales at which designers work.

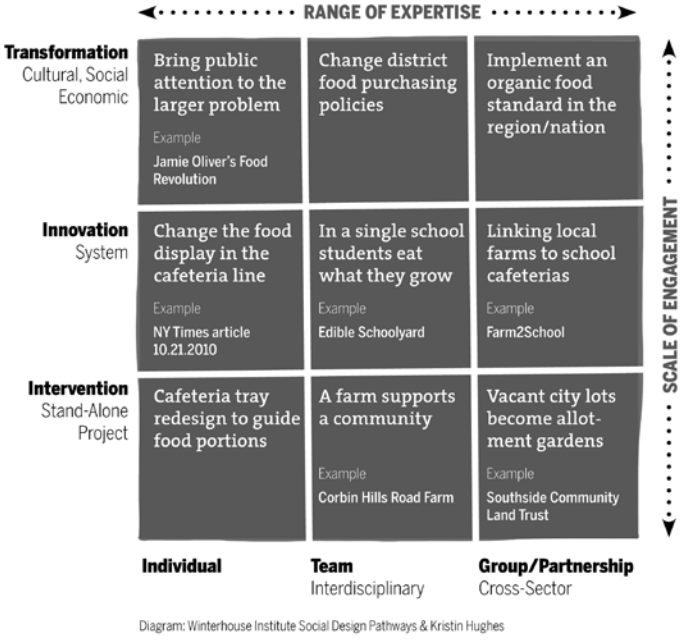


Figure 13. ADDRESSING THE WICKED PROBLEM OF CHILDHOOD OBESITY. The wicked problem of childhood obesity is addressed within the social pathways matrix. The example shows how designed solutions within each of the nine areas might manifest. In order to resolve a wicked problem such as this, multiple interventions at multiple levels of scale over multiple time scales would be required.

and development; (c) as an index for specific skills, resources, and partners necessary for a successful project/solution; and (d) to assess project outcomes and impacts.
The model has also been useful in illustrating the evolution of design (with its origins in the lower left quadrant, evolving toward the upper right) and mapping the broad/expanding territories in which designers are now working (Amatullo, 2016; Irwin et al., 2015). The matrix also encourages designers to take a systems view of designing interventions. Figure 13 shows how a complex problem such as childhood obesity can be addressed using the model. When existing projects and initiatives are mapped onto the matrix, new ideas and themes for connecting projects may emerge. A simple solution such as the redesign of a cafeteria tray that guides the portions of food is situated in the lower left, where a single expert designer can contribute a relatively simple solution from within the discipline of product design. Solutions situated in the upper right-hand side of the matrix involve transdisciplinary teams and are more systemic in their approach, leading to more significant degrees of change. These solutions often involve the redesign of regional or even national policies and infrastructure and designers contribute as members of transdisciplinary teams and are *not* the sole expert, but rather act as catalysts/facilitators, directing the application of design-led research approaches. To significantly address the problem of childhood obesity, solutions in *all* areas of the matrix, implemented over long periods of time, would be required. This illustrates how even simple solutions (like a cafeteria tray) can contribute to systems-level change when they are tied to a larger vision and systems strategy. In this way, the matrix can be used as a visioning device to aid teams in planning small interventions that are steps in a mid- and long-term, multi-phased process for change. In such cases, the matrix serves as a road-map for change at multiple levels of scale, over longer horizons of time.

- *Amplifying and linking projects.* Two key strategies for designing interventions involve "linking" and "amplifying" projects and initiatives (See Figure 4). Linking new and existing projects and initiatives together (through the co-creation of, short-, mid-, and long-term visions) creates synergistic relationships among them and provides greater leverage for achieving short- and long-term goals. Collectively, these "ecologies" of linked projects serve as both systems interventions *and* steps along transition pathways toward co-envisioned futures. It is also a strategy for conserving resources and building a wider base of support, and has the potential to ignite exponential change by linking ecologies of interventions in one wicked problem sector to those in other sectors. For instance, strategies and visions aimed at addressing the wicked problem of a city's lack of affordable housing could simultaneously help resolve the problems of gentrification and speculative overdevelopment. Or linking projects aimed at resolving gentrification with those addressing a lack of access to education or crime could share resources and achieve greater impact. In this way, linking can be both a spatial and temporal system strategy.
Transition Design's strategy to link "ecologies" of interventions in order to seed systems-level change complements and builds upon other design approaches (Irwin et al., 2015). For example, projects that originate as one-off service design or social innovation solutions, when linked, have the potential to become Transition Design solutions –steps in longer transitions.

The second strategy –amplifying– supports Manzini's argument (2015, pp. 123–124) that "amplifying grassroots efforts" is an approach to addressing local problems. However, amplifying calls for a decidedly different mindset –that of the non-expert, who approaches a new situation in a posture of empathy and *sensitivity to emergent solutions*. This is akin to philosopher Ernst Bloch's notion of latent possibilities or the "not yet" (1995). Sociologist de Sousa Santos describes the not yet as "on the one hand, capacity (potency) and on the other, possibility (potentiality) … [to] identify and enlarge … signals, clues or traces of future possibilities in whatever exists" (de Sousa Santos, 2006, p. 32). This contrasts with the dominant, expert designer mindset and posture that approaches each new situation with the intent to "fix what is wrong" through superior specialist knowledge and experience. Amplifying looks for "what is right" with indigenous, local efforts already underway that can be amplified to become systems interventions.
The Amplifying Creative Communities Project (Penin, 2010, p. 446) was launched with the objectives to:

> *Find* often-hidden examples of people who have organized their own resources for more sustainable city living, *learn* to create successful alternatives to the standard commercial and government services, *help* those initiatives become easier and more enjoyable through service design and *show* others how they could create similar alternatives themselves. (Amplifying Creative Communities, 2010)

In cases like this, the Transition Designer assumes several non-expert roles: an *amplifier* of grassroots efforts, a *connector* between previously unrelated projects (via his/her systems-level view and approach), and a *facilitator* among stakeholder groups to align goals and develop future visions.

- *Bringing the approaches together.* The approaches presented here (and many more) can aid in designing effective interventions within large spatio-temporal contexts. This is one of the key characteristics of the Transition Design process, making it possible, as described earlier, to (a) understand the present-day ramifications and consequences of wicked problems (looking up and down systems levels); (b) understand how wicked problems evolved and identify their root causes (in the past); and (c) intentionally transition the system toward preferred futures over multiple time horizons.

Phase III - Waiting and Observing. In order to seed and catalyze change in complex systems and resolve wicked problems, multiple interventions, at multiple levels of scale, over multiple time horizons will be required. Working *with* and *within* large, slow-moving systems will involve periods of activity and intervention counterbalanced by intervals of observation and reflection in *order to understand how the system has responded to the perturbation*. This contrasts with traditional, design-led approaches, which are characterized by fast-paced, linear processes whose objective is clear, predictable, conclusive (and often profitable) results (solutions).

Complex systems with large social components (many people interacting with each other) display properties of self-organization, including "the spontaneous emergence of new structures and new forms of behavior" (Capra, 1996, p. 85). Because these systems are self-organizing, the ways in which they react to perturbations from their environment (for instance, how a wicked problem would respond to a series of designed interventions) are internal and self-determined; that is, their response cannot be predicted. This is an extremely important principle that, if properly understood, should radically transform traditional design processes (and would go a long way toward mitigating many of the wicked problems exacerbated by design and designers). Simply put, it is impossible to predict the outcomes of the solutions we design. The context for these interventions –the system itself– will rarely respond to an intervention the way we think it will, and the more complex the system, the more unpredictable its response. This principle of self-organization is why so many meticulously designed solutions fail. Instead of thinking in terms of "designing solutions," Transition Designers must think in terms of "solutioning" at multiple levels of scale, over long periods of time. Or, as Wheatley and Kellner-Rogers have said, we must learn to "tinker" things into existence (1996, p. 10).

This extremely important part of the Transition Design approach will be highly controversial because it challenges the dominant socio-technical, economic, and political paradigms out of which most wicked problems have arisen. These paradigms are based upon a style of thinking that has been widely critiqued and described in turn as "mechanistic", "reductionist", and "de-contextualized" (Irwin 2011b). Sociologist George Ritzer argues that this style of thinking dominates 21st century society via business models characterized by efficiency, calculability, predictability, and control (Ritzer, 2004, pp. 12-15). Transition Design argues that these same characteristics are found in traditional problem-solving process and are –ironically– one of the root causes of wicked problems (Irwin, 2011b).

Designing for systems-level change will require fundamentally different mindsets and postures (Irwin, 2015) and will be slow, patient work with "emergent outcomes". It will also challenge dominant paradigms that demand fast, concrete, predictable, and profitable results. Orr (2002) makes an important distinction between fast and slow knowledge, arguing that:

> The twentieth century is the age of fast knowledge driven by rapid technological change and the rise of the global economy. This has undermined communities, cultures, and religions that once slowed the rate of change and filtered the appropriate knowledge from the cacophony of new information. (p. 36)

The aim of slow knowledge is resilience, harmony and the preservation of patterns that connect (Orr, 2002) and will challenge Transition Designers to adopt a slower pace and the ability to think in longer horizons of time. Stewart Brand of the Long Now Foundation asks, "How do we make long-term thinking automatic and common instead of difficult and rare?" (Brand, 1999, p. 2). Similarly, the "seventh generation" principle from the Great Law of Iroquois Confederacy required its citizens to make crucial decisions with the welfare and preservation of the seventh future generation in mind (Loew, 2014). This type of

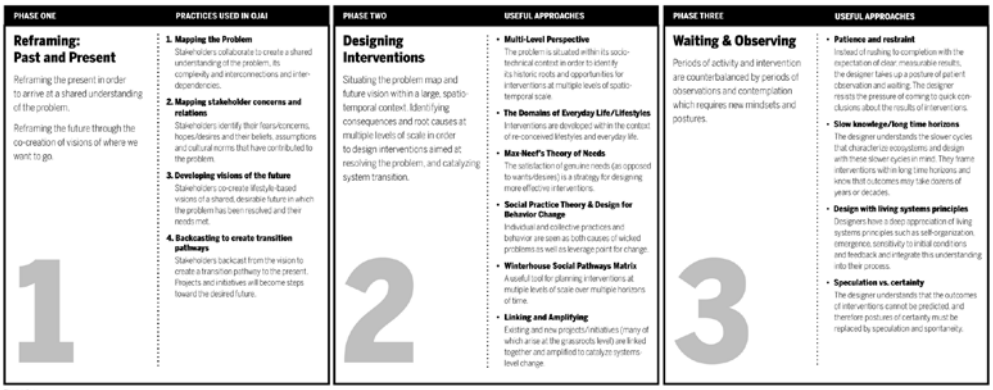


Figure 14. OVERVIEW OF THE EMERGING TRANSITION DESIGN APPROACH. Overview of the emerging Transition Design Approach.

long-term thinking, along with an understanding of the longer, slower cycles that govern the natural world, *must* underpin Transition Design.

The Transition Design approach could be compared with Chinese acupuncture. An acupuncturist will closely observe the patient for a period of time in order to understand the imbalances or blocks in the system (body) and then place needles along specific meridians in order to shift energy (this is similar to a practitioner designing systems interventions). After placing the needles, the acupuncturist will *always* wait and observe how the body (system) responds. Sometimes several weeks might go by before another treatment is recommended. The practitioner places needles based upon his/her experience and a working hypothesis that a certain response is *probable*; however, a good practitioner will wait to see how a specific individual responds (based upon their own physiology, psychology, lifestyle, etc.). Designing interventions for socio-technical systems will require a similar approach in which periods of action and intervention are punctuated by periods of observation and reflection. This process will be at odds with 21st century expectations for quick, conclusive results. Therefore, the Transition Designer will also need to develop compelling arguments and narratives about the (long-term) value and benefits of the process itself.

Conclusion

This paper has outlined an emerging, design-led approach for addressing complex, wicked problems and catalyzing societal transitions toward more sustainable futures (See Figure 14). It emphasizes the need to engage *all* stakeholders affected by the problem in order to create a shared problem definition and understanding of the oppositions and alignments among them. A framework or "guide" for situating problems within large, spatio-

temporal contexts is proposed. This framework can be used to understand root causes and consequences and identify leverage points for interventions aimed at transitioning the system along a transition pathway toward a co-envisioned future.

Transition Design aspires to become a flexible, integrated approach that makes design-led tools and approaches available to transdisciplinary teams working on transition-related projects and initiatives. Still in its nascent phase, it will require researchers and practitioners from many disciplines and a diversity of cultural perspectives working together to constitute a broadly applicable, transdisciplinary process. This paper is presented as an invitation for critique and speculation and as a roadmap for further research.

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Resumen: Este documento describe un enfoque emergente del Diseño para la Transición para abordar problemas "perversos o intrincados" *(wicked problems:* cambio climático, pérdida de biodiversidad, delincuencia, pobreza, contaminación, etc.) y catalizar transiciones sociales hacia futuros más sostenibles y deseables. Los problemas perversos son los "problemas de los sistemas" que requieren un nuevo enfoque de resolución de problemas. El marco del Diseño para la Transición, reúne un conjunto de prácticas en evolución que pueden utilizarse para (a) visualizar y "mapear" problemas complejos y sus interconexiones e interdependencias; (b) situarlos dentro de grandes contextos espacio-temporales; (c) identificar y crear puentes para los conflictos de las partes interesadas y sus líneas de apalancamiento; (d) facilitar a los interesados la creación conjunta de visiones de futuros deseables; y (e) identificar puntos de influencia para el cambio (localizaciones en donde situar las intervenciones de diseño) dentro del *wicked problem* y los sistemas socio-técnico-ecológicos que forman su contexto.

Palabras clave: Diseño para la transición - diseño sustentable - problemas perversos (*wicked problems*) - relaciones con los interesados (*stakeholders*) - transiciones socio-técnicas - visiones futuras - *backcasting* - diseño social - estudios de diseño.

Resumo: Este trabalho descreve um enfoque emergente do Design para a Transição para abordar problemas perversos ou intrincados (wicked problems: mudança climática, perda de biodiversidade, criminalidade, contaminação, etc) e catalisar transições sociais até futuros mais sustentáveis e desejáveis. Os problemas perversos são os "problemas dos sistemas" que requerem um novo enfoque de resolução de problemas. O marco do Design para a Transição reúne um conjunto de práticas de evolução que podem ser utilizadas para: a) visualizar e mapear problemas complexos e suas interconexões e interdependências; b) situar os problemas em grandes contextos espaço - temporais; c) identificar e criar pontes para os conflitos das partes interessadas;

Palavras chave: Design para a Transição - design sustentável - problemas perversos (*wicked problems*) - relações com os interessados (*stakeholders*) - transições sócio - técnicas - visões futuras - *backcasting* - design social - estudos de design.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Analysis of Ongoing Transition Projects in Barcelona. An Approach to Transition Design from a Southern Perspective

Tània Costa Gomez *

Abstract: This paper analyses a series of ongoing transition projects in the city of Barcelona and the region of Catalonia, using the Transition Design framework. The selected projects focus on rather structural elements of societal transition, such as work schedule, energy, housing, internet infrastructure and culture. The background of the study is a conference held in June 2017 under the title "Southern Perspectives on Transition Design" at EINA, the University of Design and Art of Barcelona (UAB). The study analyses each project using the Transition Case Study Template in order to generate reflections for each sector, coordinate their efforts and ascertain which southern perspectives – if any – emerge from local contexts.

Key words: Transition Design - bottom up initiatives - southern perspectives - societal transition - Barcelona - systemic creative practices.

[Abstracts in spanish and portuguese at page 197]

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This article presents research on the initiatives of several local groups within the area of Barcelona, Cataluña, Spain, groups sharing the aim of Transition Design to create new sustainable lifestyles. As will be seen, these groups also coincide in other aspects, such as methodology, content, criteria and values. These local initiatives are not design studios, even though in some cases designers do participate in their work teams. The aim of the research presented here is precisely to find confluences between Transition Design dynamics and groups of people who work on common challenges from other fields. More specifically, the study aims to enrich both spheres by relating them to each other while

also drawing the attention of Transition Design scholars to analogous initiatives that stem from citizens and social movements and networks.
In this case, local character clearly is marked by a cultural tradition that we call "southern": in this case, "southern" refers to the South of Europe, which, in many aspects, mirrors South America or Latin America. We consider this parallel to be a relevant factor and, therefore, it has been taken into account when analysing their development.
This research represents an initiative by a research group known as Design for Social Innovation & Transition Design of EINA-Universitat Autònoma de Barcelona. Funded by Spain's Ministry of Economy, Industry and Competitiveness (MINECO FFI2015-64138-P), the project, supervised by full professor Gerard Vilar, is entitled, *Generating Knowledge in Artistic Research: Towards an Alternative Account. A Meeting Point of Philosophy, Art and Design*.
These research groups have been carrying out fieldwork for the last three years via debates with design undergraduates, meetings with experts, attendance of international congresses and the composition of academic essays (Costa & Garcia i Mateu, 2015). Content production and data collection culminated in a symposium called "Southern Perspectives on Transition Design", which was held at the University of Design EINA in Barcelona on 8 and 9 June, 2017.

Southern Perspectives on Transition Design: The Symposium

The symposium intended to provide an optimum research activity where the actors involved –the objects and subjects of analysis– could meet and interact. This interaction then could serve as an agent of change in order to generate new experimentation, collaboration, communication and promotion territories.

Designing the Format

With these aims in mind, a symposium program was designed with a format specially created to generate the proposed flows of investigation. A group of third year students at EINA's Degree of Design volunteered to collaborate in its creation. The program included the following stages:

1. An inspirational lecture by Terry Irwin: This lecture took place in a cultural space in the centre of Barcelona in the form of an activity open to the general public.
2. Session at the university: This session included presentations about local initiatives as well as a debate between Terry Irwin, Guideon Kossoff and Cameron Tonkinwise from Carnegie Mellon University, Pittsburg, USA. The session concluded with a round table discussion with the participants, mainly of interest to professionals or scholars.
3. Workshop: Guests were invited from local initiatives where Transition Design analysis applied to their organisations was approached. Space was dedicated to activating the ideas and knowledge generated during the previous session debate by guest participants and professors, researchers, students and supporters.

4. Academic sessions at the university: The session presentations were framed within the following topics: a) *Southern perspectives on Transition Design*; b) *New lifestyles for transition*. c) *Design, art and (or) contemporary thought in (for) transition*. d) *Transition projects presentation*.
5. Publication: A monographic issue will be published on social innovation, sustainability and Transition Design in the research group's journal, *Design Processes. Advanced Practices in Art and Design*. The issue, expected to be released in 2018, compiles abstracts of the communications, reviews and related contributions.
6. Context: Efforts were made to hold the debate in a context relevant to participant professionals, in this case the Barcelona Design Week. It was also important to involve a representative academic program, the Doctorate Philosophy Program of Universitat Autònoma de Barcelona.

The Invited Initiatives
The local initiatives invited were selected with the aim of creating a collaboration network that would function beyond the scope of the symposium, one that could create relationships between the university environment, professional design field and related civic associations and initiatives. The selection criteria began with the selection of groups which work effectively with the idea of changing lifestyles in order to achieve a more sustainable way of life. Attention also was paid to the fact that they were collaborative, non- hierarchical, participative organisations represented by citizens or of a collective nature.
The participating initiatives included the following:

- Som Energia: A non-profit green energy consumer cooperative that produces and commercialises renewable energy in order to "promote a change from the current energy model to a 100% renewable model…managed by citizenship…To promote the growth of a more sociable and solidary economy…To part from the current energy oligopoly" (Som Energia, 2017).
- Guifi.net: A commons telecommunications network that is open, free and neutral: "Guifi·net is a bottom-up, citizenship-driven technological, social and economic project with the objective of creating a free, open and neutral telecommunications network based on a commons model…Moreover, it generates a model for collaborative economic activity based on proximity and sustainability" (Guifi, 2017).
- Sostre Cívic: A cooperative for the promotion of official handover homes: "home projects with a fairer and more accessible, non-profitable, non-speculative and transforming model and, at the same time, a more solidary way of life in tune with social economy values: equality, equity, democracy and self-management" (Sostre Civic, 2017).
- Idensitat: An artistic project:

> In continuous transformation to become a complex system, incorporating other projects, actions or interventions, promoting processes, organising exhibitions, publishing…A system based on collaborative dynamics in order to build a relationship between contemporary artistic practices and social space,

> through research, production, education in a particular context, and distribution throughout a wider context (Idensitat, 2017).

- Reforma Horaria: An independent civic initiative:

> Formed by a diverse group of people united by a common objective: to promote a positive transformation in our society through a change of schedules… A change in our use of time can promote more civic habits, strengthening equality among people, our ability to improve relations and, above all, our health and well-being (Reforma Horaria, 2017).

The Academic Sessions

The academic sessions in the communications presentation were grouped by thematic affinity and were developed simultaneously. They were designed to give importance to the final debate phase of each session, so the moderators were the coordinators of the research groups from the university. An agile formula was established for presentation dynamics, a formula that could be replicated as many times as necessary according to the flow of communications, synchronously in different classrooms; however, the sessions did not extend jointly beyond two hours in duration. Both the abstracts and the articles derived from these sessions are in the process of being published in the *Journal of Design Processes* (JDP) from the research group of the same name at the design university EINA-UAB.

With a perspective on the transition from eco-design and attention to the sustainable use of materials, presentations adhered to topics, such as exhibition design, fashion, urban furniture, architecture, alternative media to paper and ergonomics. The communications directly related to Transition Design referred to topics including pedagogy, human rights, the Palestinian conflict, synthetic biology and the hospital field. In the last group's debate, several speakers joined together in a critique of what, in their opinion, was a lack of political positioning in Transition Design's general approach.

During the dialogue, speakers noted that politics was surely one of the characteristics of the southern perspective of the Transition Design; therefore, this feature would be one of the next topics of study in the Research Group's activities. It is possible that the southern practice of Transition Design could be less agile and pragmatic than the Anglo-Saxon vision because of the political struggles in Latin societies. At this moment in Catalonia, for example, the political situation conditions all social, economic and cultural activity. This circumstance makes it almost impossible to carry out the exercise of envisioning a future scenario without a political and ideological position.

From the "southern" perspective, all social issues are also political issues. It should be noted that the context of the aforementioned debate is a university born in 1967 during the Spanish Franco dictatorship; it developed a counter-hegemonical cultural discourse that, inevitably, was also political. It also should be noted that EINA studies focus on art and design, both of which inform any emergent debates. In a sense, when the philosopher Boris Groys develops the idea of the anti-aesthetic attitude towards the product of design and art, he illustrates that the current discourse has become more complex in another

direction: "The problem is not the incapacity of the art of becoming truly political; the problem is that the contemporary political sphere is already aestheticized" (Groys, 2014).

Design Decisions Toward a "Relational Welfare"

To finish this account of the symposium, we can highlight the fact that while developing the symposium, we attempted to apply the idea of relational welfare (Cottam, 2011) to a research activity in the academy context. Consequently, hierarchies were avoided between guest participants and invited audience members. The physical space, including the furniture, was arranged especially to suit this aim. During the debates held at the university's conference hall, chairs were distributed circularly and the general public and guests were mixed with no specific order. Professors and the director of Carnegie Mellon University's Faculty of Design sat in the audience despite their positions as principal actors in the symposium. This circumstance made corporal movement necessary in order for the speakers to be seen and heard, a situation that generated dynamic spaces where speakers and participants had to move.

In terms of design, we also decided to dismiss the translation service common at this kind of event in Spain, with headphones for each member of the audience. Instead, several people able to translate to and from Catalan-Spanish-English were placed in strategic places among the audience members and next to the guests. Their task was to assist understanding in moments of special difficulty and to provide specific linguistic hints. Instead of being considered external to the session, such interactions, interruptions and discursive exchanges became part of the research development.

Though it appears trivial, the lunch setting was devised to continue the debate's dialogue –research activity via creative debate (Costa & Huertas, 2016) in a more relaxed forum. A single round table with no seat assignments was placed in the garden. Here, guests and audience members shared delicious rice cooked in the same pan. The inspiration for this setting came from an interview with Catalan artist Antoni Miralda in which he regretted the lack of communication between the artists selected to participate in a Sao Paolo biennial called, "How to Live Together". As Miralda (2006) put it, "What we don't have here is a huge table where all of us can sit at and chat, which is a pity…". For Miralda, rice is an inclusive food that dissolves power hierarchies among diners because it is a basic and elemental food for most of the world's population. This communication between diners, then, can evolve into conversation, into exchange –rewarding and without constraints– of thoughts and experiences really valued by people who talk as part of their identity.

The same philosophy of design was followed when choosing the location for the opening conference with Terry Irwin. Ultimately, the event was held at Cercle Artístic Sant Lluc, the oldest art association in the city. Most of the participating artists and local designers have been members of this association at some point. Another reason for this choice is the location's central position in the city's old quarter, in front of Market Santa Caterina, one of the busiest markets in Barcelona and an international reference point for architectonic design after its reform. Therefore, it is a space of articulation, and of local material, human and symbolic exchange transcending global extension. In terms of the character and features of the place, the conference hall used lacks the typical shape of an auditorium, but it

is the social space used by members of the artistic circle. The specific configuration of the space and the distribution of furniture promote communication between users and allows for free-flowing conversation. The nature of the space thus permits a format combining conference and conversation.

Case Study: Idensitat. Can Transition Design Encompass Systemic Artistic Projects?

This section delves into the analysis of the IDENSITAT initiative, presented in the symposium entitled, "Southern Perspectives on Transition Design" via the Transition Design Case Study of the School of Design Carnegie Mellon University [CMU], a system developed by Terry Irwin, Guideon Kossoff and Cameron Tonkinwise.
We have chosen this case study because of its singularity and the opportunities for innovation it provides to Transition Design research. The use of CMU's template on an artistic project like IDENSITAT can help to illustrate the confluences between relational-contextual artistic practices and projects on design of services, systems and interactions (Costa, 2012). In the present case, we take a step forward with the aim of defining the areas of intersection and/or non-distinction between the Transition Design perspective and another artistic approach.
As will be made clear during the analysis, correspondences between both practices reflect not only methodology but also content. In 2016, Idensitat held a conference known as "IN TRANSITION - CITY. Artistic Practices and Social Spaces" as part of the "Cohabitar entre" project. The conference included debates, lectures, work tables, case studies, an urban tour and a documentary, with the aim of analysing the idea of transition in the city and its actual transformation abilities:

> The city, the urban environment, and its most complex, most tense, most dynamic, most (re) appropriated, most collaborative, most creative, most political configuration, that is to say, 'public space', is what is brought together here as a space in transition; understanding the city as artwork, as a place for enjoyment, as an object of value, and, above all, as a collective creation, the result of decisions taken and acted upon by citizens...The transition-city creates a dialogue among scenarios which contributes to the transformation of cities based upon various perspectives and positions, examples of contemporary transition taking place in the modes of production, and examples of the active citizen participation in shaping public space and the contemporary construction of cities.

It is clear that this idea of the transition-city is not exactly the same as that of the transition-town, exemplified by the English city of Totnes and its predecessor Rob Hopkins. Both conceptions, however, can enrich each other when they enter into a dialogue and exchange values, attitudes and activities. Actually, the transition-city promoted by Idensitat is more akin to current Transition Design proposals, especially in regards to its systemic view and collective development.

Another motivation justifying our interest in this comparative analysis exercise is the investigation of possibilities for the Transition Design format to embrace artistic projects and/or to share fundamental aspects that can evolve into explicit collaboration. This issue is particularly interesting for the University of Design EINA in Barcelona (Universitat Autònoma de Barcelona) because we have fostered a collaboration on an Idensitat artistic project, between its director Ramón Parramon, a Transition Design professor at Carnegie Mellon University Cameron Tonkinwise, and two designers involved in transition processes: Mercè Rua and Adrià Garcia i Mateu. In the study, we have made use of the Transition Design Case Study template explicitly, while making changes to some titles and adjusting some content based on the purpose of this development.

Project Profile: A Systemic Approach

Idensitat is an art project that works in tandem with other art, design, architecture and anthropology projects with the aim of developing intervention initiatives in the social space. Idensitat promotes connections between groups of people, disciplines and institutions in order to investigate, experiment and influence the territory from a local basis. Idensitat's general approach considers creative processes to be agents of change for the social space while sharing approaches, methodologies and aims with participative design. Indeed, many of its participants are designers.

On a spatial basis, the starting point is always what is local (the neighbourhood), but it aims to generate and connect several territorial nodes, forming a network that can be projected into a more global context. A description of the ID Barrio Eix Besós project carried out in 2016-2017 by Idensitat provides this explanation: "It is grounded in dynamics based on artistic practices, activating processes for the collective benefit and which can have an impact on the neighbourhoods where the project is implemented, and project them later into a more global dimension" (Idensitat, 2017).

In terms of time, Idensitat produces projects to be implemented in the mid-term: from one to four years. The longest projects (c. nine years) result from adding together small projects generated from a specific location and spreading them out in bordering, nearby or, in some cases, far away spaces. Temporalities, therefore, vary according to the stage-development of each project. For its part, continuity beyond intervention depends on the action having been absorbed by the actual context; in addition, users must keep developing it autonomously, with users understood not only as local inhabitants but also as institutions and agents with the ability to transform the place.

The first stages of the design project probably are developed more thoroughly than its final stages of production and application. The following aspects are developed fully: identification of the problem, analysis of the "ecosystem", implications for the citizen groups, relationships between participant agents, ideation workshops, implementation of process development activities, collection-sampling-collectivisation of proposals and prototype start-up. The less fully developed aspects include product implementation, testing, redesigning and impact evaluation. These work stages, planned in relation to objectives, are described in project de ID Barrio Eix Besós:

> This is achieved by analysing the space in order to understand its dynamics, visualising in order to interpret the various operating conjunctions, sketching out projects in order to encourage new productive dynamics, and collaborating locally in order to enhance and multiply creative capacities.

The format of Idensitat has the potential to become a Transition Design solution, especially via a connection/integration approach. This potential results from the fact that its projects are devised as a meeting point of other projects and because relationships between entities, groups, agents and institutions are encouraged. Projects expand to multiple levels because they do not remain focused on only one area of study and/or action. Instead, they link different points of view, staging similar but not identical interests while encouraging a diversity of methodologies and collaborations between disciplines. In this case, the artistic project serves as a mediator, coordinator, facilitator and activator of intervention practices in real spaces, with the cooperation of residents.
In this sense, a clear coincidence is observed with the agglutinating function, coordinating and facilitating of the Transition Designer. In both cases, the act of projecting, typical of the traditional role of the designer, takes place in the action of "infrastructuring", a concept that Bjögvinsson, Ehn and Hillgren use in their definition of the new role of the designer. This conception is born of rethinking the participatory designer's role and pushing it further, towards the role of articulation-connection-integration:

> This infrastructure is shaped over extended timeframes, not only by professional designers, but also by users as mediators and designers…Infrastructuring entangles and intertwines activities at project time (e.g., selection, design, development, deployment, and enactment) with everyday professional activities at use time (e.g., mediation, interpretation, and articulation), as well as with further design in use (e.g., adaptation, appropriation, tailoring, re-design, and maintenance) (Bjögvinsson et al., 2012).

In every Idensitat project and in its subprojects, various organizations of a differing nature participate: the European Community Cultural Program, state and/or municipal departments of culture, district council civic centres, local associations of different kinds, educational and university environments, inter-university research groups, citizen groups, collectives of designers and artists and art institutions.
The global Idensitat project includes the following participants: Generalitat de Catalunya, Department of Culture; Barcelona City Council, Institut de Cultura; Ajuntament de Manresa; Fundación/Colección Júmex; HANGAR (Bacelona); Fabra i Coats Fàbrica de Creació de Barcelona; Xarxa Transversal; Ajuntament de Mataró; Vilanova i la Geltrú City Council; Creative Europe Programme of the European Union; and Xarxa d'Espais de Producció Xarxaprod.
The organizational chart changes its construction depending on the type of project, linking different agents, associations and institutions in each case. This process is consistent with the systemic vision of Transition Design, which also visualizes problems as part of

a network of relationships. Some of the artistic and design collectives involved in these networks include Makea, Todo por la praxis, La Fundició and Urban Recipes.

Transversal Aesthetics for a Change of Perception as a Previous Step Towards a Transition to New Sustainable Lifestyles

Idensitat clearly works with an eye on mid- and long-term sustainable futures, especially at the intersection between the social, territorial-local and urban environments. More than generating views of future sustainable lifestyles, it activates changes in the perception of current scenarios in order to facilitate the outcome of such futures. Contrasting with design forecast that anticipates a lifestyle model to be achieved, this kind of systemic artistic project paves the way for change without establishing its future form while highlighting the need to transition towards new sustainable lifestyles.

Projects are approached collectively and on a participatory basis, in collaboration with the population affected by a social, urban, demographic or identity problem. These projects seek to improve the group's quality of life via interdisciplinary creative processes as well as the creation of connections between the communities, local agents, institutions and entities involved. The issues to be dealt with stem from the confluence of different obstacles, located in multiple scales; they cannot be confronted by focusing on a single cause. Projects therefore are composed of different coordinated activities and of micro-interventions that try to embrace situational complexity.

A cosmopolitan localism (Manzini, 2006) is established, developing itself with varying intensities in different projects. Even though it is not achieved universally in the global project, it is one of the platform's aims. For example, the ID Barrio project has been developing since 2009 in specific locations in Barcelona, Mexico and Sao Paolo. The projects occur on the bordering areas between the districts of large cities and participants seek to incorporate them in a positive way into the lives of local residents. Projects and micro projects have been created specific to each city, but they share methodologies and objectives. This exchange demonstrates that the methodologies work in different contexts so long as they can be adapted to the particular identity of each new location in collaboration with the local agents involved. The methodologies of approximation for the issues worked upon in ID Barrio have been used as a starting point for work proposals of the following platforms: ID Barrio Besós (2016-2017), ID Barrio Barcelona (2009-2017), ID Barrio Mex (2013) and ID Barrio Sao Paulo (2010).

For its part, ID Estéticas Transversales has produced several similar versions of a project in the Spanish cities of Manresa, Mataró, Vilanova i la Geltrú, Avinyó, Huarte, Burlada and Villava. The projects connect artistic practices, educational activities and social spaces in medium-sized cities. The typology of these cities led to fieldwork on the kind of articulations existing between urban and rural spaces, and, consequently, into an analysis of how these bordering spaces affect the social body that inhabit them. The proposals born from the cooperative activities coordinated by Idensitat focus their attention on the need for perceptual changes regarding relationships and the visibility of the social space and its inhabitants. This change in perception regarding one's own context is necessary in order to make lifestyle changes.

ID Estéticas Transversales understands artistic practice as an activating force of different fields of action flowing transversally through them:

> Bringing together projects which, taking the arts as a medium for experimentation and action, impact upon unique elements of each of the participant cities, and which bring these elements together based upon common themes and shared strategies. The programme deploys transverse processes between artists, educators and active agents in social space, places where the connections between urban space, rural space and the natural environment shape unique realities.

Certainly, we find a clear parallel between the role of the Transition Designer and his or her role as a facilitator and coordinator of organizations. As Guy Julier noted:

> The role of the Designer becomes a 'facilitator', which does not necessarily mean that designers have less power or that their work is limited to organize and materialize the wishes of a group of individuals, but must take advantage of their experience to...challenge the collective imagination and to create new dispositions. In doing so they reconnect the public, practices and location (Julier, 2010).

Theory of Change: Creative Processes as Agents of Change in the Social Space

We would structure project Idensitat's theory of change following Iñigo Retolaza Eguren's methodology, based on the following points: the desired change, the starting points, the interventions and routes of change, and indicators.

1. The desired change:
- The social space is empowered to self-manage its welfare.
- Creative processes are used by citizens and institutions as agents of social change.
- The change is transformational, that is, flexible and fluid, acting on temporary readjustments in order to maintain "realities which are politically, socially and economically fairer and more equitable" (Eguren, 2007).

2. Starting points, actors of change and institutional balance:
- Social space residents express their wish to change their context and the perception they have of it (cognitive institutions).
- The interdisciplinary agents act as collaborators that develop creative processes (cultural institutions).
- The project is linked to local entities involved in the issues which are dealt with (associative institutions).
- The project has the support of some of the formal institutions affected (constitutive institutions).

3. Interventions and route of change:
- It is important to constitute a platform as an urban observatory of each project.

- All actors involved should be gathered to facilitate dialogue among parties.
- Gathering agreements and activities between collaborators is necessary.
- The project is linked to educational programs and/or university research.
- There is a set meeting point for participants during the development of the project. There is a common place to show or display the work that has been carried out.
- Visibility is granted to the issues treated and the intervention process through communication actions.
- Project methodologies are adjusted to other environments, transforming that which is local into a global network.

4. Indicators: Indicators include the following:
- Detecting the use of creative processes by groups of citizens;
- Adopting methodologies of creative processes by institutions;
- Increasing research in art and design regarding this paradigm.

Art and Design Processes to Visualize Social Relationships: An Activist Strategy to Transition

Idensitat was born in 1999 as a public and independent call for artistic and interdisciplinary participation in the Catalan location of Calaf. Public space intervention projects were called for, particularly those related to the local context and engaged in the social environment. Over the years, Idensitat has widened its scope of action and modulated its tenets, but it has maintained its alternative and independent spirit with respect to the artistic, educational, cultural and social institutions with which it collaborates. Idensitat depends on several regional and municipal subsidies, but they are granted by different organisms, and the project is not attached to any institution in particular; therefore, it does not have to justify its results or position before a single thought entity.
Projects developed by Idensitat clearly diverge from the socio-economic paradigms of the prevailing neoliberalism. They instead opt for creating solutions to social space problems in collaboration with citizens, with horizontal hierarchy dynamics, generating cooperative organisational structures while involving and engaging local institutions. Collaborating entities are not private entities that promote themselves commercially. The projects are collaborative and open, and therefore act with a holistic view and attitude that does not yield to unidirectional worldviews or single-minded perspectives and ideologies.
This collaborative, open and holistic perspective gets to the heart of both art and design. In Idensitat projects, art is understood as an "artistic" practice of intervention on reality with the aim of promoting changes in points of view and lifestyles in the environments worked upon. For this reason, its bonds with the place are fundamental, as expressed in one of its inaugural texts: "…experimenting with the place to transform artistic practices and experimenting with artistic practices to transform the place".
Every Idensitat project develops artistic and design practices in collaboration with people and organisations that work in local contexts. For example, project proyecto ID Barrio Eix Besós works on the issue of isolation-connection between three neighbourhoods in Bar-

celona bordering river Besós - Bon Pastor, Trinitat Vella and Baró de Viver. The peripheral location of the three neighbourhoods and the economic difficulties of a segment of their populations are factors that have influenced the territorial segregation and lack of attention on the part of institutions for many years. In the last decade, the situation has been reversed with municipal investment in infrastructure, cession of facilities, urban regeneration and the recovery of the river for use, enjoyment and recreation.
This recuperation process has been made possible by the intervention of neighbourhood and popular movements traditionally linked to collective vindication struggles for the improvement of the common (Marina Garcés, 2013). The task of Idensitat is to join this existing context and to create a platform that acts as an urban observatory for experts, artists, designers and local agents to collaborate in the research and production of proposals and solutions to the lack of connection between the three neighbourhoods.
Design is approached as "investigation through" design in a live laboratory, empathically engaged with the environment on a co-creation basis. In fact, artistic practices also can be interpreted as research. Both in the design and the artistic development, the focus is on the process of collaborative development more than on the solution of the problem posed and final product. In this sense, contextual artistic practices and the design of services and/or systems share dematerialized and systemic views of the creative process.
One of the objectives of ID Barrio Eix Besós is to grant visibility to the existing social relations in the three neighbourhoods, relationships that have been hidden for a long time due to territorial isolation and the lack of public spaces to meet and interchange. Nicolas Borriaud called this situation "relational riffraff" (Borriaud, 1998) an invisibilization strategy carried out by certain nations in order to destroy relational capacity in public spaces. This strategy intended to sweep away from public spaces those structures that could foster alternative discourses and/or generate dissident thinking.

Conclusion: Systemic Creative Practices as a Methodology in Transition in the Face of Wicked Problems

As discussed above, the Contemporary Design course of the Master's Degree in Art and Design Research at EINA-UAB is taught by Idensitat's Director, Ramon Parramon, and by Transition Designers Mercè Rua and Adrià Garcia i Mateu, with the occasional collaboration of Cameron Tonkinwise, CMU scholar and expert in Transition Design. The results from sharing these three points of view on transition –together with the interaction between an actual project and the educational field– will be one of the lines of study followed by the Research Group.
The introductory text of the course establishes the initial connection and fieldwork from which to interact: "systemic creative practices and spaces in transition". The articulation of what is systemic involves detecting and managing complexities that are related to other levels of reality. From this position, it becomes inevitable to understand artistic practice and design practice as non-autonomous disciplines, with the ability to connect and be connected to multiple agents. Analysing this practice from an extra disciplinary approach places us in a favourable position to face the development of processes, their multiple so-

Figure 1.

Figure 2.

Figure 3.

Figure 1. Word Space Project. Gestió ciutadana. Idensitat 2013. **Figure 2.** Word Space. El carrer és nostre. Idensitat 2013. **Figure 3.** Dispositivos In-Out. Idensitat, Barrio Barcelona 2015.

lutions and the decision-making based on a management of complexities. This approach prioritizes the creation of systems over the creation of objects, guiding them to spaces undergoing transitory processes (Parramon, 2017).

Systemic creative practices, including art and design (Parramon, 2017), have a flexible and changing structural constitution adequate for addressing projects that fall within the definition of wicked problems. The wicked problems, to which Transition Design draws its attention, have that condition of indeterminacy which Richard Buchanan distinguished from the undetermined and which, according to the author, was best approached from an interdisciplinary action where art and design could collaborate (Buchanan, 1992). The Idensitat projects that we have cited throughout the article have impacted public and social

spaces with a transitory nature, places where various wicked problems converge: environmental degradation, educational deficits, urban ills and social inequity. In public spaces in transition, there is no possibility of isolating a single wicked problem upon which to focus actions. The 10 points for identifying wicked problems proposed by Rittel in 1972 retain validity in the exercise of detecting them in public spaces in transition, where they emerge in plural. Doing a reverse analysis exercise, that is, trying to identify those 10 points from the work process of systemic creative practices is also a way of clarifying them and making them emerge towards the visibility needed to solve them.

To conclude this article, we have used the concept of "systemic creative practices" as a proposal to encompass different types of constellations-of-actions developed in design and art projects in favour of transition. We also have recovered Rittel's original definition of wicked problems and Buchanan's classic one, because the link between the creative processes of art and design is better explained using these perspectives over others.

We would also like to highlight that this article serves as an account of a research process following a symposium format designed as a "tangible event" through which to generate the research itself: the writing of objectives, the choice of case studies, the design experiences within the symposium, the academic communications session, the publication of a volume in the university journal with the resulting content and, finally, the writing of this essay all developed as a research exercise "on" and "through" design and art.

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Resumen: Este trabajo analiza una serie de proyectos de transición en curso en la ciudad de Barcelona y la región de Cataluña, utilizando el marco de Diseño para la Transición. Los proyectos seleccionados se centran en elementos bastante estructurales de la transición social, como el horario de trabajo, la energía, la vivienda, la infraestructura de Internet y la cultura. El fondo del estudio es una conferencia realizada en junio de 2017 bajo el título "Perspectivas del Sur en Diseño para la Transición" en EINA, la Universidad de Diseño y Arte de Barcelona (UAB). El estudio analiza cada proyecto utilizando la Plantilla de Estudio de Caso de Transición con el fin de generar reflexiones para cada sector, coordinar sus esfuerzos y determinar qué perspectivas del sur, si las hay, surgen de contextos locales.

Palabras clave: Diseño para la transición - iniciativas ascendentes - perspectivas del sur - transición social - Barcelona - prácticas creativas sistémicas.

Resumo: Este trabalho analisa uma série de projetos de transição que se desenvolvem na cidade de Barcelona e na região de Catalunha, utilizando o marco do Design para a Transição. Os projetos eleitos se centram em elementos estruturais da transição social, tal como o horário de trabalho, a energia, a habitação, a infraestrutura de Internet e a cultura. A base do estudo é uma palestra realizada em junho de 2017 denominada "Perspectivas do Sul em Design para a Transição" em EINA, a Universidade de Design e Arte de Barcelona (UAB). O estudo analisa cada projeto utilizando o modelo de Estudo de Caso de Transição com o propósito de gerar reflexões para cada setor, coordenar seus esforços e determinar que perspectivas do sul surgem de contextos locais.

Palavras chave: Design para a Transição - iniciativas ascendentes - perspectivas do sul - transição social - Barcelona - práticas criativas sistémicas.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Words Into Action: Making and Doing Transition Design in Ojai, California. A Case Study

Steve Hamilton *

Abstract: This paper assesses the practical deployment of Transition Design in Ojai, California, a small U.S. city facing a potentially existential water crisis stemming from complex water-system relationships between many conflicting stakeholder groups. The area's physical isolation engenders a powerful sense of community, while the diversity of the population makes collective action frequently contentious. The case study describes two early 2017 Transition Design workshops that brought together diverse constituents, facilitated shared visions of preferable futures, and inspired some Ojai participants to try to launch a Transition Design office to weave the practice into their community and inspire new collective behaviors targeting a variety of problems and goals.

Keywords: Transition Design - sustainable design process - wicked problems - stakeholder relations - design futuring - backcasting - participatory design - community generated design.

[Abstracts in spanish and portuguese at page 212]

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This paper reports on one of the first practical applications of the Transition Design process that is currently taking place in Ojai, California. Transition Design is being developed at Carnegie Mellon University (CMU) as a practice to address complex issues such as climate change, forced migration, poverty, crime, etc. The recent California drought, which affected the city of Ojai incommensurately, and polarized community sentiments in response, made this area an ideal case study for Transition Design in practice.
The Ojai project began with two workshops that engaged a diverse group of stakeholders from the community in a Transition Design process facilitated by Terry Irwin and Gideon Kossoff in January 2017 and Irwin, Kossoff, and the author in May 2017. By exploring a long-term solution process for the catastrophic drought conditions the valley has been

suffering from for many years, and which remain unabated despite a winter that brought record rains and snowfall throughout the state, the workshops not only revealed areas of conflict between a diverse group of stakeholders but also fostered a new sense of optimistic hope for a collectively generated long-term solution to Ojai's chronic water woes.
The content of the workshops was well documented in two papers uploaded to academia.com in January and May 2017 (Irwin & Kossoff, 2017; Irwin, Kossoff, & Hamilton, 2017). This paper explores the dynamics achieved during the workshops and how they catalyzed the community's perspectives on water by viewing the crisis through the lens of a Transition Design process.

Ojai, California and the Need for Transition

Several factors make the water shortage in Ojai an ideal case study for the Transition Design process. These features include an open-minded population with a history of countercultural and progressive thinking, an active crisis (severe water shortage), a geographically isolated location that amplifies the need for local action, and a manageable scale that makes the goal of engaging virtually all citizens of the valley in the process of developing long-range solutions relatively realistic.
Ojai is a geographically isolated but politically and economically diverse community just an hour and a half north of Los Angeles and 20 miles inland from the beachfront community of Santa Barbara. This small city (population 7,461 according to the 2010 U.S. Census) includes funky yoga centers and meditation retreats, a world-class golf resort, and plenty of water-hungry citrus groves carpeting the valley floor and hillsides. The area nurtures a wide range of political perspectives, having long been a magnet for countercultural thinking, and is now increasingly becoming a location for second homes and tourism catering to a wealthier demographic escaping the clogged freeways of Los Angeles (and who many longtime residents argue are, in turn, hopelessly clogging the single road bisecting the valley that leads into and out of town). Several multigenerational farming operations engage in an active citrus growing industry that supports diversity in the valley by attracting a sizable immigrant population to provide necessary labor, but as is the case in much of California, the working class is increasingly being priced out of a rapidly appreciating real estate market. The advocacy group House Farm Workers (2017) estimated there are 36,000 farm workers in Ventura County which includes Ojai, noting that the average annual salary is $22,000 a year while the average rent is $20,000 a year.
On paper, Ojai embodies many of the diverse and conflicting dynamics that make up the Golden State of California. One thing that every resident stakeholder we met seems to agree upon is that Ojai has a culture all its own. The stakeholders just cannot agree on exactly what it is. We deployed Transition Design in the Ojai Valley to try and help them find out.

The Genesis of the Ojai Workshops

The first 2-day workshop introduced the principles of Transition Design and yielded a map of the stakeholder landscape related to water. "Enabling participants to go beyond 'what is' and imagine 'what could be'... the visioning and backcasting segment of the workshop enabled people to think beyond current limitations and glimpse a common future and a pathway toward it" (Irwin & Kossoff, 2017). This proved promising enough to participants (including concerned citizens, business people, artists, and even the mayor) that a second workshop was scheduled to deepen the learning and engage additional stakeholder groups. The second workshop dug deeper into the beliefs and assumptions of the different stakeholder groups while allowing more time to explore the futures visioning processes targeted at reducing conflict while emphasizing areas of synergistic thinking. Together, these two workshops paved a way forward for Transition Design practice by providing a forum and a meaningful case study that tested theories and practices being researched and developed at CMU's School of Design.

The invitation to hold the Transition Design workshops came from a small group of citizens committed to water security in Ojai who had been catalyzed for action through a lecture given by water expert Tom Ash at the Ojai Retreat in April 2016. During the lecture, Ash identified the unique problem that Ojai faced in terms of water and framed it as a potentially existential threat for the community, citing that they could virtually run out of water in as little as 5 years, prompting a group of concerned citizens to convene at a private home for a dinner to discuss the problem. To help spread the alarm, this group organized another, more widely attended talk, sponsored by the Ojai Green Coalition, that took place on May 26, 2016. They then formed an action committee, The Ojai Valley Water Trust (OVWT), which held its first meeting on August 14, 2016.

The OVWT initiated contact with CMU after a member learned about Transition Design by watching Terry Irwin present at the 2016 American Institute of Graphic Arts (AIGA) National Conference in Las Vegas, and within a short time, they had invited Irwin and Kossoff to facilitate the first workshop on January 27 and 28, 2017.

Reacting to an Emergency by Thinking Fast and Slow

Ash's 5-year time frame created the sense of urgency that organizers sought to capitalize upon, but this same urgency also makes it difficult for participants to exercise the patience needed to slow down and evaluate the sweeping landscapes of the problem. Understandably, with an active group targeting a potentially existential threat to the community, it has not been easy to temper the group's desire to rush toward quickly quantifiable solutions that could offer short-term respite but that do not necessarily embody the long-term systems-level changes that Transition Design seeks to engender in order to form more lasting and sustainable lifestyle-based solutions. As noted above and discussed further below, this fundamental shift in thinking to longer-time-frame solution-landscapes remains one of the foremost challenges of the Transition Design practice which is "at odds with 21st century expectations for quick, conclusive, profitable and quantifiable results" (Irwin, 2017).

Nevertheless, this highly motivated and intensively activated group proved instrumental in garnering the support necessary from key community players (from the management of The Ojai Valley Inn and Spa who provided space for the workshops to city council members, city planners, and even the mayor, all of whom attended) and laid the groundwork for two well-received workshops. Although the workshops further catalyzed and inspired this highly activated base, as noted in Irwin's discussion of the emerging process, the coevolving areas of Transition Design (vision, theories of change, mindset, and posture) that all proceed through a practice of open collaboration and self-reflection, before finally "designing interventions", means that the practice must be given time, and "results" may not emerge for years or even decades (Irwin, 2017).

In the end, an activist focus and energy proved instrumental in the launching of this initiative in Ojai. Designing tools and tactics for maintaining this activist energy over the extended time frames required for a successful Transition Design practice to unfold –as punctuated as it needs to be with periods of waiting, observation, and research– remains one of Transition Design's most urgent areas for development.

The Stakeholders Represented in the Ojai Workshops

The two Transition Design workshops, facilitated by faculty from Carnegie Mellon University, were held at The Ojai Valley Inn and Spa on January 27 and 28, 2017, and May 5 and 6, 2017. The initial workshop was attended by a diverse group of committed community leaders; however, they determined that some important perspectives were missing. For the second workshop, the organizers identified and recruited six stakeholder groups (water experts, farmers, environmentalists, business people, politicians, and residents) after noting that water experts' and farmers' perspectives were noticeably absent in the first workshop (Irwin & Kossoff, 2017). An attempt was made to include at least one or two genuine members from each constituency, but in some cases (particularly with farmers unwilling or unable to get away from work for 2 days during the busy spring season), a proxy had to be identified. During the second workshop, a homeowner who cultivated a small orchard on his property and a permaculture expert who works with many of the farmers in the valley were asked to contribute the farmers' perspective as best they could. The perspective these two participants offered benefited from insights gained through small-scale farming and larger-scale consulting engagements with farmers but lacked the visceral intuition of one who has spent a lifetime dancing with the elements while his or her livelihood was at stake. Ultimately, it is believed that in order for a participatory, holistic, systems-based solution-landscape to emerge, stakeholder research must include genuine input from all stakeholders. This input not only informs the derived interventions but including all voices early and throughout the process also helps ensure the buy-in required to successfully sustain the long-term, wide-scale, behavioral, and mindset changes that Transition Design practice hopes to engender within its targeted design intervention landscapes.

An illustration of this occurred several months later at a fundraising dinner for the proposed Transition Design center that was attended by one of the area's prominent citrus growers. After noting that the farmers had been feeling totally left out of the conversations

about water until that evening, he defending the fundraising goal suggesting that "while 150,000 dollars (the projected cost for the first year of a Transition Design center the community was trying to start) might sound like a lot of money" he'd spent nearly twice that on maintenance for his irrigation system this year alone (Workshop participant, August 24, 2017). Unexpectedly but perhaps not surprisingly, a multigenerational farmer, quite familiar with making long-term capital investments, and with a visceral stake in the effects of water shortage and climate change, had no problem seeing the benefits of adopting a long-range view in implementing the changes necessary to overcome the water crisis. His comments at the fundraising dinner provided evidence of the benefit of including all voices in the conversation revealing that support and insight may emerge at any time and from unexpected places.

Another serendipitous example of the need to include all voices in this conversation came at the end of this same dinner after everybody had left and while we were packing up to leave. One of the servers approached and asked about the process we'd been discussing throughout the meal. He said he was a student living in what he described as "a poor community" on the edge of the nearby city of Ventura. He was studying health care in college and hoped, after graduation, to help provide access to better health care to members of his underserved community. He said he was

> disappointed that he'd been assigned to work the dinner because he wanted to work outside, [it was a beautiful evening, and the resort has many outside patio dining areas], but now [he was] happy that [he'd] worked the dinner inside because the conversations and the process described was so inspiring (Workshop participant, August 24, 2017).

The goals and inspiration shared by this young man who had accidentally been given a seat at the table provided an inspiring example of the untapped potential of community members often left on the sidelines during attempts to address complex community problems.

The Importance of Stakeholder Engagement at Every Stage of the Process

One surprise during the second workshop was the shortage of participants available to represent the residents' stakeholder group. Because virtually all participants were residents, it was taken for granted that this group would be easy to fill, but all but one participant fell neatly into other categories forcing us, as with the farmers, to identify a proxy to fill out the residents group. When we, along with the local organizers, assigned a participant to fill this much-needed slot we encountered an unanticipated resentment. It turned out that the chosen participant owned a small business in town, and as the day went on, it became evident that the participant was disappointed not to be included with the business people. This provided an obvious but valuable reminder for the facilitators that participatory practice should extend to all stages of the process, and if you want broad and open participation, even seemingly benign decisions should be made with input from everybody involved.

The inability to field a comprehensive stakeholder base to participate in the workshops was offered as evidence by the organizers that confirmed the need for a next step in Ojai's Transition Design process that included professional qualitative research to complete the picture and validate the hypotheses and insights the workshops had provided. This research would be aimed at capturing the perspectives of all stakeholders, not just proxies, and would extend well beyond the six broad groups practically identified for the purpose of these workshops. Additional stakeholder groups to include in the conversation about Ojai's water security should include migrant workers, the less affluent, and indigenous people, three groups whose voices are seldom included in community consensus. Research itself may also reveal other meaningful subgroups whose perspectives should be included. As noted by Irwin elsewhere in this journal, "User and human-centered design approaches seldom have the objective of identifying *all* affected stakeholders and their concerns" (Irwin, 2017), and developing a framework that insists upon the importance of this objective is emerging as central to the practice of Transition Design.

In addition, these categories were organized for purposes of the 2-day workshop, and participants were asked to dig deeply into sharing a specifically narrow perspective through a variety of lenses and framing exercises. By necessity, we asked them to artificially focus their perspectives for these 2 days of immersive engagement. More traditional qualitative research would attempt to capture a stakeholder's perspective while embracing all of the nuances of what may well be a multivalued perspective. This further emphasizes the need to supplement these workshops with in-depth qualitative research throughout the community in order to not only gain insights but also to nurture the sense within all stakeholder participants of having their perspective fully heard and held within the context of the Transition Design practice and the interventions that emerge from it.

Including Stakeholders in the Solutioning Process

The perspective of including all stakeholders not only in the identification of wicked problems but also in the development of collectively engaged solutions is leading the Transition Design practice to embrace a variety of approaches from the social sciences that "as yet have not been integrated into traditional design processes" (Irwin, 2017). As shared by Irwin elsewhere in this journal, these include "Participatory Action Research, Multi-stakeholder Governance, Multi-Stakeholder Processes and Stakeholder Analysis" (Irwin, 2017), and we attempted to include several of these practices in the Ojai workshops.

The second workshop began with each stakeholder group identifying their hopes and fears. A dry erase form was provided to make the process less precious, allowing participants to scribble and erase, refine and rewrite, while preventing the posted canvases from becoming overly messy with crossed-off changes of heart. Some surprising affinities emerged through this process, and it launched the group toward a more empathic engagement right from the beginning. Farmers saw the water shortage and the decimation of their livelihood as feeding a "Loss of Pride" and a "Loss of Identity." Residents, who had expressed frustration at being asked to ration water when oft-cited statistics show that 80% of it goes to agriculture (Guo, 2015) expressed fears that the water shortage would

lead to a loss of "Community Identity" and also shared a fear of a "Loss of Agriculture." These residents' insights indicate a shared vocabulary with farmers by emphasizing "identity" and reveal a fondness residents feel toward their agricultural neighbors that had not surfaced during previous public discourse. We hope that this was made possible thanks to safe boundaries created by the structure of the workshop exercise.

At the heart of Transition Design practice lies a firm belief that wicked problems will be solved only through collective action. These small wins in which affinities are revealed begin to bridge conflicts that stand in the way of multistakeholder interventions. Identifying, modifying, and further developing tools that facilitate empathy and cooperation between stakeholders with potentially differing agendas, whether borrowed from the social sciences, the political sciences, or elsewhere, is an important priority as the Transition Design practice continues to be developed.

Identifying and Dealing with Stakeholder Group Biases

Of all the biases revealed by the activities during the second workshop, one of the starkest emerged during efforts to imagine lifestyles in a water-secure world some three and a half decades into the future in 2050. The primary motivation behind framing the exercise around lifestyle-based visions of the future is a belief that this allows participants to distance themselves from current technological solutions and their expected outcomes. Placing the vision sufficiently far into the future during such exercises also seeks to decouple the imagined outcomes from a direct causality resulting from actions taken in the present. (Of course, the ultimate goal is action in the present, but the goal of our workshop activity was to backcast into present-day activities after first separating ourselves from them, a process that is discussed further below and is discussed by Irwin (2017) elsewhere in this journal.)

The water experts who clearly felt an ownership of the problem being explored and embodied such a deep and visceral technological connection to it found it was extremely difficult for them to steer clear of precisely the kind of one-off, technologically focused, results-oriented solution that Transition Design hopes to transcend. During this exercise, they clearly had the most difficult time of any of our stakeholder groups separating their thinking from a vision where the technological infrastructures they currently advocate had all come to pass and brought about the water-secure future of our dreams. Who can blame them? They spend their days designing, advocating for, and implementing precisely these solutions.

In an effort to free up their thinking and immerse them more in the spirit of the activity which we had hoped would generate real and inspiring flights of fancy, we encouraged the water experts to imagine themselves stopped on the street regularly for selfies with local residents who regarded them (appropriately, one would argue) with the reverence normally accorded to rock stars and Emmy-winning actors rather than public works managers. They found this amusing, and perhaps even appealing, but remained mired in their perception that if the community just gave them enough money and got out of the way their technological fixes would bring about a world where everybody flushes their toilets regularly and often before walking barefoot across a lush green lawn and slipping back into their solar-heated swimming pools.

Perhaps these water experts are simply too accustomed to dealing with infrastructures, projects, and planning that are already executed within timelines of decades, and thus, the future we sought was not far enough out to shift their thinking. However, alas, their vision of the future stemmed almost entirely from the realization of technologies, a desalination plant, a connection to the state water supply, and the increased availability of recycled water, which have already been proposed, all of which would take decades and tens of millions of dollars to implement, and none of which consider the impact of changing stakeholders' mental models of how water is woven into our lifestyles and habitual behaviors. One could even argue that by focusing entirely upon the supply side of the equation the solutions dreamed up in the engineering- and infrastructure-oriented minds of the water experts merely give permission for status quo mindsets to be perpetuated.

This in no way suggests that Transition Design practice rejects or belittles expertise and technological development. Instead, the developing practice emphasizes that complex system interventions require solutions implemented on multiple levels of scale and time frames and with varying degrees of technological expertise working in concert (see Irwin's discussions of the Winterhouse social pathways matrix and the power of "linking and amplifying projects" elsewhere in this publication; Irwin, 2017) so that a solution landscape emerges that imagines behavioral and mindset changes that provide a more sustainably powerful landscape within which engineering and technological breakthroughs and implementations can be deployed. Developing the tools to overcome an expert mindset within the context of a Transition Design practice that proposes nonexpert approaches to nurturing multistakeholder contributions to solutions, and holds paradigm shifting mindset adjustments at its core, remains a daunting challenge, but nowhere is it more evident than in learning to engage with the input of experts without being swept into the comfort of a belief that a technological silver bullet lies tantalizingly just beyond the horizon.

Affinities Mapping and Collective Visioning Smooths Over Conflicts

While the first workshop was executed largely using traditional Post-it note paste-ups, feedback and reflection afterward revealed a few problems with this method. Although the practice is common for this type of workshop, "participants tended to write single words that had meaning for them in the moment, but were not clear to other participants and provided a fragmentary/cryptic record" (Irwin & Kossoff, 2017). In addition, some participants, unfamiliar with the challenges of working in settings that demand fast-paced creative output, were unclear about or intimidated by the exercises. Consequently, a good deal of effort went into preparing canvases for the second workshop that provided instructions, examples, and structure for the exercises (See Figure 1). The canvases were laminated and dry erase markers provided, giving participants the ability to write and erase with impunity as they brainstormed and refined their visions and responses. (An unintended consequence of these dry erase canvases is that they introduced a need to vigorously police the presence of permanently marking Sharpies during the 2 days. A distraction the organizers would have gladly done without!) Overall, however, the gambit paid off with rich and detailed input from virtually all participants, and we attribute at

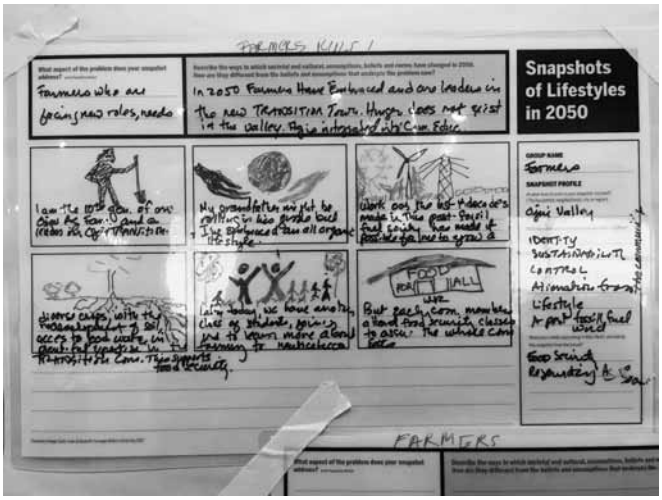

Figure 1.

Figure 2.

Figure 1. Based upon feedback provided from the first workshop, Carnegie Mellon University (CMU) facilitators provided more structured dry erase canvases that made the exercises and outputs clearer for participants. **Figure 2.** Using paper tape instead of string to identify connections between different stakeholder canvases allowed participants to annotate their connections amplifying the communication between groups.

least some of this to the freedom to erase, rewrite, and refine, the clear examples allowing participants to better understand what was expected and the structured framing for the output of every exercise that was provided by the canvases.

Throughout the second workshop, participants were asked to post their work by taping the canvases on the wall in a manner that allowed them to draw connections and conflicts between different groups using paper tape and markers. This method provided an effective way to get them working together between groups and began the process of building empathy for their varied perspectives. The lack of pin-able walls forced us to provide paper tape to draw the links, and although the classic tacks and string might have been less messy, allowing connections to be made via less circuitous routes, the paper tape afforded participants the added ability to annotate the connection providing additional context for the links they had discovered (See Figure 2). In practice, although the tape proved slightly awkward, it actually helped defuse the potential for tension created when conflicting perspectives were posted, helping generate a more playful and cooperative environment. At each phase of the process where canvases were posted and the group asked to collectively search for connections and conflicts, positive energy flowed in the room, and the bonds of community became more evident as these conflicting stakeholders were forced to work together to look for connections and find routes for their web-like paper tape pathways (See Figure 3).

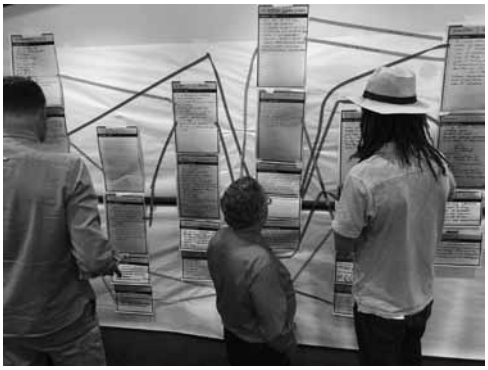

Figure 3.

Figure 4.

Figure 3. The canvases and tape provided ample opportunities for workshop participants from all backgrounds to work cooperatively identifying connections and conflicts. Many connections between hopes and fears were identified.
Figure 4. After the workshop in which participants explored future visions framed around lifestyles, the participants' backcasting process revealed many alignments between the proposed steps on a transition pathway toward a water-secure future. (Green tape indicates alignment between proposed projects.)

Backcasting Toward Desirable Futures

The final exercise of the Ojai workshops provided a critical bridge from theory and research toward action within a context that places proposals into a landscape benefitting from contributions by all stakeholders. Building upon the power of imagining future lifestyles to enable jettisoning current or expected solution trajectories, backcasting seeks to shift perspectives from what is likely to happen to ways in which what is desirable to happen might be brought about. Irwin (2017) quoted Robinson: "the major distinguishing characteristic of backcasting analysis is a concern, not with what futures are likely to happen, but with how desirable futures can be attained". Thus, workshop participants were asked to "create a transition pathway from the present to their 2050 vision and use post-it notes to speculate on what projects, initiatives, and milestones would be necessary (between the present and 2050) to achieve the vision" (Irwin, 2017). By focusing on lifestyles instead of specific solutions, a surprising amount of synergy between the future visions of each stakeholder group emerged. During this final exercise, we asked each group to provide three possible present-day solutions leading to their envisioned future and five of the six groups proposed an educational initiative (See Figure 4). Meanwhile, politicians recommended policies to incentivize water-conscious building practices and planning that seemed totally aligned with the requests of environmentalists to develop water-conscious neighborhood team projects (which could be addressed with building projects) while also asking for changes to the way stormwater is handled (addressable through planning policies).

In Summary: From Hopes and Fears to Future Visions

Identifying their hopes and fears revealed many conflicts between stakeholders but also identified many affinities between groups that community members had previously characterized as at odds. Developing narrative visions of future lifestyles and then backcasting into present-day initiatives even further revealed how much potential cooperation there was. "Transition Design proposes backcasting as a collaborative activity in which stakeholder groups can leverage their visions of desirable futures to inform tangible, consensus-based action in the present" (Irwin, 2017). We believe that further research will show that although many conflicts within communities emerge when discussing solutions-based approaches to complex problems, by slowing down the process and shifting the conversation away from specific solutions toward lifestyle narratives more synergy of perspective will emerge. During the workshops, by pushing the mindsets well into the future and framing goals through the lens of lifestyle, we found that contentions began to melt away, and more alignment emerged. From the politicians' belief that "it's our water, not my water" to the residents' belief that "access to clean affordable water is a basic human right", and from the farmers' belief that "food and water basic rights will be proven in courts" to the business people's belief that "water will not be a commodity", it was clear that, stripped of a need for specific solutions about how to get there, a heartening amount of synergy existed across all stakeholder groups around the importance of celebrating water not as a business commodity for trade but as a basic human right.

Final Reflections on the Workshop Experience

At the end of the final day of the workshops, time was taken for all participants to share their experience and what it meant to them and what they felt it meant to the Ojai community. One long-time resident noted that the open dialog engaged in during the workshops "felt like the old days" in Ojai and went on to lament that so many of the issues currently being faced, such as the water shortage, short-term vacation rentals, and a more transient population, were being handled with rancor and personal attacks through the impersonal communication threads of Facebook groups and Twitter. She missed the days when Ojai's relative isolation made it feel more communal and interactions often took place on the streets with a powerful sense of belonging and place. Another participant hoped that this practice could not only help Ojai achieve water security but would also build ongoing communication channels that could ease tensions around zoning, development, and sustainable city planning initiatives. These sentiments of what could only be described as relief surrounding the civility and openness of the conversations that had taken place during the workshops were echoed again and again throughout the room.
Clearly, the participants emerged with a sense of optimism about the practice, and many wondered what the next steps could be, hungry to take the process further, and recognizing that the workshops were only the first step toward the participatory community practice of Transition Design that had been modeled. In final summary remarks, Irwin emphasized what had been repeated throughout the four days of the two Ojai workshops.

That these workshops were models of Transition Design developed to introduce the practice to the community and for them to evaluate the process to see if they thought it could take hold in their community and start Ojai on a long-term transition process toward sustainability through stakeholder equity and participatory design practices. The next step ideally would be to conduct research to validate the findings surfaced in the workshops, broaden the scope of insights, and ensure that all stakeholder groups within the community are represented. Efforts are now under way to fund a full multistakeholder research project throughout the Ojai Valley focusing on issues surrounding water security.

How to Sustain an Em(Urgency)

Inspired by the experience in these workshops, one group also decided they would try to raise money and start an Ojai Transition Design Center (OTDC) in the middle of town that would not only pursue a water-secure future, but that they hoped would also inspire the community to embrace the ethos and practice of Transition Design as integral to the cultural fabric of Ojai and implement it to solve a wide range of ongoing issues that have fueled contention between resident stakeholders.

One of the biggest hurdles to establishing the OTDC is developing leadership within the community to sustain such a long-term initiative committed to slow change. Ojai has several charismatic and passionate individuals who have rallied around issues ranging from preservation to environmental protection and education to tourism. Nevertheless, most remained on the sidelines despite expressing interest in and support for the process. One community member who participated in both workshops and played an active role helping to organize them shared that her spouse, who has spearheaded several successful grassroots initiatives in the past, is "an activist, he can't really see how he'd fit in to this process" (Workshop participant, September 21, 2017).

This perception emerged regularly throughout the process in Ojai inspiring the title of this section. It represents one of the biggest challenges facing any process targeting complex systems change. How do you create and maintain an activist's sense of urgency for a problem landscape requiring multiple interventions and operating over years if not decades? Boyer, Cook, and Sternberg (2010) of the Helsinki Design Lab reminded us that you should "never waste a crisis", and Ojai's water shortage has motivated a committed group of people and policy makers to begin taking action to solve this particular one. As the practice matures, we need to help them stay focused by identifying multiple stages and targeted intervention points to help maintain a sense of engagement with the process. We need communications that highlight multiple milestones of accomplishment and break the process down into regular small wins that will keep enthusiasm for the process alive and maintain the urgency and engagement of personality types who are drawn toward activism and leadership but whose very strengths as leaders render them prone to boredom or burnout when the measurements of success are neither obvious nor certain.

Having engaged with the Ojai community over the past several months through the second workshop and helping to weave Transition Design into the fabric of the community while laying the groundwork to launch the Ojai Transition Design Center, it has become clear that

one of the most pressing concerns facing those of us interested in enacting systems-level change over protracted time scales is developing communication tools and motivating activities that can sustain the passionate urgency of activism while engaged with a process that requires infinite patience, long periods of study and reflection, and decades of persistence. For now, I leave you with the mission statement of the yet-to-be-launched Ojai Transition Design Center.

Mission Statement of the OTDC

The Ojai Valley faces a variety of challenges affecting the community's daily needs, and long-term solutions, hampered by the area's conflicting social and bureaucratic ideas and ideals, have been difficult to come by. Problems like water use and the drought, affordable housing, education, and transportation are multifaceted; they cannot be solved with typically designed solutions. They can be unlocked only by changing the culture in which these complex problems emerged.

Transition Design targets these problems through a practice that encourages all those affected to participate in developing a culture that nurtures solutions. Using this approach, the Ojai Transition Design Center (OTDC) will foster the emergence of newly sustainable attitudes in Ojai by provoking thoughtful conversations and facilitating innovative engagements that cumulatively lead to long-term, broad-based, deeply-rooted change throughout the community.

The OTDC will be a safe and collaborative space, holding workshops and activities that help the citizens of Ojai talk about the issues and reveal underlying consensus that can lead to lasting change. The center will also perform research and outreach that enable contribution by stakeholders who do not normally have a voice in solving problems within the community.

The primary goal of the Ojai Transition Design Center is to make sure that everyone in Ojai has a voice addressing these complex challenges and that the conversation proceeds sustainably, inclusively, and respectfully for all.

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Resumen: Este documento evalúa el despliegue práctico del Diseño para la Transición en Ojai, California, una pequeña ciudad de EEUU que enfrenta una crisis de agua potencialmente derivada de las relaciones complejas entre muchos grupos de partes interesadas en conflicto que hacen al sistema. El aislamiento físico del área engendra un poderoso sentido de comunidad, mientras que la diversidad de la población hace que la acción colectiva sea frecuentemente polémica. El estudio de caso describe dos talleres de Diseño para la Transición de principios de 2017, que reunieron diversos componentes, facilitaron visiones compartidas de futuros preferibles, e inspiraron a algunos participantes de Ojai a intentar lanzar una oficina de Diseño para la Transición para entrelazar la práctica en su comunidad e inspirar nuevos comportamientos colectivos dirigidos a variedad de problemas y metas.

Palabras clave: Diseño para la Transición - proceso de diseño sostenible - problemas perversos *(wicked problems)* - relaciones con las partes interesadas *(stakeholders)* - diseño de futuros - *backcasting* - diseño participativo - diseño generado por la comunidad.

Resumo: Este documento avalia a prática do Design para a Transição em Ojai, California, uma pequena cidade de EEUU que enfrenta uma crise de água potencialmente derivada das relações complexas entre muitos grupos de partes interessadas em conflito que fazem ao sistema. O isolamento físico da área gera um poderoso sentido de comunidade, embora a diversidade da população faz que a ação coletiva seja frequentemente polémica. O estudo de caso descreve duas salas de Design para a Transição de princípios de 2017, que reuniram diversos componentes, facilitaram visões compartilhadas de futuros preferíveis, e inspiraram alguns participantes de Ojai a intentar iniciar um gabinete de Design para a Transição para entrelaçar a prática em sua comunidade e inspirar novos comportamentos coletivos dirigidos a variados problemas e metas.

Palavras chave: Design para a Transição - design sustentável - problemas perversos (*wicked problems*) - relações com os interessados (*stakeholders*) - transições sócio - técnicas - visões futuras - *backcasting* - design participativo - design gerado pela comunidade.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Designing for Transitions: Addressing the Problem of Global Overfishing

Cheryl L. Dahle *

Abstract: Nearly 10 years of applying design process to end global overfishing has led us to significant insights into methods for inventing, executing, and iterating a strategy to drive widespread shifts in human and industry behavior. The article will cover the use of design process to (a) posit a new theory of change; (b) select and incubate scores of entrepreneurial solutions and engage in "amplifying" support strategies to help those disruptive ideas gain traction; and (c) center system stakeholders as designers of their own futures. The article suggests new ways to evolve the field of Transition Design, including new metric frameworks, and argues that Transition Design is the perfect tool to assist philanthropy in crafting the emergent strategies necessary to address complex problems.

Key words: design - fisheries - systems - theory of change - stakeholders - overfishing - philanthropy - diversity.

[Abstracts in spanish and portuguese at pages 232-233]

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In the spring of 2007, I met with a program officer from the David & Lucille Packard Foundation to discuss its sustainable seafood program over drinks at the Clift Hotel in San Francisco. As we took seats on a plush sofa in the cherry-red paneled RedWood Room bar, she shared some of the challenges of the foundation's work, which aimed to scale back global overfishing and conserve marine fishery ecosystems. I was at the time what would be called a systems analyst for the nonprofit world: I worked for an organization called Ashoka and spent my time poring over sets of solutions addressing specific social or environmental problems to find patterns. Those patterns helped me provide strategic advice to foundations like hers. The request that capped her overview of the program was a common one: "Are organizations out there that we should be funding but aren't because we don't know about them?" In other words, find me some new pipeline. Perhaps embold-

ened by my strong cocktail, I lobbed back, "That is a great question. But what if the thing you really need to be funding doesn't exist? How would you know that, and what would you do about it?"
"I don't know", she said. "What do you suggest?"
I excitedly laid out for her an approach I'd been discussing with colleagues that would pair the analysis I typically did for Ashoka with "design process". We would find the holes in the ecosystem of solutions targeting overfishing and then use design to invent something new to fill one of those holes. By the end of my pitch for an approach, she was intrigued. She asked for a proposal within two weeks. The resulting document was beautiful and persuasive, if still risky and relatively expensive. Yet they loved it. With foundation support, my project team launched a research initiative that would span two organizations, 14 months, and multiple continents.
In the 10 years since that fateful conversation, I've convened and worked with multiple teams to apply design process to systems change, to found and build a nonprofit dedicated to that practice in fisheries, and to distill lessons from our journey so that the methods and insights can be applied to other complex, systemic problems. I did not, through most of that journey, have a name for what we were doing. The description of "applying design methods to systems change" proved so universally befuddling or off-putting to most of the marine scientists, fish industry business people, and nonprofit players I encountered that I simply stopped talking about that aspect of the work, instead focusing on the specific benefits or goals of individual projects. I joke that for many years I was under the impression that the name for what I was doing was, "You're crazy and wrong". When Carnegie Mellon's head of school, Professor Terry Irwin, first told me around 2014 that I was practicing "Transition Design", I was relieved to have a term for the work that also came with an emerging field of practitioners and academics pursuing this course.
In this paper, I'll attempt to share the details of our Transition Design approach, what worked and did not, and lessons we were distilling from other disciplines. I am above all a practitioner, not an academic; references to the bodies of research work that contextualize this experience may not be exhaustive. I invite further discussion with academic and research colleagues as we continue to define this field.

A New Theory of Change

From the outset of the project, our goal was to use design methods to find ideas that were missing from the foundation's existing quiver of strategies to counter overfishing. One of the dominant theories of change at the time was that if enough pressure from environmentalists and consumers forced big retailers (like Walmart, Target, and Costco) to buy fish that was "sustainable" (meaning harvested responsibly from stocks of fish with healthy population levels), then a "domino effect" throughout the supply chain would cause fishers everywhere to shift their harvesting practices. This theory was paired with policy change and regulation efforts as well; but the so-called markets strategy was where much of the energy of the nonprofit sector, including the financing from the three or four major foundations funding the activity, were directed. But what that program officer had

articulated to me in our initial conversation was that the theory, some five years into its execution, seemed stuck. She said retailers reported that they had trouble finding sources of certified (or even averred) sustainable fish and trouble getting their suppliers to comply with their requests. Similarly, fishers reported that no monetary incentives existed for them to change behavior, which in many cases involved an expensive overhaul of gear and/or business practices.

Our research team set out in September of 2008 to discover which interventions for sustainable seafood were working and what was missing from this ecosystem of solutions. The full analysis examined three sets of solutions in the field: (a) solutions targeting fishers to persuade them to change behavior; (b) solutions persuading major buyers of fish to change the kinds of fish they sourced; and (c) solutions engaging consumers to influence their purchasing patterns (Ashoka, 2009). This approach was based on creating a method and pattern recognition process to track how solutions in a given ecosystem cluster. The method's strengths include that it identifies areas where few solutions are venturing; these areas of scarcity are holes that are ripe for innovation. It also distills the underlying reasons behind successful approaches, providing potential guidelines, or rules, for the creation of new ideas. The approach was developed as a way to help foundations craft or refine their approaches to grant making, but it turned out to be a perfect setup for the re-framing and ethnographic work required by the design process. It gave us both a map of the landscape of current activities and familiarity with the key players in the ecosystem.

The method works inductively from the solutions considered by identifying the myriad aspects of the problem they name; these are the barriers to change and improvement that need to be overcome. We also look at what insight, or design principle, underlies a given solution's success. This is a qualitative analysis. The method does not seek to assign specific impact or create comparative quantitative success. It looks for the types of representative solutions that have cropped up in a sector. The resulting map reveals where the greatest amount of effort is deployed in a system. Figure 1, an example from the tool's application to a later analysis of aquaculture, shows the outcomes of the process.

Once these three maps were drawn, we looked across them to identify areas of opportunity in the system, meaning places where not much activity resided but where the design principles might be useful. We arrived at eight opportunities that reflected a range of unexplored strategies that could potentially create leverage for change (Ashoka, 2009). At our recommendation, the foundation elected to dig deeper into the role of the middle of the supply chain. Out of the more than one hundred solutions we researched, not one reached out to distributors or processors. We theorized that this "black box" of the middle of the supply chain in the seafood industry would have some fruitful areas for exploration.

Next, we considered where to ground the anthropological research. Ethnography is often used in design process to gain insights into human behavior for the following reasons, according to Charley Scull, one of the anthropologists on the original team:

- It is a chance to see what people do, not just what they say they do. People are much better at showing you what they do than they are at telling you what they remember about what they do.

- Ethnography pairs well with design, because it is deeply observational and interpretive, but it is not solutions-oriented in its construction.
- It can provide a level of understanding that can help ensure that designs have contextual relevance.
- It is rigorous and representative, because although researchers talk to individuals, they are looking for cultural patterns that are indicative of *group* behavior and have implications beyond the particularistic.

In typical design work, there is only one user to consider, as the frame of the problem solving is at a granular level of the system (See Figure 2). In contrast, we were looking for insights about many groups of users across the system. What things could we observe that would give us an understanding of what to design for the whole system, rather than for one user? How could we pick the right users and scenarios to observe? The team struggled mightily with these questions. Ultimately we defaulted to my instincts from my first career as a journalist on how to discover the juiciest story: Find the conflict. We decided to pick the place in the supply chain where interests were most in tension: the sale. We set up eight site visits in four different countries to observe fish changing hands in the supply chain. The siting of those observational contexts proved to be prescient (and lucky). The work of Donella Meadows, environmental scientist and systems thought leader, reinforced that our choice of what to observe corresponded with her list of places to intervene in a system (Meadows, 1999) (Listed in order of increasing effectiveness):

- Constants, parameters, numbers
- Regulating negative feedback loops
- Driving positive feedback loops
- Material flows and nodes of material intersection
- Information flows
- Rules of the system (incentives, punishments, constraints)
- Distribution of power over the rules
- Goals of the system
- The mindset or paradigm out of which the system –its goals, power structure, rules, and culture– arises

Our observational choices put us in the middle of the key material flows of the fishing industry: the aggregation points of processing and distribution. It also exposed us to the critical information flows of the supply chain, tracking money and fish (See Figure 3). By narrowing our observation of "flows" to a specific transaction point, we were able to analyze what transpired in a potentially catalytic moment for the system. What kind of information was present or missing at the point of sale? What cultural and business values were present? What power dynamics were present? These exchanges (in this case, literal transactions as well as figurative ones) proved to be an observational goldmine, with broad implications for groups of users. By using ethnography in these specific microcosms of system behavior, we uncovered patterns of dysfunction in the system, as well as behaviors and beliefs that limited the ability to produce more sustainable outcomes.

Figure 1.

Figure 1. This map charts the solutions responding to the question, "How might we foster a business landscape where ecologically sound and innovative aquaculture can scale and thrive?" The solutions we chose identified the barriers to this end state, listed across the horizontal axis. The solutions identified the underlying design principles listed vertically. Each circle contains the number of solutions we found that address the barrier in that column with the intersecting design principle. Columns with few solutions often indicate the barriers that are hardest to address and require collective action to move. A row with many solutions indicates a particular design principle has gained significant traction, suggesting that it might be a useful one to use to guide creation of new solutions. Credit: *Breakthrough Aquaculture: Uncovering solutions that drive commercially viable models for farm-raised seafood* (Future of Fish 2014).

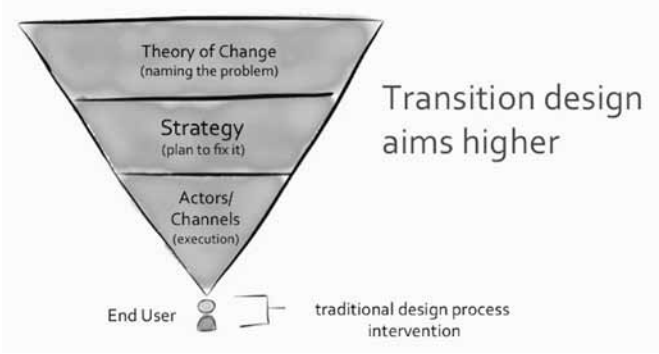

Figure 2.

Figure 2. Designing for a theory of change. Design process has traditionally been applied at the level of one user in a system. We attempted to apply it at the broadest level to augment a theory of change for system intervention. Credit: Dahle.

One of the most compelling observations we made in the field was at a U.S. fish processing facility with upwards of $100M in sales (See Figure 4). The ethnography team arrived at 5 a.m. to watch fish being sold. The sales manager sent out an Excel spreadsheet via email with the day's available fish to all of the sales reps, some of whom were in remote offices. All day, those reps sold against the static document without recording their sales in a centralized place. And they sold using the primary channel of fish sales –the phone.

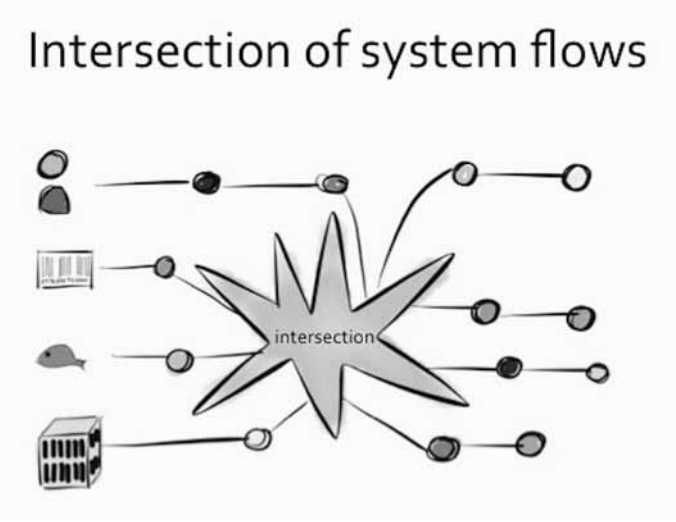

Figure 3. Crossroads. The observational moments we chose to include in our ethnography were intersections for multiple system flows: people, data, fish, and institutional influence. Credit: Dahle.

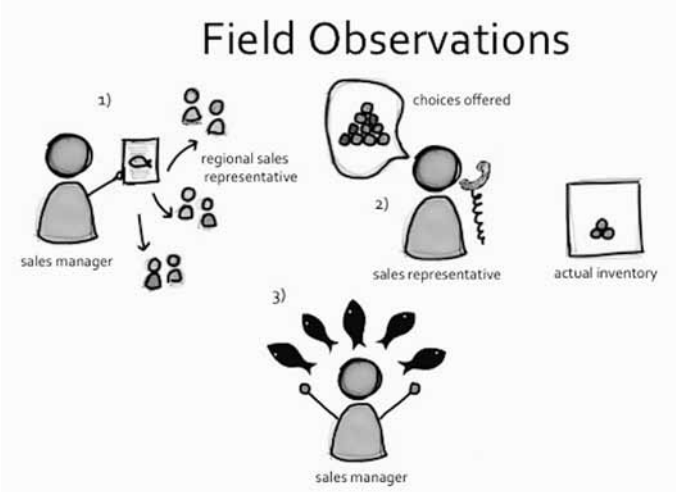

Figure 4. Ethnographic observations. We observed the sales manager hand off static sales tracking tools to the team (1). Sales staff sold against that static document all day, not recording dynamic sales. Inevitably, inventory did not match the sales closed (2). As a result, the sales manager called customers back and "negotiated" substitutions, obscuring the real reason for the scarcity. Credit: Dahle.

Predictably, at the end of the day, some categories of fish were oversold and others were undersold. Then the sales manager decided which customers got what they actually ordered and called back the ones who were picked for substitutions. Often, the conversation was full of white lies: "the truck broke down", "that supplier hasn't been reliable lately", "between you and me, that fish doesn't look as good as what I'd like to send out to you".

The manager would knock a little off the price, give the illusion to the slighted customer that they were a priority, and get permission to swap in a different fish. What we mostly witnessed was the benign version of a workaround. Less scrupulous middlemen simply take the skin off the fish and ship it with the label of the requested fish. Fish is such a complex product that even most chefs can't tell the difference once the skin is off (See Box "A Few Facts about Fish"). This mismatch of supply and demand is created by the gap between consistent, unadventurous consumer demand and variability and seasonality of a wild resource; what comes up in the net is somewhat unpredictable. But consumers (particularly in the United States) want the same five fish every day, according to the National Fisheries Institute. Middlemen (processors and distributors) are stuck trying to manage demand (the benign behavior we witnessed) or cheat their way around it. The high-touch transactions with the customers we witnessed made buyers feel well serviced, when, in fact, the purpose of the substitutions was to disguise scarcity. Of particular significance is the observation that to have the opportunity to use this "back door" for negotiation or fraud, a seafood company must have weak technology. Good tracking technology would easily illuminate that the books did not reconcile for "type of fish in" and "type of fish out." Our observations had illuminated a very problematic behavior in the system. If the hypothesis underlying the dominant theory of change was that pressure on retailers would "ripple" through the supply chain, here was a key player with significant business incentives to resist. That resistance was preventing the alignment of market incentives to the desired system outcome of more responsibly harvested fish. If fish move through the supply chain without being reliably paired with accurate information about catch method, species, and other key data elements, then the value of more responsible fisher behavior cannot earn a better price. When data is lost, all fish simply becomes a commodity and sustainability has no chance to create value and, in turn, drive behavior.

A FEW FACTS ABOUT FISH For those not familiar with the environmental crisis facing the world's fisheries, here are some facts to shape the context of our challenge:
- Ninety percent of the world's fisheries are overfished, or fished "at maximum capacity.
- We have lost 80 percent of our large predator fish, such as sharks and large tuna.
- Industry is enormously wasteful. More than 28 million metric tons (MT) of bycatch are caught and disposed of annually.
- The industry has a significant problem with fraud and mislabeling. About a third of all seafood is mislabeled. In the United States, if you buy red snapper, it is truly red snapper only 13 percent of the time. Mislabeling rates in sushi restaurants are upwards of 84 percent.
- Illegal fishing is a significant issue. Ninety-seven million MT of wild fish are landed annually. An additional 28–33 million MT of illegal fish is caught over and above the legal quotas. Illegal fishing is difficult to police in large part due to the terrible data tracking in the seafood supply chain. Most seafood is still landed and recorded using paper and pen. It's very easy to hide if you're already in the dark.
Sources: NOAA, Oceana, Fish and Agriculture Organization of the United Nations

The two strongest insights from the ethnographic work were the need for better supply chain traceability technology and the need to embrace the concept of fish with a story, or "storied fish" as opposed to "sustainable fish". At the time, less than 10 percent of fish globally was certified sustainable, and multiple competing definitions of sustainability from the nonprofit sector made finding responsible seafood difficult and confusing for both industry buyers and consumers. We posited that acclimating consumers to having any data at all about their fish, and using the information they cared about to appeal to them, would in turn put more pressure on companies to improve technology. Improved technology would reduce fraud and mislabeling, as well as making sneaking illegal fish into the legitimate supply chain more difficult.

How did these insights translate to actual change in the world? We had originally (and perhaps naively) predicted that once the new insights of the report were made public, existing nonprofits in the fish world would be eager to adapt their strategies. We also (naively) assumed that the foundation planned to tweak its existing theory of change based on the work. The reality was much more complicated. The ideas in the report, particularly our insistence that the middle of the chain was crucial to change efforts going forward and that technology was a pivotal solution, were met with reactions ranging from tepid enthusiasm to outright hostility. The founder of one of the most prominent and respected nonprofits working on retail partnerships in the seafood industry said that one could "take the entire middle of the chain and wad it up into a ball and throw it away and it wouldn't make any difference" to driving sustainability. When the program officer who had funded the work introduced our initial report to a crowd of fish nonprofit leaders at a conference, she equivocated, "Just because we funded this report doesn't mean we agree with it". The comment was not intended to undermine the work but to acknowledge that the process of adjusting a theory of change within a powerful foundation often involves a layered process of board sponsorship, executive buy-in, and extensive review at multiple levels. The radical shift in thinking we advocated would have required an engagement strategy on our part, which we had not considered or developed. All the same, the response in the room was not warm. The field of organizations was threatened by the disruptive insights and saw them as risky anomalies. The foundation was not ready to embrace the shift, which meant the report was essentially orphaned, with no one to implement the ideas inside it. We needed an intermediate step. We needed a pilot project to test the ideas we had delivered. I offered to do that and the foundation agreed.

So often, the ideas generated by beautiful design processes are never translated into the real world. They become missed opportunities. In this case, we didn't have the clarity we do now (after testing concepts in the field) about which of the insights or ideas was most important, so the report wasn't easy to explain or digest. The report landed as a collection of misfit toys with which no one was quite sure how to play. We also did not understand the dynamics of nonprofit clusters and the degree to which they are competitive with each other for funding. Disruptive ideas from the outside are often rejected; they represent capacities that existing organizations do not have and hence a potential shift away from funding their core competencies. Innovation threatens. I will circle back to those lessons and their implications in the last section of this article.

I launched Future of Fish as a nonprofit initiative in May of 2010, with seed grant funding from the Packard Foundation to explore and prototype the ideas in the report. Each round of funding was slightly longer than the last: three months became six months, became annual. In all, we received three years of funding from Packard. It took us roughly four years to be seen as a credible player in the nonprofit fish arena and to garner funding from other foundations. Much of that became possible only because I quit speaking publicly about systems change in fish contexts or about projects based on what was initially seen as an oddball, long-term strategy for change. I simply talked about project outcomes and impact and tried to do enough successful work that tracked to foundations' existing priorities and metrics, while trying to forward our lone agenda for better technology. The rest of the sector has now "caught up" to our theory on the importance of technology. The field has gone from virtually no funding supporting interventions to push technology in the seafood sector when we entered in 2010 to a steady and growing set of commitments from foundations. For example, the first recorded grant from the Gordon and Betty Moore Foundation in this area was in January 2014 to the Global Food Traceability Center. Future of Fish then landed its first technology grant from Moore as well in October of that year, according to the foundation's web site. In January of 2017 we became one of four organizations awarded a joint grant collaborating on efforts to educate and push traceability in the seafood industry, totaling $5M. Another multi-million-dollar collaboration is in the pipeline from USAID and others supporting the Seafood Alliance for Legality and Traceability (SALT), according to the collaboration's web site.

As is often the case with innovation in nonprofit sectors, smaller players (like Future of Fish) identify needs and larger organizations with more capacity adopt those ideas and scale with broader impact. The line between the work of the small organization and the systems-level changes is difficult to measure. We know Future of Fish contributed significantly. Would the whole sector have moved faster had Future of Fish been able to land the insights from our initial work in a more powerful, supported, and formal context of system shifting? At the time we did not know how to make the right case for that support. I am hopeful that the burgeoning field of Transition Design can help groom philanthropies and other stakeholders to embrace this kind of work in the future as a legitimate tool for developing theories of change and strategy.

In the next section, I'll explain what form our organization took and the strategies we've used to continually exert leverage in the system, without a formal endorsement. This is a reality in many settings –the change is driven by someone who has relatively little system power.

Not Exactly Incubation

Our first convening for Future of Fish in San Francisco was atypical in several ways. I chose a hotel with condo units that had multiple bedrooms, bathrooms and giant living rooms, and we met in one of the living rooms, sitting on the couches with a view overlooking Ghirardelli Square. Attendees had to share suites and get to know each other. The group was an eclectic but passionate collection of about a dozen innovators: a professional

chef, an executive from National Geographic, a technology marketer, a few fish processors and distributors, a few nonprofit leaders, and a First Nations fisherman from Alaska whose people had been fishing in the Cordova Valley for 3000 years. The one thing that all of the attendees had in common was what I call an "entrepreneurial mindset". Whether they worked in nonprofits or start-ups or big companies, they all had openness to new ideas, excitement about the possibility for change, and curiosity about each other's work. This attribute of entrepreneurial mindset has become a staple of our vetting process for participation in our design workshops.

Our initial report suggested multiple ideas for organizational interventions and argued that just one would not have the ability to effect systems change. Rather, we submitted that building a platform capable of supporting multiple interventions, like a machine that would continue producing solution after solution, was necessary. We used the word "incubator" in the report, which led to some misconceptions about what we were up to. We were incubating systems change, but most incubator models nurture organizations. They measure their success by the growth of their portfolio organizations, the amount of money invested, and the impact of those organizations. We were incubating disruptive ideas, which did not have the same measures. We selected a cohort of innovators and entrepreneurs (and intrapreneurs) in the seafood sector from our first workshop whose work supported our two levers of storied fish and traceability technology. Over time, we added multiple cohorts, all of which supported one of our two original leverage points. The purpose of the cohorts was three-fold. First, naming and supporting the group to network together raised the profile of their work and increased the chances that it would be noticed by media and other players in the sector. We began writing recommendations regularly for awards and fellowships for our cohort members as part of this effort. Second, the cohort gave them a community to support mutual progress and camaraderie. Even though some of the members technically competed, they had more in common with their fellow disruptors in their aims to change industry practices than they did with the business-as-usual players in industry. We were vigilant about ejecting cohort members who in any way violated the trust of the group, which led to a widespread perception that we worked with people of integrity. The support of the community and Future of Fish has been named to us many times informally as making the difference for entrepreneurs between giving up or pressing on. Third, we were able to provide strategic advice and business modeling for some members, as project fund availability allowed. Our model focused heavily on this third component during the first two years, until we realized how expensive and difficult that work can be and how narrow the success metrics are for funders who support incubators.

The emphasis on demonstration projects of disruptive ideas as a means to drive change was an intuitive one for me personally, having written about innovation and change management in business for years as a journalist. The concept seemed unfamiliar, too indirect, and too long of a lead-time for impact for many funders. Many said in early years that the projects we were supporting did not have the power, size, or influence to drive change. And yet, small interventions consistently spur big change. Professor F.W. Geels, at University of Manchester, put forward a theory of how society embraces socio-techno change, or shifts that require changes in both behavior and technology (2005). Geels (2005) and his

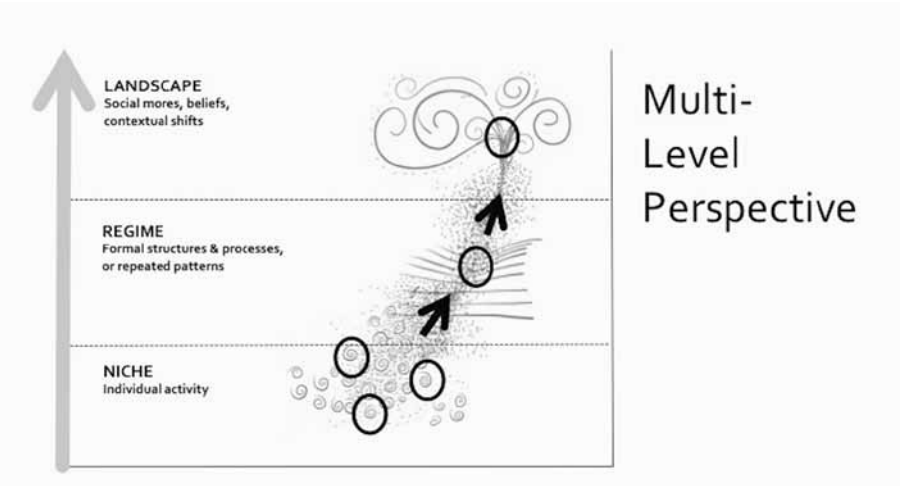

Figure 5. In this multi-level perspective, created by Geels et al. (2005), change percolates through layers in a system, often starting with disruptive activities that are outside the mainstream behaviors. As those take hold and prove to be more efficient, effective, or value creating, they begin to re-shape formal processes in a system, such as supply chain practices. In our case, we incubated seafood entrepreneurs whose use of story or technology was proving at a small scale to be beneficial or profitable for their companies. We also selected key individuals with platform, meaning access to distribution methods to share disruptive messages, either through business channels or media channels. Credit: Dahle, Geels.

colleagues theorized that change unfolds through a system as niche activities, like demonstration pilots and disruptive companies, find some traction, and begin to affect the formal processes that are part of a system, for example, business supply chains. Over time, the changes embraced in formal structures lead to changes in mindset and/or the broader social landscape and context. Our experience has borne out Geels' model (See Figure 5). Our cohort members were one set of "niche" activities that we incubated and amplified, through our technical assistance and message boosting. We also undertook select projects as an organization to bolster the public and business cases for traceability technology and storied fish. That work included publishing research reports, such as our 2015 report "Getting There from Here: A Guide to Seafood Traceability." The report was the first of its kind to name the specific business areas in which seafood companies could expect to add benefit or recoup costs from their traceability investments, as well as case studies from organizations that had experienced wins from implementing better technology. Additionally, we assisted cohort members with implementation of the projects they had designed while working with us. That role has often meant filling "gaps" in the skill sets and capacities in the field to execute. Our team's composition has fluctuated over time to provide a

range of services to the system, from storytelling and media creation to technological consulting to project management. Several of our current projects involve working in fisheries in developing nations where the state of the fishery necessitates a complex and holistic process that simultaneously considers the governance of the fishery, its data-gathering capacity, possible financing mechanisms, and government regulation all at once. Future of Fish has become, in essence, a general contractor that can assess the capacity and health of a fishery with respect to all of these dimensions and then recruit the partners necessary to work in collaboration. Most fisheries work has previously tried to work on one or two elements of this puzzle at a time and few nonprofits are able to position themselves as fluent in all of these areas with the networks and project management expertise to support the activity.

This approach of "filling the gaps" is a conscious emergent strategy on our part. As a result, we are a very fluid organization that is flexible and adept at navigating change. However, that fluidity also makes us hard to read for funders and colleagues. Most nonprofits settle into a specific set of activities and deepen their capacity. We have moved through phases of being entrepreneur coaches to technology analysts to project implementation experts. Through it all, we have developed a core set of skills around design process, which we use relentlessly in the field and in our work. We retain an anthropologist on our team and always look to integrate ethnography into our projects, which gives us empathy and tactical insights that other organizations do not gather. Essentially, we are constantly moving to the next behavioral stuck point in the system, though we are still nurturing seeds we planted in our first year of existence as well. The timeline for systemic change is long, far longer than the three-to-five-year result windows many foundations favor. Only now, seven years into our work, are some of our niche activities beginning to touch formal system processes and re-shape them.

Two of our strongest examples of niche work moving into the regime level are entrepreneurs Barton Seaver, a chef and sustainable seafood advocate, and Tom Kraft, a seafood industry entrepreneur.

We met Seaver in 2010 at our first gathering. We had interviewed him for the systems research we did for the first phase of the work and were impressed by his articulate passion for both fish and the communities of people who relied on marine economies for their livelihoods. Seaver had previously owned a restaurant in Washington, D.C., called Hook, which was renowned for its policy of buying fish locally and basing its menu on what came up in the net, not what a menu plan dictated. He tells a story of once receiving boxes of fish that he didn't order or even recognize, a small bony fish he'd never seen before. He called his supplier, who called the fisherman. The supplier then rang Seaver back to say that the fisherman had had a rough day out on the water and hadn't caught anything. Instead, he sent the bait, which turned out to be a small subspecies of flying fish, a difficult-to-filet specimen with little meat to it. Seaver gamely fileted 50 pounds of the fish and turned it into an appetizer. Importantly, he told his wait staff to share with diners the story of the fisherman's bad day and that the fish was bait –because sometimes that's what happens when we gather food from the unpredictable, wild ocean. He sold out of the dish in less than two hours at $26 a plate. Here was a master storyteller who could make people care about fish and the complex narrative behind its presence on a plate.

We set out to help Seaver build a business model for becoming a global chef advocate. Though he had been an Esquire Chef of the Year and National Geographic Fellow, he had no desire to become a celebrity and wanted the focus to be on the message, not his personality or charisma. In the beginning of our relationship, that meant loaning a project manager to Seaver while he went on his first cook book tour to help him optimize the press and exposure. Later, we helped him write proposals for partnerships and fellowships, positions that would elevate his expertise and leverage his culinary knowledge. He evolved into a sought-after consultant for recipe-development for packaged food companies, for sourcing advice for restaurants, and for messaging and branding advice for seafood companies. We secured a contract for him to build a video curriculum for restaurant chefs. We provided business modeling for multiple rounds of for-profit and nonprofit versions of scaling his work, some of which moved forward, while others did not. He landed a plum appointment at Harvard University's T.H. Chan School of Public Health as director of the Sustainable Seafood and Health Initiative at the Center for Health and the Global Environment. He's published seven books while working with us, six cookbooks and in November of 2017 a storytelling masterpiece about the history and community of domestic seafood called "American Seafood: Heritage, Culture and Cookery from Sea to Shining Sea" (Sterling Epicure, 2017). Our mission with Seaver has simply been to get his message into as many formats and forums as possible, scaling his storytelling by finding platforms where it can live without his personal presence or re-shaping business practices of those he touches. Our roadmap for Seaver came from the user typology we created in the original research. A common design process technique is to map the range of user mindsets related to the service or experience being designed. We weren't designing a single service or object, so we instead mapped mindsets of all users for the outcome we were trying to create: system change (See Figure 6). We noticed that the multiple users in the "catalyst" quadrant all shared the characteristic of possessing story. Whether that meant that, like Seaver, they were great storytellers, or that they collected data to shape a narrative, all of them had some information to share with the system producing overfishing that could potentially drive change. We also noticed that both the upper and lower quadrant players on the left side of the diagram had what we called "platform". As businesses, they had a network of connections and relationships, or their position in the supply chain meant they controlled a significant amount of distribution, of both product and data. We theorized that connecting these "catalysts" to other players with platform could be a path to scale that did not necessarily involve growing large companies.

We took a similar approach with Kraft. The founder of Norpac Fisheries Export, Kraft appeared on our radar in 2011. Kraft has an unusual pedigree for the seafood industry, which is dominated by family-owned businesses and people who've spent their whole careers in fish. Formerly an auditor for a large accounting firm, Kraft was long familiar with how business tracking systems worked in multiple industries. When he found himself running a fish distribution company in Hawaii, he realized that the industry's Wild West approach to tracking data and product was far from the norm in other sectors. As a businessman, he was frustrated by the difficulty that the lack of systems caused for managing his operations. In 2004, he started building his own technology system internally, suffering through all of the typical difficulties of pioneers of new business practices. In addition

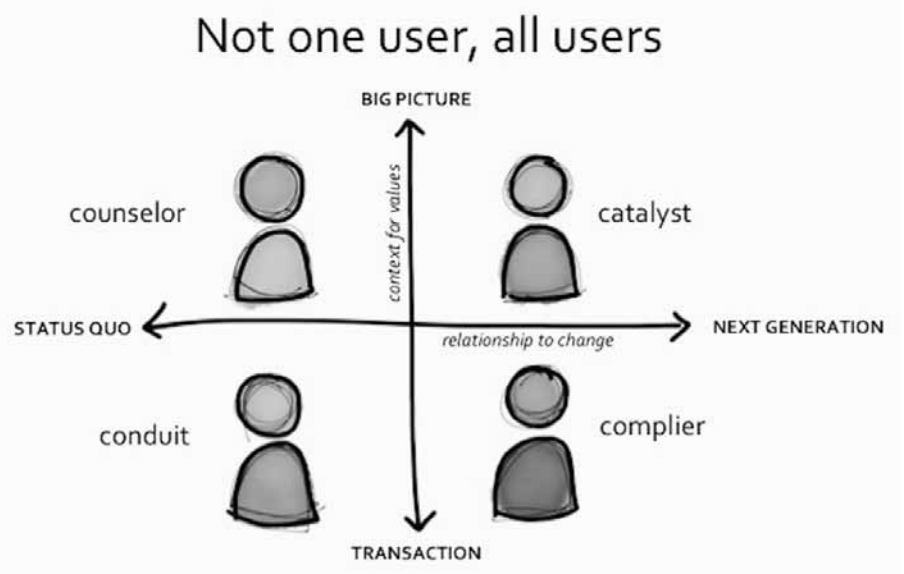

Figure 6. Typology of multiple users. This analysis depicts mindsets of multiple users of the system that produces overfishing toward change. We also noted in our research that catalysts possessed "story," meaning the storytelling skills or the information to make a persuasive case for change. Actors on the left side of the 2×2 had "platform," or the means to distribute information, product, or ideas to large networks. This analysis inspired our approach to helping catalysts build and connect to platform. Credit: Dahle.

to the software platform, he also had to design a new workflow for plant employees and integrate the bar code scanners and hardware that could mesh the physical activity and movement of the fish to the digital records generated. After Kraft joined our cohort, we paid for a supply chain data consulting team to assess the product he'd built for its market potential as a commercial product. The recommendation came back that he needed to do some significant overhauling of the code. We didn't have the money to support that project, nor was it investible as a skunkworks internal team initiative. Kraft kept plugging away and began to implement the tool with his supply chain partners once he had a new version of the tool. Today, that technology has become Insite Solution, one of a small number of technology tools designed for the seafood industry. The market for technology in the industry is still nascent, but Kraft has managed to become a leader in the field, winning a 2012 Seafood Champion Award for his efforts in promoting both sustainable fish harvesting and a new era of digital tracking.

How do we measure the impact of system catalysts like Seaver and Kraft? Seaver's media impression based on his prolific publishing, in magazines as his books, easily reaches into

the millions. Is that what's relevant? Maybe we measure the impact of the sustainability sourcing policies he's designed for campus and hospital dining services? For Kraft, how do we capture his influence in making a whole new market (technology for seafood) possible? How might we quantify his effect in socializing the traceability conversation with other industry executives at dozens of seafood conferences over the years? Measuring systems change, or even progress in realigning a complex system, is no easy feat. The metrics that work for simpler endeavors just don't apply. While Future of Fish does have versions of strategic plans with the key progress indicators that foundations invariably ask for in their reports, I've never been satisfied with the quantitative approach to measuring systems change. Figures 7 and 8 feature an initial framework of understanding for how one might map the journeys of system catalysts like Seaver and Kraft as their ideas (not their companies, necessarily) scale and begin to affect the top layer of Geel's multi-level model. In Figure 7, the left side of the diagram categorizes types of activities that correlate to potential impact in the corresponding layer on the right. Figure 8 maps some of the milestone for both Seaver and Kraft as their influence grew, with aid from Future of Fish's analogous amplifying activities. Figure 9 charts some of our amplifying activities, as well as influential developments or projects initiated by other system participants. To be clear, Seaver's and Kraft's successes have been driven by their own respective efforts and talents. Future of Fish has provided key assistance at critical inflection points, as well as some level of ongoing activity on behalf of "breaking a path" for their ideas to flourish. An unexpectedly powerful aspect of Future of Fish's work with these system catalysts has been simply to validate their work and provide personal support and encouragement when they inevitably hit difficult barriers. These entrepreneurs are the true heroes of systems change. Certainly easier, more fundable business models exist for behaviors for which robust markets are already developed. The market for data-free mystery fish flourishes. The market for story-free commodity fish is significant. The markets for nuanced storytelling about fish provenance and data-rich fish are still emerging. These tectonic shifts in markets take years to unfold, much longer than the typical three-to-five-year impact timelines that many foundations and investors demand. I am optimistic that as Transition Design coalesces as a field, we will begin to codify better frameworks and approaches to measurement that fully embrace and acknowledge the complexity of the work, as well as the patterns we are now seeing in how change unfolds in systems over time.

A New Kind of Designer

In the history of Future of Fish, we have used professional designers infrequently. The initial design team had several, but every round of innovation that we have generated since has come directly from system users (those affected by the problem of overfishing) or participants (players within the system who are trying to redirect it, such as nonprofit leaders, entrepreneurs, or civic leaders). We realized early on that the system that produces overfishing is so complex and tangled that no one designer could absorb enough context to come up with effective ideas. I also observed that designers functioning in the role of consultants are wont to prioritize ideas that are novel or clever over ones that have

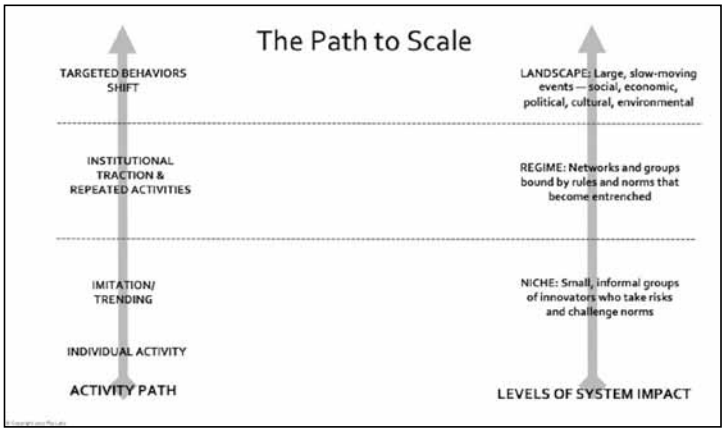

Figure 7. A framework for measurement. On the left are types of activities that might be measured to mark when a disruptive idea is transcending layers of Geel's multi-level analysis, pictured on the right. Elements of the MLA are from Geels (2005). Credit: Dahle, Geels.

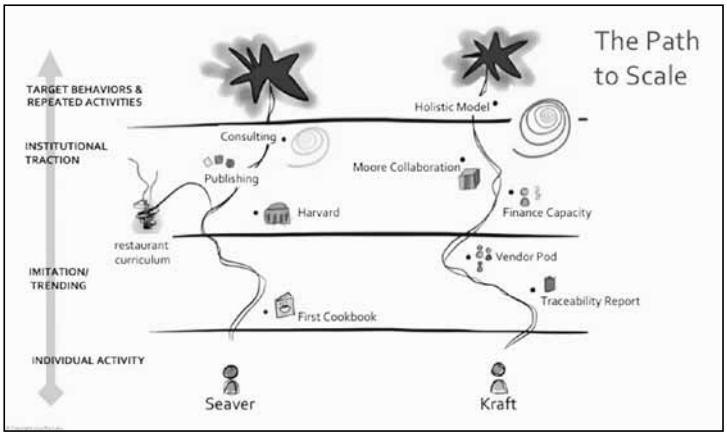

Figure 8. A path to scale. This framework tracks the disruptive ideas of two individuals in our Future of Fish cohort along the path to ascending the layers of the multi-level Analysis. Future of Fish or these cohort members initiated all of the projects listed. Credit: Dahle.

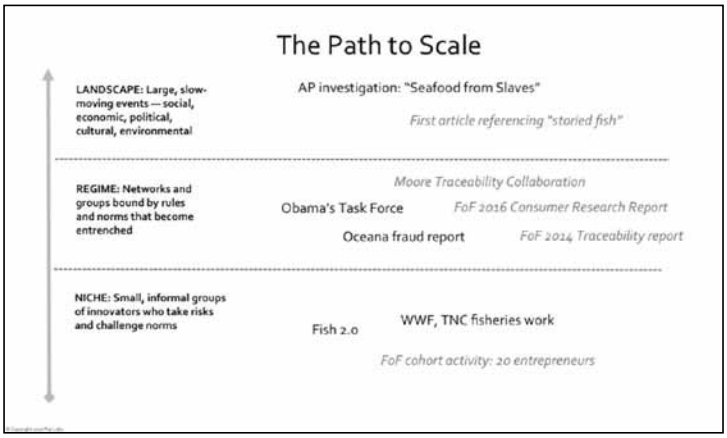

Figure 9. Amplifying activities. This chart tracks the work of Future of Fish, as well as other entities, that attempted to influence the trajectory of the disruptive ideas of "storied fish" and "traceability technology."

true potential for deep change. Sometimes, the most important breakthroughs come in pedestrian packages. Additionally, in Transition Design, there is no such thing as a clean slate. Any idea you might have, there is likely already a nonprofit or government program that has seeds of that concept, perhaps executed badly or grossly underfunded, but seeds nonetheless. The more effective and efficient path (but certainly the less flashy and creative one, from a traditional designer's point of view) is to work with the existing idea to make it better, not to build a perfect castle in the air that will never be built on the ground. The role for professional designers, then, is to become facilitators for others to design.

At the outset of Future of Fish, we began to think about the design process as a torch that is passed from us (the professional team of researchers and analysts) to the system participants (nonprofit leaders, entrepreneurs, visionary civic officials) and back. We center the system participants and the users they serve simply because they produce the best ideas and they are also the ones who have the skills, network, and commitment to execute them. As we learned from our own formative experience, nonprofits do not like to be told what to do by outsiders. Why not create a pathway that makes them an integral part of the design team? Multiple models and variations of this idea are emerging currently. At one extreme on the spectrum are programs and initiatives that aim to teach participants the design process and expect them to run all facets of it, including field research, either with some guidance at episodic meetings or entirely on their own using toolkits. At the other extreme is design consulting, which involves participants as educators to the designer, who invent the idea and hand it off to the sponsor organization to implement at the end. We've created a different division of responsibilities in which the professional team supports and services system participants while handling some of the tasks where expertise is critical (for example, field observation). Figure 10 illustrates our process. Anthropologists or researchers do all of the initial research and fieldwork. Then we convene a series of workshops with system participants and innovators whom we discovered in that research process, along with other expertise we know needs to be in the room. For example, when we convened a design workshop on building more oyster reefs, we included companies and nonprofits that have shell-recycling programs. Finance is an oft-missing capacity in social innovation brainstorms, so we ensure that knowledge is present. We also recruit "creative agitators," people who have solved problems in other disciplines or who bring artistic approaches to sense making, such as writers or actors. The goal is to create a process that gives these leaders both the permission to come up with new ideas and the typically missing expertise to flesh them out. After these workshops, we collaborate with participants remotely to draft their ideas into funding proposals, which we submit to foundations. Typically we work ahead of the design workshops to line up interested funders. Then we head into prototyping, with the project champions from the workshop receiving funds as well as support from Future of Fish to coordinate, facilitate, or recruit other team members as needed. Many other methods for social innovation, including social labs, put a much heavier responsibility on participants to self-organize and fundraise. Our method takes more investment from us as a project manager and convener, which we think pays off with more projects moving forward.

Funders do not often fund this whole process from start to finish. Our original cycle of the process was funded by one foundation. But as we repeated this co-design process,

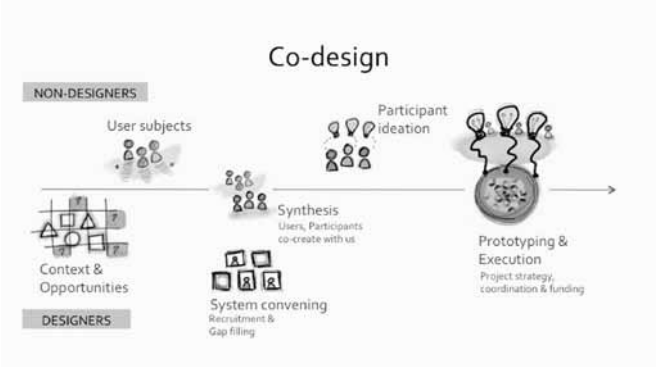

Figure 10. Co-design. Future of Fish's process for co-designing. Note the leadership of non-designers in roles that were traditionally reserved for designers.

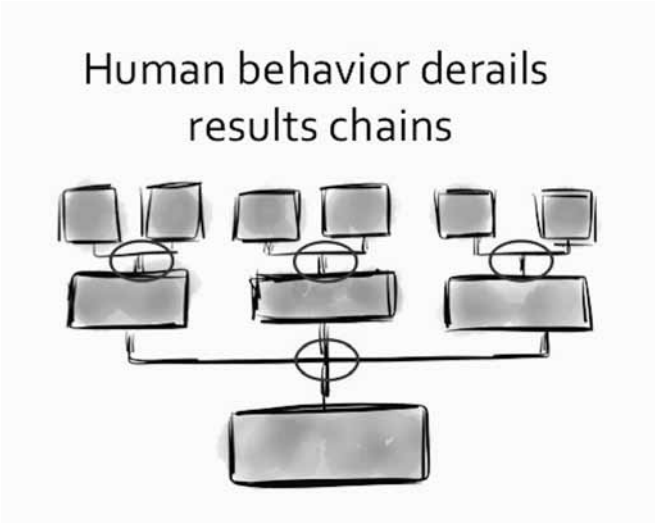

Figure 11. Potential of transition design. Each of the circled junctions are moments when an abstract mapping of cause and effect in a system can be derailed by stuck points of entrenched human behavior. Results-chain mapping does not account for a human-centered view of change. Using transition design can identify these stuck points and create new pathways for people in systems.

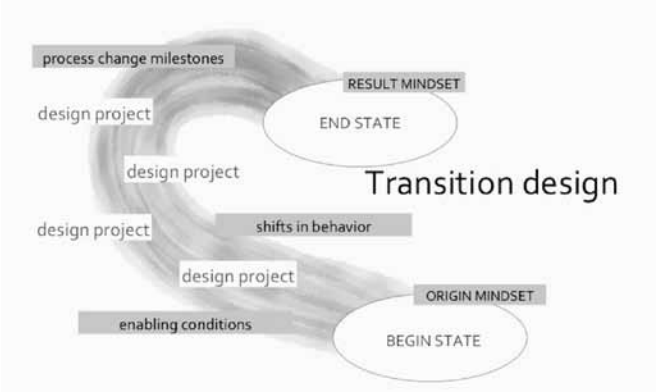

Figure 12. Multiple layers of design. In transition design as Future of Fish practiced it, we ran multiple design initiatives to address stuck points for multiple users to get to our desired end state of fish being valued.

taking on different slices of system challenges at each round, we found that breaking the process into three phases was easier to sell. Each phase –research, convening and piloting– produces specific deliverables that make the next phase more knowable. Funders like to have more certainty about what they are buying, rather than agreeing to the whole open-ended process up front. This is a cultural challenge for the world of philanthropy, whose myopic focus on outcome tables and deliverables often stifles the kind of innovation necessary to navigate complexity. The authors Kania, Kramer, and Russell (2014) call out the failure of foundations to distinguish between simple, complicated, and complex problems and pick the right tools to address them. Simple and complicated problems can mostly be addressed by straightforward, if difficult, sets of activities. They are linear and more predictable in their paths to solutions. Kania et al. (2014) give the example of building a hospital as a simple, though ambitious, challenge. A complicated problem would be developing a vaccine –a challenging process indeed, but with the right resources, one that produces known outcomes in a predictable timeline. These problems are appropriate for "strategic philanthropy", which invests in mapping theories of change, results-chains, and five-year execution path predictions, as Kania and his co-authors describe. But they argue that complex, systemic problems, ones for which no linear paths exist, must develop more emergent strategies.

> We have repeatedly felt a nagging suspicion that the conventional tools of strategic philanthropy just don't fit the realities of social change in a complex works. We have now come to the conclusion that if funders are to make greater progress in meeting society's urgent challenges, they must move beyond today's rigid and predictive model of strategy to a more nuanced model of emergent strategy that better aligns with the complex nature of social progress. (Kania et al., 2014, p. 26)

Transition Design should be in that new toolkit. Early on in our work, before Future of Fish was an initiative, a strategy consultant working with multiple foundations on sustainable fish asked for my feedback on a results-chain document that mapped the ideal flow of unfolding change in marine fisheries. He pushed across the desk a very tidy stacked-box illustration showed one improvement causing three more improvements, which triggered another six, etc. (See Figure 11). I drew circles with my red pen around each of the links between events and said, "The problem is that in between that event and the next outcome are many people who are very happy with the status quo and likely incentivized by current system conditions to keep doing exactly what they're doing. Why are they going to change behavior?" He didn't like that response for obvious reasons.

That is the very reason Transition Design can be so powerful: it is exactly the right lens to discover where human behavior is the barrier to change, and what to do about it. As Future of Fish, to the best of our ability, we have applied this method repeatedly, addressing different "stuck points" to the behavior changes we want to see, at multiple levels (See Figure 12). The reasons tuna fishers in Indonesia resist digitization are very different from the reasons middlemen in North America resist it. But we have mapped them both and have been able to suggest strategies to shift those behaviors. Transition Design can be applied

to any system in this manner, identifying major stuck points, as we did with the middle of the supply chain, and offering new ways to re-align the system.

Kania et al. (2014) conclude by suggesting the foundations try "co-creating strategy" with other actors in the system, including grantees. I would argue that a more bold and appropriate step would be to let the nonprofits, innovators, and users/beneficiaries themselves lead the design of the strategies. Like Future of Fish, foundations might provide the expert support these groups need to generate creative ideas and solutions using a Transition Design process. That idea leads to some interesting opportunities to shift not only the power dynamics of the complex problems we seek to solve but also the power dynamics of how we solve them. Transition Design could allow the voices of those closest to the problem –those experiencing it and those on the front lines of solving it– to have a stronger voice in deciding what solutions get created. That seems like an excellent starting point for creating a more sustainable and just world.

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Resumen: Casi 10 años de aplicar el *proceso de diseño* para terminar con la sobrepesca global, nos ha llevado a conocer de manera significativa los métodos para inventar, ejecutar e iterar una estrategia que impulse cambios generalizados en el comportamiento humano e industrial. El artículo cubrirá el uso del *proceso de diseño* para (a) postular una nueva teoría del cambio; (b) seleccionar e incubar puntajes de soluciones empresariales y participar en estrategias "amplificadas" de soporte para ayudar a que esas ideas disruptivas ganen tracción; y (c) los interesados *(stakeholders)* del centro del sistema se conviertan en los diseñadores de su propio futuro. El artículo sugiere nuevas formas de desarrollar el campo del Diseño para la Transición, incluidos los nuevos marcos de medición, y sostiene que el Diseño para la Transición es la herramienta perfecta para ayudar a la filantropía en la elaboración de las estrategias emergentes necesarias para abordar problemas complejos.

Palabras clave: Diseño - pesquerías - sistemas - teoría del cambio - partes interesadas - sobrepesca - filantropía - diversidad.

Resumo: Quase dez anos de aplicar o processo de design para terminar com a sobrepesca global, levou a conhecer de modo significativo os métodos para inventar, executar e iterar uma estratégia que impulse mudanças generalizadas no comportamento humano e industrial. O artigo aborda o uso do processo de design para a) postular uma nova teoria da mudança; b) selecionar e incubar pontuações de soluções empresariais e participar em estratégias amplificadas de suporte para ajudar a que essas ideias perturbadoras ganhem tração; e c) os interessados (*stakeholders)* do centro do sistema se convertam nos designers de seu próprio futuro. O artigo sugere novas formas de desenvolver o campo do Design para a Transição, incluídos os novos marcos de medição, e sustenta que o Design para a Transição é a ferramenta perfeita para ajudar a filantropia na elaboração das estratégias emergentes para abordar problemas complexos.

Palavras chave: Design - pescarias - sistemas - teoria da mudança - partes interessadas - sobrepesca - filantropia - diversidade.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Transition Design: Teaching and Learning

Stacie Rohrbach * and Molly Steenson **

Abstract: Central to the development of Transition Design is its foundation in higher education. The theoretical basis that informs the practice of Transition Design develops from an emergent process comprised of hypotheses, theory, and testing in educational settings. These approaches –which focus on tackling specific, complex, placed-based challenges– must be tailored to address the nature of specific contexts and the varied learning of student cohorts and their respective needs. This paper argues the importance and thoughtful integration of Transition Design into design education and introduces curricula for undergraduate and doctoral design students. It outlines methods and tools that are utilized in our teaching, describes successes, identifies challenges, presents ideas for improvement, and proposes opportunities for development.

Key words: Transition Design - education - curricula - teaching - learning - theory - practice.

[Abstracts in spanish and portuguese at pages 262-263]

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Central to the development of Transition Design is its foundation in higher education. The theoretical basis that informs the practice of Transition Design developed from an emergent process comprised of hypotheses, theory, and testing in educational settings. These approaches –which focus on tackling specific, complex, placed-based challenges– must be tailored to address the nature of specific contexts and the varied prior learning of student cohorts and their respective needs. This paper argues the importance and thoughtful integration of Transition Design into design education and introduces curricula for undergraduate and doctoral design students. It outlines methods and tools that are utilized in our teaching, describes successes, identifies challenges, presents ideas for improvement, and proposes opportunities for development.

The kinds of thorny problems that Transition Design can address are all around us. They fall under the category of "wicked problems" that appear insurmountable because of their scale –poverty, incarceration, climate change, affordable housing, and gentrification, to name a few– whereas a tame problem can be solved easily by gathering the right information and plugging it into the problem. A wicked problem, on the other hand, can't be formulated in that manner because each one is a symptom of another problem. For example, as we write this article, a succession of hurricanes have hit several areas of the southern United States and Puerto Rico. Climate change is a contributing factor to the strength of these storms. Nonetheless, geographical, global, local, and political factors also play a role in the intensification of storms. Where do we begin to tackle the problem? Whatever we choose will be the symptom of another problem. For another example, the problems of high school completion rates, child poverty, incarceration, and affordable housing are all interconnected issues in a Pittsburgh African-American neighborhood. Where we attempt to intervene at the outset will have an impact on every other part of the equation. Indeed, the way that a wicked problem is defined "determines the nature of the problem's resolution" (Rittel & Webber, 1973, p. 166).

In Transition Design, we acknowledge Rittel and Webber's argument that wicked problems are too complex to solve in the way that one approaches a "tame problem". Per their 1973 paper, "The formulation of a wicked problem *is* the problem! The process of formulating the problem and of conceiving a solution (or re-solution) are identical, since every specification of the problem is a specification of the direction in which a treatment is considered" (Rittel & Webber, p. 161). There's no end, nor is there an "immediate and ultimate test of a solution" and "every solution… is a symptom of another problem" (p. 165). Also important in Transition Design education is the notion of "cosmopolitan localism" (Manzini, 2005), which situates itself in place-based practice that is nonetheless global in its exchange of information. We thus situate our teaching of Transition Design in contexts that are familiar to our students –where they live, study, and work– while encouraging them to consider the global ramifications of their actions.

As faculty members in the School of Design at Carnegie Mellon, we believe it is important to integrate Transition Design education into all levels of the curriculum and we have begun to heed this challenge. Our approaches to teaching a diverse body of students share a commitment to teaching them about the necessity of societal, systems-level change to address complex problems, the value of imagining and realizing sustainable futures, and the roles of designers in these processes. We present two vignettes in this article from

either end of the spectrum that chronicle the lessons we are learning in teaching Transition Design. In particular, we will highlight the specificities of bringing Transition Design teaching and learning to bear at the undergraduate and at the doctoral levels. Above all, we want to emphasize that for us, as educators, Transition Design is a learning process, in which its curricular development and delivery furthers our inquiry and discovery.

Part I: Teaching Transition Design in the Context of a Fourth-Year Undergraduate Design Research Studio

Following two years of teaching Transition Design as a seminar in the graduate and doctoral programs in the School of Design where outcomes indicated its value, the faculty decided to integrate relevant content into an undergraduate senior design research studio that is currently being taught throughout the fall 2017 term. The planning, delivery, reflection, and revision of course activities illustrates the symbiotic relationship between teaching, research, and practice. Included is an overview of course themes that highlight methods and tools utilized, the successes of our approach that we've identified to date, challenges that have emerged in teaching Transition Design in the context of a senior design research studio, and our ideas for improvement.

Overview of Course Methods and Tools

In the context of a three-hour studio course that convenes twice a week over a 15-week period, Associate Professors Stacie Rohrbach and Stuart Candy and Professor and Head of School Terry Irwin introduced 48 undergraduate design students to Transition Design theories and methods to foster long-term design thinking; the implications of current practices warrant careful consideration. Lectures, discussions, and activities served as a basis for grounding interventions designed for service and social innovation. At the onset of the course, students were introduced to wicked problems that exist throughout the Pittsburgh, Pennsylvania, area where they live and study. Configured into eight teams of six students, the cohort spent several weeks investigating issues that contribute to the lack of affordable housing and public transportation, gentrification, poor access to quality education and food, crime, and poor air and water quality in the region. In an attempt to move students through a series of steps that we identified as critical to the understanding of Transition Design, we utilized a range of methods and tools as outlined below.

Framing Wicked Problems

Diagramming root causes and consequences of place-based issues. The entry-point for the course focused on wicked problems that warranted systems-level change to address them effectively. Rooted in Transition Design, the course stressed the importance of tackling wicked problem because if they are left unaddressed, they may lead socio-technical systems in harmful directions. Students were shown familiar and foreign visual examples of various problems that related to each of their topics as a means of aiding the breadth and

depth of their thinking at various levels of skill. The introductory lecture and discussion sought to help students gain insight into the characteristics, situatedness, and interconnectedness of wicked problems within the context of larger systems.
While gathering information on the topic assigned to their team, students were challenged to visualize the existing problems and outcomes that they discovered. Each team was given a printed panel on which to place their discoveries. The sheet included a diagramming framework that called for students to place their findings into high-level categories that are commonly used to delineate the root causes of wicked problems. The categories include social, technological, economical, environmental, and political (STEEP) issues (See Figure 1). The students were also tasked with identifying the root causes of issues and the consequences of current actions. To aid their thinking, the students learned about leverage points, which Donella Meadows describes as "places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything" (1999).

Mapping Stakeholder Relations

Uncovering the fears/concerns, hopes/aspirations, and connectedness of stakeholders. The second stage of the course focused on worldview, which is characterized as the understanding of reality that people create based on their interpretation of prior experiences (Capra, 1983). People's worldviews describe and predict reality and thus shape how they perceive and engage in the world. Instead of continuing the mechanistic worldview that is common in Western culture and which exasperates capitalistic tendencies, the studio course described the value of a holistic worldview in tackling systems-level challenges (Capra, 1997). This change functions as a paradigm shift, which enables people to look at things in a new way. A few characteristics of this shift in perspective include relating instead of dominating, cooperating rather than competing, co-learning and re-skilling, and designing for long time horizons (Woodhouse, 1996). Holistic thinking encourages a speculative posture through which students are curious, pose questions, and emphasize relationships rather than simply aiming to solve problems and focusing on objects. In addition, a mindset that values waiting and observing is a critical component of this approach.
Any worldview causes people to believe what they see rather than identify their perceptions as pieces of reality. As a result, worldviews typically reinforce existing beliefs and expectations. Thus, the course called for students to define and investigate stakeholders related to their topics. Although the students didn't have access to specific stakeholders, we asked them to use the information they gathered to speculate on the fears and concerns and hopes and aspirations of those groups (See Figure 2). Each team chose three stakeholder groups related to their topic that represented a diverse set. They then performed triad mapping, which revealed points of affinity and opposition among the groups and the nature of the relationships among the groups (See Figure 3).

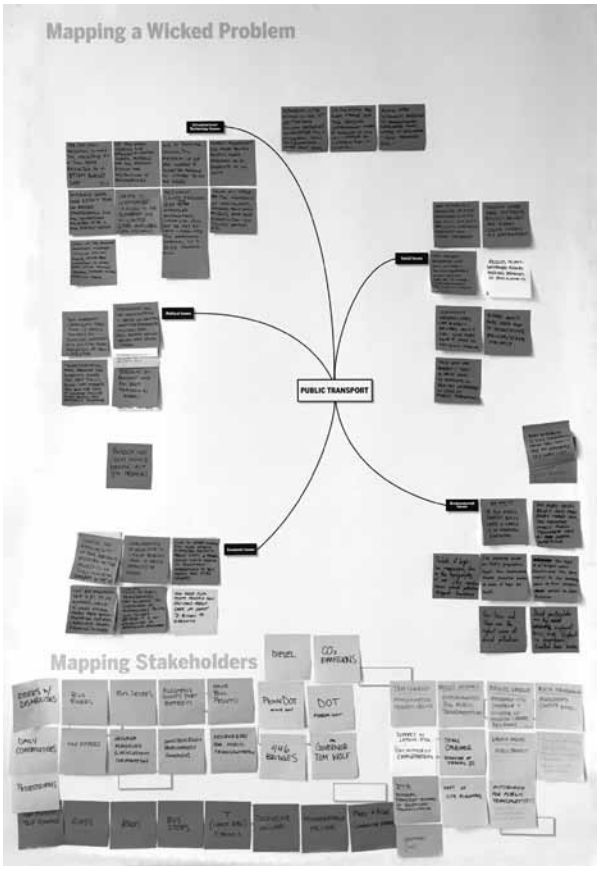


Figure 1.

Figure 1. Students used social, technological, economical, environmental, and political categories to delineate the root causes of transportation problems in Pittsburgh.
Figure 2. Students described the fears/concerns and hopes/aspirations of air quality stakeholders in Pittsburgh.

Figure 2.

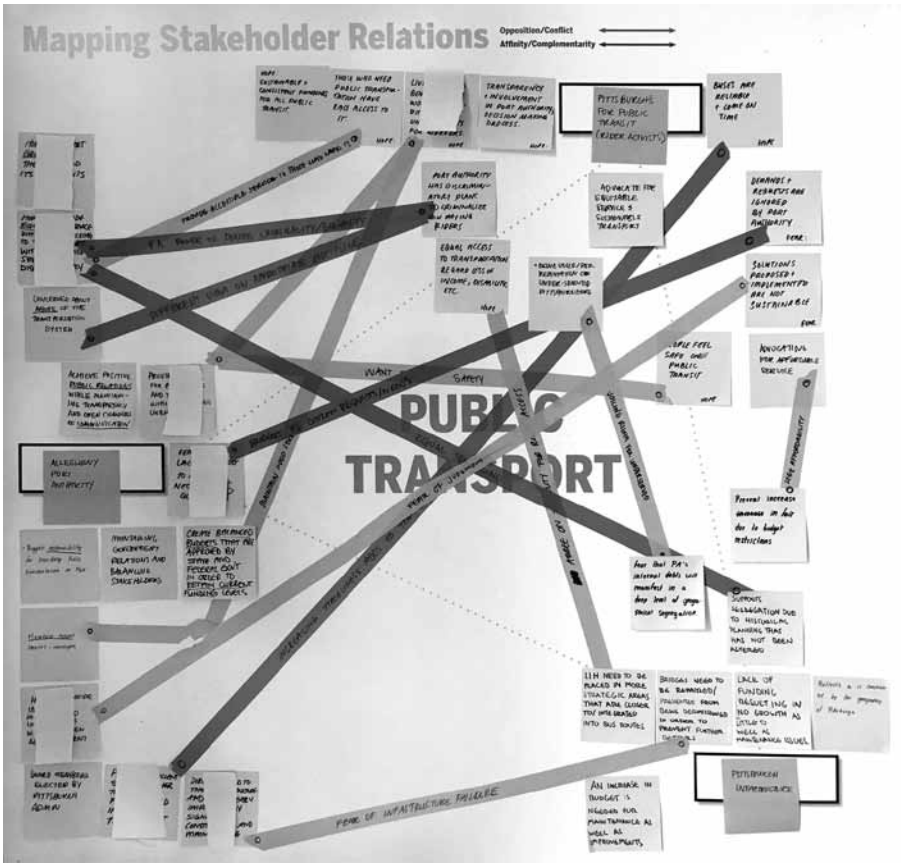


Figure 3. Students performed triad mapping, which revealed points of affinity and opposition among stakeholder groups, and the nature of their relationships.

Developing Visions

Defining short-, medium-, and long-term futures. Once the students had gained a fair understanding of the challenges that they faced at various levels of scale and started to consider the many stakeholder groups involved, the studio shifted their attention to speculating on futures as a means of exploring diverse ways of sense making. Note that 'futures' is plural because, in contrast to the past, which is singularly defined, futures do not yet exist and thus can take many different paths. Informed by a method in course instructor Stuart Candy's dissertation (2010), students conducted an exercise that aided their development of possible, probable, and preferable futures. Relative to the full set of topics, they brainstormed what could happen, what was likely to happen, and what they preferred to happen. To aid their thinking, students were provided with a template to frame the definitions of their futures in relation to social (S), technological (T), economical (Ec), Environmental (En), and Political (P) concerns. In addition to the STEEP framework, the eight teams were combined into four pairs and provided with a lens through which to view their futures. The lenses included growth (progress has continued), collapse (society has come apart), discipline (order is coordinated or imposed), and transform (a profound historical evolution occurred). After generating characteristics of Pittsburgh in 2050, the students developed written scenarios that served as a hypothetical history (See Figure 4). In subsequent class sessions, students were encouraged to drill down through levels of scale to explore their futures in greater granularity and think more deeply about the scenarios they developed. Focusing specifically on their topics, the student teams collaboratively created a vision for the year 2050 in which the current problem they had been studying no longer exists. In this exercise, students were urged to consider granular aspects of the situation. Once again, the students developed a written story to convey their thinking. A few teams also visualized designed objects and services that existed in their vision of 2050 as a means of clarifying their ideas and aiding their writing (See Figure 5). Next, students were introduced to "Seeing in Multiple Horizons: Connecting Futures to Strategy" (Curry & Hodgson, 2008), which aims to assist students in their thinking of short-, medium-, and long-term change. The framework also strives to facilitate "cultural transformation and aid innovative exploration and wise action in the face of uncertainty and not-knowing" (Wahl, 2017). The framework consists of three horizon lines that move from present day to a future time. One horizon sustains innovation as the status quo. A second horizon disrupts the systems and changes what is possible. A third horizon involves a transformation that moves the system towards a regenerative culture. Wahl (2017) explains, "Three Horizons thinking offers a methodology and practice of seeing things from multiple perspectives and valuing the contribution that each perspective makes to the way we bring forth the world together" (p. 1). The students used the three horizons to define milestones along a timeline that led to the vision they defined. They described the milestones that occurred over a thirty-year period of time using text and images. Their speculations served as the first steps in defining design opportunities that are situated within larger systems (See Figures 6 and 7).

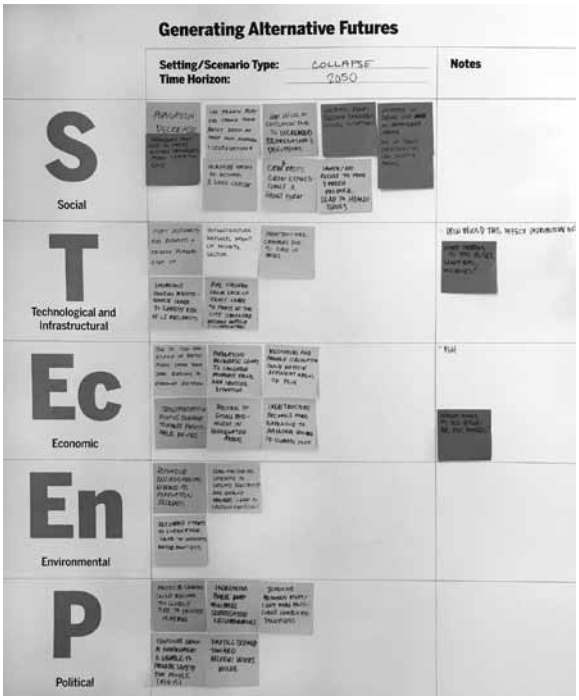


Figure 4. Students explored alternative futures by mapping social, technological, economic, environmental, and political issues through grow, collapse, discipline, and transform lenses.

Figure 5. Students visualized designed objects and services that existed in their vision of 2050 as a means of clarifying their ideas and aiding their writing.

Figure 4.

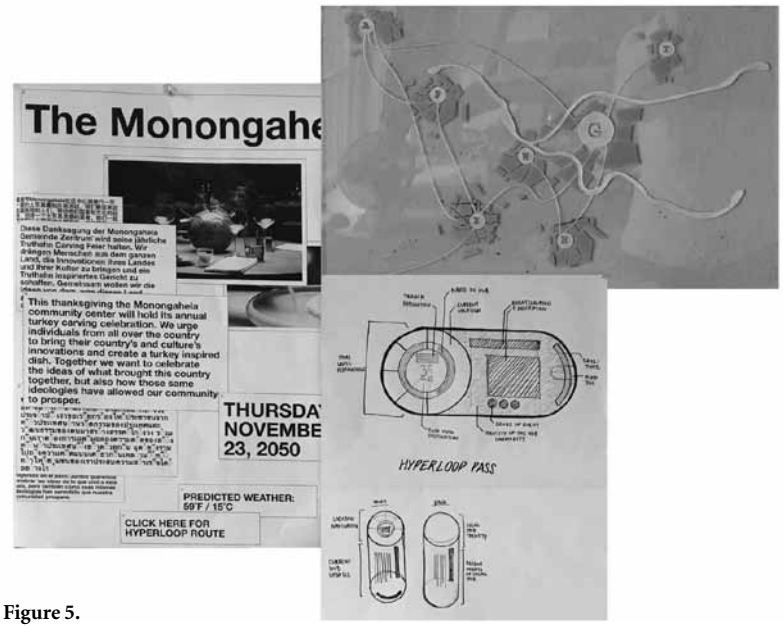
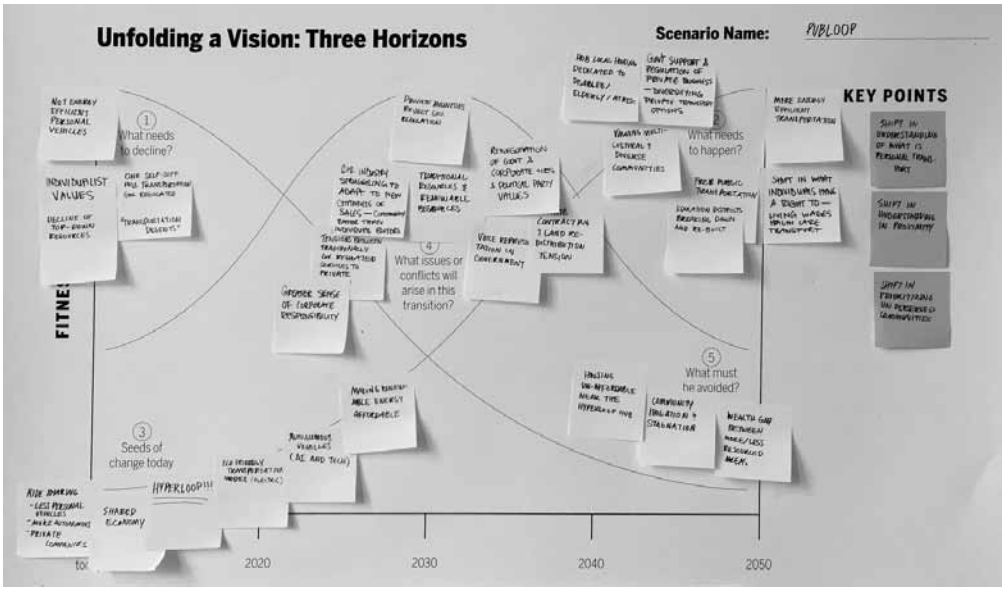


Figure 5.



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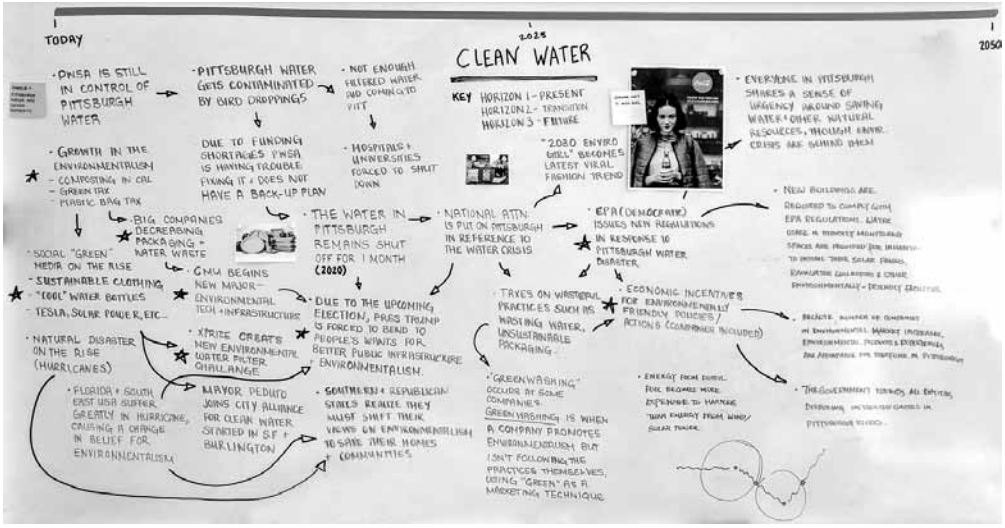

Figure 7

Figure 7. Students used the three horizons to define milestones along a timeline that led to the vision they defined.
Figure 6. Students used the three horizons framework to see their ideas from multiple perspectives and identify the value of each contribution.

Exploring Theories of Change

Describing the satisfaction of human needs through design. Given that the course focused on teaching approaches that aid students' thoughtful design of products, communications, and environments, we discussed human needs as guiding this process. Chilean development economist Manfred Max-Neef (1991) published a taxonomy that proposes a theory for the classification of human needs. He argues that circumstances cause people to take action in response to a fundamental need and that people are motivated by the same set of nine needs –subsistence, protection, affection, understanding, participation, idleness, creation, identity, and freedom– but the ways in which they satisfy them are unique and infinite. For example, in order to satisfy a need for subsistence, people may be motivated to get something to eat. It is important to note that not all satisfiers address needs in a sustainable manner. Some satisfiers address a single need, stimulate a false sense of satisfying, and/or inhibit satisfaction or destroy the possibility of satisfaction. Students used Max-Neef's taxonomy as a tool for studying how the design of existing products, communications, environments, and services satisfies or inhibits fundamental human needs. They defined and explored a design piece that they interact with often and another that they believed included few or no inhibiting satisfiers (See Figures 8, 9, and 10). The class discussion that followed illustrated the difficulty in finding something that had been designed by humans that was void of inhibiting satisfiers.

Having defined aligned futures that exist along a timeline and investigated human needs, the students were poised to consider the role that lifestyles play in setting the context for an exploration of design interventions. They turned their attention to everyday life, as examining people's actions provides insight into how they satisfy their fundamental human needs. Students were asked to think about the level of control that communities retain in satisfying their needs in the past and in the present day. They learned that as centralized institutions such as government, corporations, media, and police increase their control of satisfying human needs, life becomes more homogenous, fragmented, and lifeless. This transfer of control can cause ecological, social, economic, and political problems as the function and structure of everyday life is altered (Kossoff, Tonkinwise, & Irwin, 2015). In order to regain control of satisfying human needs, students were encouraged to consider the benefits of cosmopolitan localism, where communities are human-scaled and place-based in their activities yet exchange information globally (Irwin, 2015). Students examined everyday life at various levels of scale as a means of understanding the nestedness of community relationships, helping them to grasp a larger vision of what sustainable communities in Pittsburgh might look like.

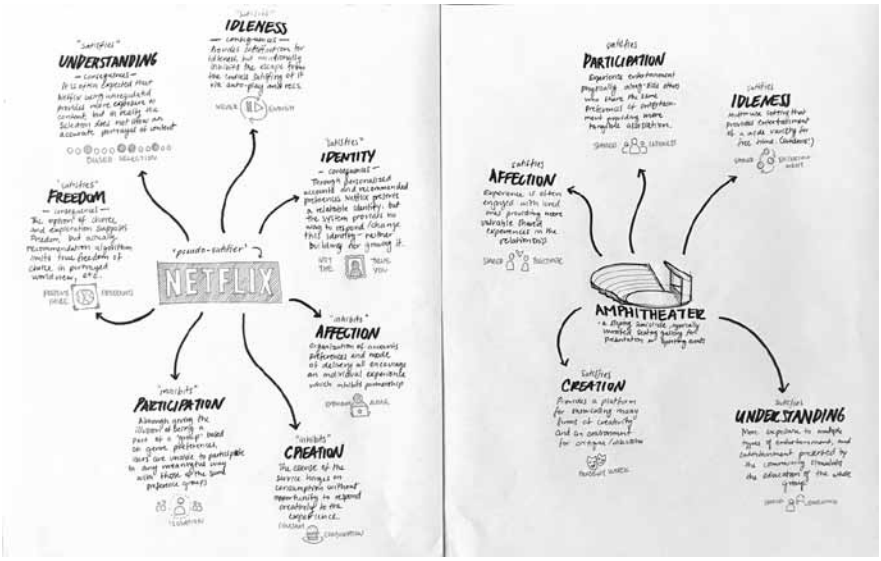

Figure 8.

Figure 9.

Figure 8. Students investigated designed communications, products, environments, and services, learning how they satisfy or inhibit the satisfaction of human needs. **Figure 9.** Students investigated designed communications, products, environments, and services, learning how they satisfy or inhibit the satisfaction of human needs.

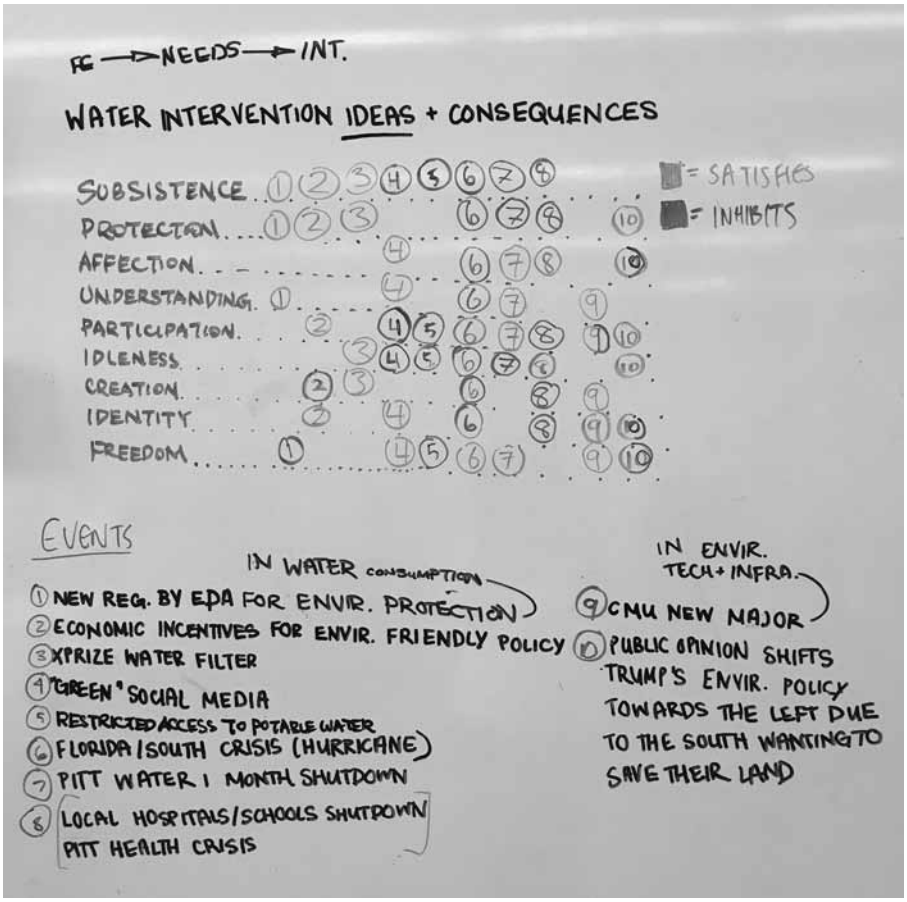

Figure 10. Students reviewed their ideas for possible design interventions, identifying how they satisfy or inhibit the satisfaction of human needs.

Defining Design Interventions

Proposing opportunities for design to seed and catalyze systems-level change. In an effort to help students build on the Transition Design work that they conducted, and aid their realization of design opportunities for intervening in Pittsburgh systems in appropriate and effective ways, we introduced them to service design and design for social innovation concepts. The students gained an understanding of the characteristics that define these areas of design focus and learned fundamental approaches that enable their practice.

Relative to service design, the students explored the value of fostering relationships between customers and service providers to improve the quality of their interactions and the service that is rendered. Associate Professor Molly Wright Steenson, who holds expertise in service design, led a session in music sharing. They quickly brainstormed service scenarios and prototyped concepts for presentation to the class. This fast-paced activity, a microscopic version of the Global Service Jam (Thomas & Leber, 2016), encouraged students to utilize the design skills they had learned and acquired over the past three years of their undergraduate design studies (See Figure 11).

Throughout the following week, students dove into design for social innovation under the advisement of Cheryl Dahle, CEO of Flip Labs and a distinguished Adjunct of Professional Practice in the School of Design at Carnegie Mellon. She referred to the article "Rediscovering Social Innovation" in defining the key tenets of design for social innovation as "a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals" (Phills, Jr., Deiglmeier, & Miller, 2008), and she introduced students to a range of relevant businesses, services, and products, such as fair trade and a human-powered washing machine. We framed such social innovation interventions as components of Transition Design because collectively, they can lead to longer-term systems change. After the class took students through a social innovation case study that focused on the fisheries in Indonesia and highlighted important characteristics and considerations of the situation, Dahle showed students a four-quadrant framework aimed at helping them define the projected outcomes of intervention proposals. One axis focused on the scale of impact, while the other mapped the complexity of the concept. The students then used the social design pathways to "see that broad terrain; to identify the skills required for action; to identify the kinds of partners needed for success; to preview the scales of engagement; and to foresee the possible impacts of social design projects" (2017). In this framework, one axis focused on the scale of engagement while the other asked students to consider the range of expertise of parties involved (See Figure 12).

Once the students had brainstormed design interventions through service design and design for social innovation lenses (See Figure 13) that aligned with the futures timelines they created, they conducted an exercise that is currently leading them to take action on their thinking and bring an intervention to fruition. First, each student team chose six intervention ideas to pursue. Next, every student committed to an interest in carrying a few of the interventions further during the remainder of the term, assigning to them learning goals in conducting each study. Having defined their objectives, the teams mapped possible connections between their intervention ideas and the other topics being investigated by their classmates. This step illuminated the nestedness of class topics and opened doors for collaboration among the cohort. As a result, the class cohort reconfigured itself into new teams that included three or four members whose research during the first half of the term and design skills poised them to tackle their chosen intervention. The new teams then defined existing obstacles and proposed ways of addressing them with the resources they had at hand. Throughout the next six weeks, the student teams developed their interventions as hypotheses that they could use to receive school-wide feedback at the close of the term (See Figure 14).

Figure 11. Students quickly brainstormed service scenarios and prototyped concepts for presentation to the class.

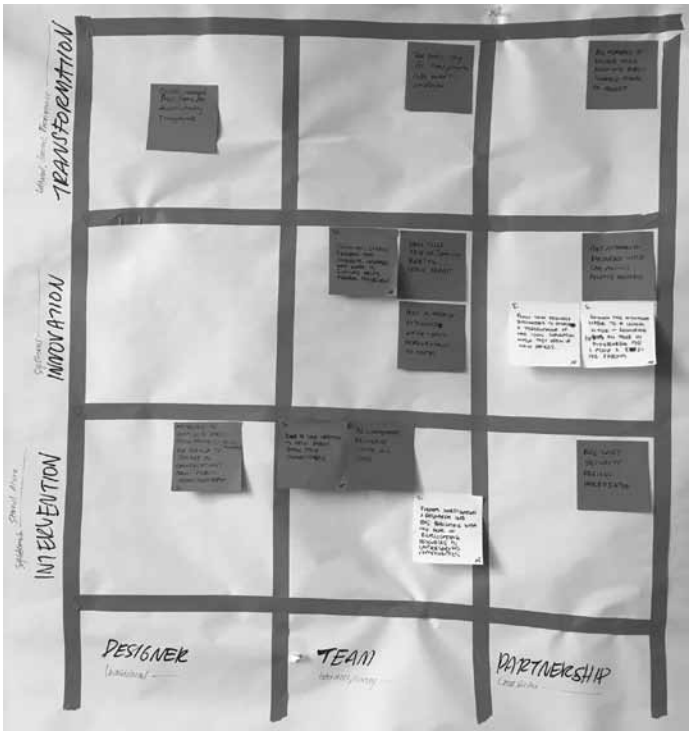

Figure 12. Students used the social design pathways framework to foresee the possible impacts of their intervention ideas, identify scales of engagement, and propose partners.

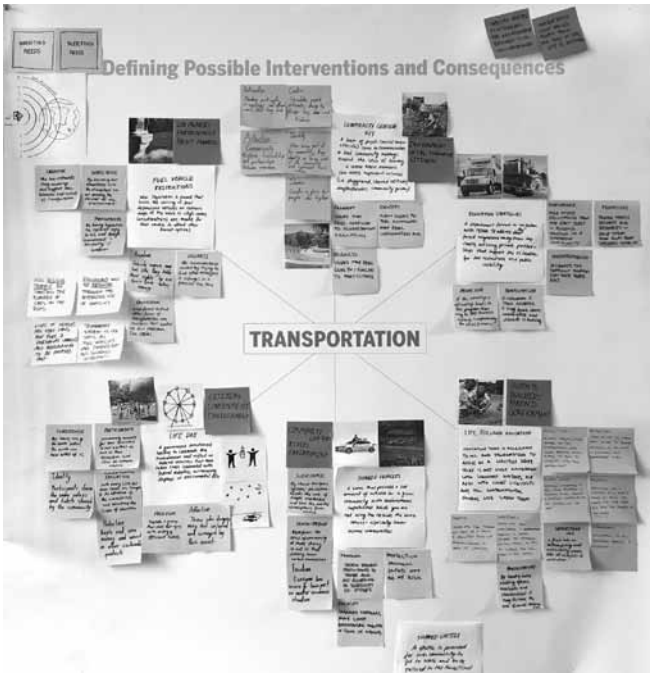

Figure 13. Students mapped their service design and design for social innovation intervention ideas that they believe have significant merit, in concert.

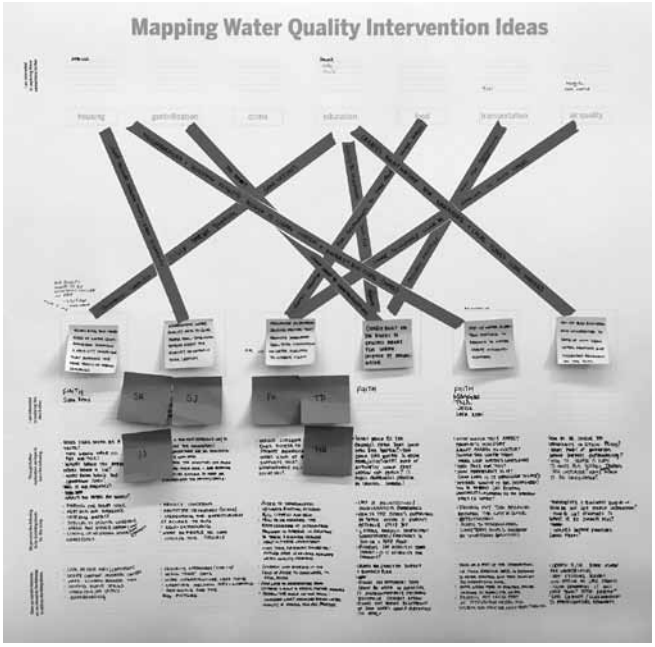

Figure 14. Students teams mapped possible connections between their intervention ideas and the other topics being investigated by their classmates, articulated research questions, and proposed plans for working through known obstacles.

Successes

Despite common challenges that arise when developing and delivering a new course, we were pleased to see the students' incremental growth throughout the term. Our interactions with them highlighted successes in our approach to teaching Transition Design in the context of the design research studio –some of which were aspirational, while others were unanticipated.

Students grasped the facets of wicked problems and explored how to enter them. Understanding that wicked problems are systems problems that reside within other systems enabled students to shift their thinking from solving small-scale, immediate problems to seeing relationships among their topics at various levels of scale. By working through a series of exercises, students illustrated a confidence in defining and tackling manageable facets of wicked problems rather than simply becoming overwhelmed and paralyzed by their magnitude. They also learned to distinguish consequences of wicked problems by tracing their root causes up through levels of the systems. Starting the course with systems-thinking discussions and activities led students to alter their views of local challenges and appropriate ways of intervening. A quote popularly attributed to Albert Einstein states, "No problem can be solved by the same kind of thinking that created it". Given that systems are so ubiquitous that they often go unnoticed, the curriculum helped students to identify nested systems, as gaining the skills to define them is critical to the study and practice of Transition Design.

Students recognized the importance of stakeholders in the Transition Design process. Although this task proved to be difficult, the students began to indicate awareness of the connectedness of their topics and stakeholders, an appreciation for the complexity of the challenges they studied, and a cognizance of how little they knew about their stakeholder groups. Course activities caused the students to recognize pitfalls in stereotyping stakeholders and the importance of working directly with stakeholder groups. As the semester transpired, the students also expressed a deep appreciation for the research that their peers had conducted on adjacent topics.

Students created visions of futures that informed their design actions in the present. After participating in several sessions that focused on envisioning futures, the students exhibited strength in working in a state of uncertainty. Course activities taught students how to toggle between short- and long-term thinking and the longstanding consequences of what they design. As a result, interactions with students indicated that they had developed mindfulness for futures when intervening in the present. The students also noted that this course connected well to design studies courses that they had taken in prior years that focused on cultures, systems, and futures. They explained that these courses helped them see salient points in their learning of Transition Design and apply the knowledge and skills that they had acquired over several years to real-world challenges in meaningful ways.

Students learned the value of satisfying the needs of all living things through design. Given that class activities and discussions included mindfulness for all living things, students intuitively adopted a living-centered, rather than human-centered approach for design. In

fact, when introduced to Manfred Max-Neef's categorization of human needs (1991), students promptly pushed back, explaining the framework's lack of inclusiveness relative to all living things. Nonetheless, his theory served as a tool that helped students understand how design satisfies or inhibits a range of human needs. Through their analysis and proposal of designed products, communications, environments, and services, students also demonstrated a realization of the value of helping communities control the satisfaction of their human needs at a local level.

Students assembled a toolkit that aids their own proposals for design interventions. Next, in order to move beyond theoretical discussions of large, long-term systems change, students took the methods and approaches that they learned throughout the course and applied them to the design of interventions in the present day. Instead of seeing insurmountable design challenges, they demonstrated strengths in articulating the characteristics of specific situations and suggesting appropriate methods and tools to investigate and move through the problems. As a result, they exhibited confidence and agility in tackling ambiguous challenges rooted in service design and design for social innovation, which often reside within the larger umbrella of Transition Design.

Students developed a mindfulness for their actions and experienced a mindset shift. Through several weeks of intense work sessions with their group of peers, students started to recognize collaboration as a critical component of Transition Design, which they practiced and advocated. Plus, although the process was vastly different than what they experienced in the past, the students indicated an understanding of the value of designing a series of "interventions" over a long period of time instead of "solutions" that existed solely in the present. Their approaches often took a "less is more" approach to design, illustrating a soft hand in intervening. By the middle of the term, students were able to describe the potential impact design could have in seeding and catalyzing positive change in the world and accepted important responsibilities in leading these efforts.

Challenges

Given that fall 2017 marked the first delivery of the Design Research Studio, the instructors spent several months prior to the term carefully planning the course. Nonetheless, its development was based on lessons learned through the investigation and development of Transition Design theories, workshops, and a graduate seminar course that had been previously conducted. The differences in the course structure, its duration, and the nature of the cohort caused new challenges to arise for us to address.

The structure and format of the course wasn't always conducive to the type of learning necessary. Early in the course, students recognized the importance of working with stakeholders, as they lacked a genuine understanding of stakeholders' concerns and aspirations. Nonetheless, as instructors, we firmly believe we have an ethical responsibility to do no harm. In design education, we often follow a practice of gathering information from stakeholders in local communities for short-term studies that is often devoid of symbi-

otic exchange. This approach to research runs the risk of causing participants to become disenfranchised from the process as their engagement fails to lead to improvements in their communities due to the short duration of the projects. We chose not to contribute to this problem, which in turn led to challenges in the classroom. As we expected, students struggled to work within a hypothetical context. They expressed discomfort in basing design proposals on the limited information they gathered about stakeholders and sought to validate or negate their design interventions in realistic settings.

Although students stated an appreciation for the content of the course, they explained the difficulty in it being structured as a survey of approaches and methods. The students were gaining exposure to a broad range of topics that are critical to the study and practice of Transition Design. However, the course lacked ample time to frequently engage students in rich conversations that aided their deep understanding of the topics covered. As a result, the students expressed frustration in not fully grasping the relevance of the course content to their immediate practice of design.

The course sometimes failed to situate students' learning within a broad and critical design context. Many of the class sessions consisted of short lectures and discussions, followed by exercises that aimed to solidify students' learning of course concepts. Although the fast-paced nature of the described format enabled us to cover a lot of information and sustain student engagement, it also frequently caused students to lose sight of the big picture, as we did not continually situate their incremental knowledge and skill acquisition in the context of a larger whole grounded in Transition Design.

The students also noted an appreciation for specific approaches introduced in the course but questioned how opposing theories may function. They sought comparisons that would prevent them from making ill-informed design decisions. Given the short duration of the course and the amount of information we aimed to cover, we chose to narrow the amount of content that we provided to the students so as not to overwhelm them. However, in future deliveries of the course, we will find ways to include additional source material to address this concern.

Students struggled to adopt design behaviors that misaligned with their prior experiences. As undergraduate students, the senior cohort often participated in courses that encouraged them to learn and apply specific design approaches to clearly defined design problems. In contrast, the senior design research studio asked students to consider a range of design theories and develop hypotheses for effective courses of action. Although common at the graduate level, this form of inquiry was foreign to the senior cohort. The inability to align current and prior design education experiences caused the students to have difficulty grasping the relevance of course activities.

Similarly, students spent most of the first half of the term working in teams of six on mapping and diagramming tasks that aimed to aid their understanding and practice of Transition Design. Several students expressed a frustration in the lack of making that took place in the course, which negatively impacted their motivation to fully engage in its activities. This observation indicated the students' narrow definition of making in design, as we had

believed that all of the activities that they performed were a form of making common in design practice.
Lastly, although the students were able to grasp the fundamentals of service design and design for social innovation relatively easily, applying the methods that we practiced in class using small-scale challenges to their Transition Design work that focused on wicked problems situated in Pittsburgh proved to be difficult. The students seemed conflicted in maintaining the mindset that their work should solve an immediate problem versus shifting their view of design to planting seeds that catalyze systems-level change over a long period of time. We continually discussed their stumbling blocks and referred to their work as interventions to help them adopt a design posture and mindset that facilitates effective work in Transition Design.

Ideas for Improvement
The discoveries that we gleaned while teaching the Design Research Studio informed changes in planning that were made each week. We believe that it is critical for necessary shifts to occur in the course, as they show students the importance of being agile, empathetic, responsive, and transparent when working in Transition Design. Nonetheless, some challenges were too large for us to address immediately. Therefore, we have begun to brainstorm ways of combatting current obstacles in future manifestations of the course.

Explicitly seed Transition Design approaches earlier in the undergraduate curriculum. We believe it would be beneficial for design courses that precede the Design Research Studio to highlight approaches that are relevant to Transition Design as a means of aiding students' deep dive into the topic during their senior year of study. For example, drawing students' attention to collaborative mapping as a form of making and describing the benefits of designing as a means of speculating rather than solving problems would help students more easily adopt the mindset and posture that is pertinent to the study and practice of Transition Design. Similarly, students noted the benefits of design studies courses that they had taken in prior years, which focused on cultures, systems, and futures, in aiding their current thinking in Transition Design.

Build a comprehensive repository of materials in Transition Design, service design, and design for social innovation. Several times throughout the course, we realized the importance of providing students with a range of readings relevant to the course content. In an attempt to not overwhelm the students, we introduced them to a few texts each week. However, as the term progressed, we discovered that the modest sampling failed to introduce students to a diverse set of perspectives. In the future, we plan to give students a list of required and recommended readings that includes short descriptions of how they relate to one another. The nature of course activities also highlighted a need for case studies situated in the context of Transition Design, service design, and design for social innovation. We anticipate that these readings will help students to understand the application of the theories we discuss, describing the characteristics of each area of design focus, and guiding them through similar processes.

Gather a body of data on local Transition Design–topic stakeholders for students to study. Wanting to adhere to the ethical obligation to do no harm in communities by not taking advantage of stakeholders for research purposes, we sought alternative ways of providing students with pertinent information. In looking to practices in the field, we found that anthropologists rather than designers gather information from a large sampling of stakeholders, which designers then use to inform the direction of their interventions. Although working directly with stakeholders creates a level of empathy that cannot be achieved by reviewing interview transcripts, this approach would give students a broad sampling of stakeholder input, which they cannot achieve by working with a few members of stakeholder groups. As a result, we plan to build a body of data that students can use to ground their projects in subsequent deliveries of the course.

Continually connect course content to a broader context and practice of design. Despite having built a mental model for the course that illustrates the connections between elements of course content, we inadvertently focused the students' attention on immediate tasks without reference to how they were situated within the broader context of Transition Design. As a result, students struggled to see the relevance of tasks and the connections among them. Thus, we plan to build time for discussing and visualizing the connectedness of course content into the curriculum. Moreover, although we ask students to reflect on course activities and write about their thoughts, we believe students would benefit from well-articulated prompts that direct their attention and aid their development of a mental model for all of the course content.

Part II: Doctoral Student Workshops as Transition Design Research

Transition Design is bound up in doctoral design research, practice, and teaching. Doctoral students not only read and synthesize foundational texts for Transition Design but they also apply the theories in practice-based design research. That is, the teaching and research of Transition Design takes place *through* design research: through direct engagements with constituents and communities, in workshops that serve as test beds for Transition Design research, and as a means to test out and evaluate design methods.

Carnegie Mellon has two doctoral programs in the School of Design: a traditional PhD (PhD in Transition Design) and a non-residential, practice-based Doctorate of Design (DDes) program (Professional Doctorate). PhD students, who are mostly residential, pursue a four-year degree that culminates in a dissertation. DDes students are non-residential and participate in a three-year program: they remain in their companies and practices while pursuing their research remotely and attend two to three intensives a year on campus. The DDes provides students an opportunity for career-pivoting work, with a curriculum informed by Transition Design, and the externalization of research in a practical manner (such as in non-academic workshops and community engagements).

In this section, we will look at workshops *as* design research, some of the findings that doctoral students at Carnegie Mellon have discovered in using these practices, and the broader implications for Transition Design practice. Serving as lenses into the workshops,

we introduce three doctoral students at Carnegie Mellon: Dimeji Onafuwa, Deepa Butoliya, and Alex Wright. Onafuwa and Butoliya are final year PhD students, and Wright is a Doctorate of Design student (in the three-year, non-residential, practice-based doctoral program). Each of them uses workshops in different ways in their practices, leading to different findings in and through the process.

Three Students, Three Workshop Approaches

Dimeji Onafuwa is studying practices around the commons and cooperative platforms: his research probes how "Elinor Ostrom's design principles of commoning serve as a foundation for exploring new approaches to user experience on platforms". He applies these questions to two domains: tenancy and data, asking if and how housing tenancy might be viewed as a commons and whether there is a possibility of a "datashed" being a commons for data sharing. Onafuwa built a theoretical framework for his topic in his first year, while working on an app for tenants in Pittsburgh. From the learnings of that project, he later engaged with the Portland Tenants Union and with Intel Research on data sharing and datasheds. He has held workshops in which he developed pattern cards, inspired by Christopher Alexander's pattern languages and by Yoruba aesthetic and narrative principles in storytelling, which explored roles and patterns within the new commons. Figures 15 and 16 show the front and back of a Dilemma card and Figure 17 shows one of eight Role cards (the Town Crier) used in Onafuwa's workshop. Figure 18 is one of the patterns he developed.

Deepa Butoliya's work is in the area of speculative critical design in the Global South, with a focus on what she terms "critical jugaad". She takes the Hindu-language word "jugaad", which refers to ad hoc, make-do solutions with at-hand materials, juxtaposing it with speculative design practices. She co-curated an exhibition called Climactic: Post-Normal Design that opened in November 2016. In addition to the selected global work displayed in the exhibition, undergraduate students in her Critical Speculative Design class designed pieces for the exhibition, and she organized and led workshops during the exhibition run that engaged participants in its content. Shown here is an example of critical jugaad that she displayed in the exhibition: a gas mask, constructed out of ready-at-hand materials (See Figure 19).

Alex Wright, senior director of user experience at Etsy, is a DDes student whose focus is on regenerative user experience (UX) design. He is developing workshops and a curriculum that encourages fellow designers to reframe their practices in more sustainable terms. He is currently teaching a class on futuring at Etsy throughout the fall 2017 term that is open to all Etsy employees, not just designers. The output of this research will be a curriculum design for professional interaction/UX designers and professional doctoral students –potentially also for the Doctorate of Design program itself. Wright works with both internal and external constituents. In his workshops, Wright finds he acts as a translator, bridging the interests of his non-academic audiences while encouraging them to explore longer-term concerns and a more progressive vision of the future. In March 2017, he held two workshops in Pittsburgh in conjunction with Good Work Institute (formerly Etsy.org). In the first workshop –"Purposeful Work"– Wright and Good Work Institute managing di-

rector Erica Dorn guided Carnegie Mellon students in mapping personal values to future career plans: Figure 20 shows how one student selected values that were important to her. In the second workshop –"THINK Good"– Wright, Dorn, and Carnegie Mellon Professor Kristin Hughes engaged local entrepreneurs, creatives, and government participants in a conversation around resources and ecosystems, centered on Ethan Roland's eight forms of capital (intellectual, social, spiritual, material, financial, experiential, cultural, and living) (2011). Figure 21 shows one sketch by a participant of the relationship of the eight forms of capital to their small business and their life.

Learning from Workshops

Through the workshops that they designed, Onafuwa, Butoliya, and Wright expand the boundaries of Transition Design and Transition Design practices. They have learned several lessons in reflection on the process. We summarize some of them here.

Participants begin to think big on shared terrain. Workshops open participants to new experiences and ways of learning. "At a high level, what resonates is the appeal to a bigger vision –people yearn for that, they're hungry for it". Wright says about the impact of the workshops he leads. "People feel trapped in their boxes but want to think in a broader way. They're seeking the interconnections at a systems level" (A. G. Wright, personal communication, October 17, 2017). Wright helps guide his attendees in envisioning a progressive vision of the future. However, he finds that workshops such as these are successful when attendees hold points of commonality: fellow students on the cusp of new careers, for instance, or colleagues at Etsy. In Butoliya's workshops, attendees work with their hands to create their own examples of jugaad, using at-hand materials to build masks. In this experiential learning activity, participants begin to understand what it is to find jugaad and begin to grasp it as a worldview.

The diversity of audiences requires workshop content to be tailored and translated. The audience of Transition Design workshops varies widely. In the teaching of Transition Design, doctoral students may thus be teaching students of different levels and backgrounds, including but not limited to Carnegie Mellon students at the undergraduate and master's level (as discussed previously); executives and stakeholders within organizations; colleagues within their own companies; their companies' customers or constituents (such as participants in social innovation efforts); fellow design scholars; and members of local communities with whom a doctoral student is engaged in research. With that the case, Transition Design language might be an obstacle for people who are career-focused and don't typically think beyond what they're doing on a day-to-day basis in their jobs and businesses.

"You're learning about yourself as a designer". Mindset and posture are foundational elements in Transition Design, in which the designer or participant confronts their worldview and may find that it changes in the process. For doctoral students like Onafuwa, Transition Design is less about following methods and more about developing who he is as a designer. Designers in Transition Design practice, foster, steward, and navigate a varied set

Figure 15.

Figure 17.

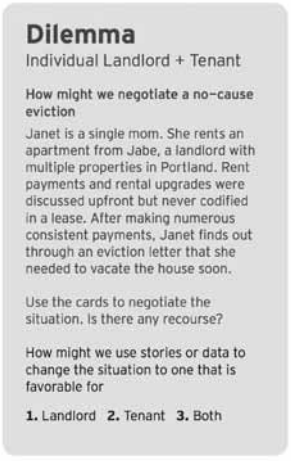

Figure 16.

Figure 18.

Figures 15-17. PhD candidate Dimeji Onafuwa created pattern cards, which were inspired by Christopher Alexander's pattern languages and by Yoruba aesthetic and narrative principles in storytelling. He used them in workshops to explore roles and patterns within the new commons. **Figure 18.** One of the patterns that Onafuwa developed.

Figure 19.

Figure 20.

Figure 19. In an exhibition called Climactic: Post-Normal Design, PhD candidate Deepa Butoliya shows an example of critical jugaad. It includes a gas mask, constructed out of ready-at-hand materials. **Figure 20.** A participant in a workshop conducted by DDes candidate Alex Wright and Good Work Institute managing director Erica Dorn maps her personal values to career plans. **Figure 21.** A participant sketched the relationship of the eight forms of capital to their small business and their life during the "THINK Good" workshop conducted by DDes candidate Alex Wright, Good Work Institute managing director Erica Dorn, and Carnegie Mellon Professor Kristin Hughes.

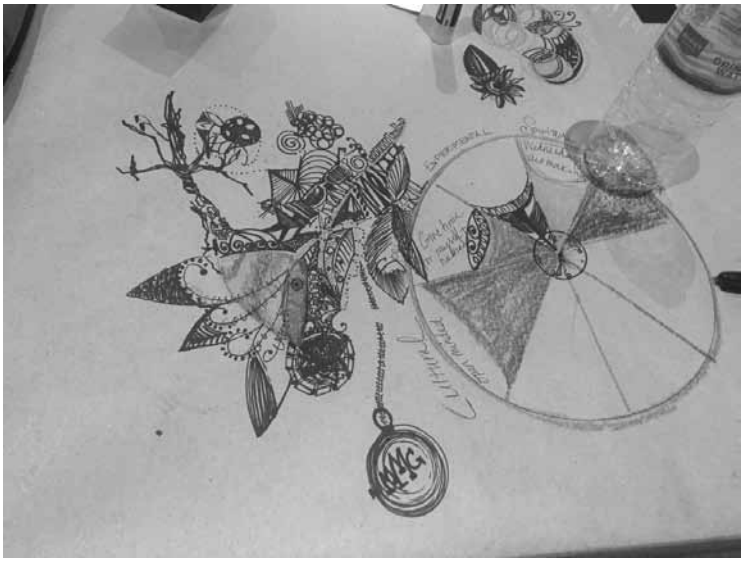

Figure 21.

of relationships with stakeholders who often don't come to consensus with one another. "I learned that the importance is not that it's empowering and democratizing but an agreement to move forward," Onafuwa said (personal communication, O. Onafuwa, October 17, 2017). "You can't negotiate yourself out of those problems, you just can't". The implications of this position for design are important: instead of design being a process that results in a finished product or service, the designer becomes a weaver of relationships in open-ended problems that are too complex to solve. The designer's ability to reflect is vital.

The practice of Transition Design functions as a set of nonlinear processes. Transition Design requires organizational processes and methods of synthesis that are non-linear. In designing workshops on the commons, Onafuwa started with mapping organizational tools for participants that were linear in nature. Two tools, the social design pathways matrix developed by the Winterhouse Institute (2017) and a linear continuum for commons depletion and regeneration that he developed, account for neither the complexity of the commons nor, more broadly, of transitions. He found that they did not offer an adequate model for the multiplicity of factors within Transition Design. When Onafuwa used social design pathways in the "Design for Social Innovation" course (co-taught with Silvia Mata-Marin at Carnegie Mellon in 2017), he noted that, "Transitions don't fit into those squares". Instead, transitions take place beyond what the squares represent and take into account more factors. Similarly, he found that the continuum he created for a workshop on commons depletion and regeneration did not reflect the richness of factors that arose: what is utilitarian, and what should be stewarded (cared for and protected)? How do the shifts between depletion and regeneration work? "It's not as linear [as the model] –it's messy. Commoning occurs in the shifting between all of those things– it's very hard to think of it in terms of a linear timescale," Onafuwa said. "It was brought to our attention that this model was very problematic to describe something related to transitions. It's not an ordered or practical process. It's messy" (personal communication, O. Onafuwa, October 17, 2017).

Designing for transitions requires designers to color outside the lines. At the doctoral level, we might best be learning that Transition Design requires us to color outside the lines. Just as we codify certain tools and processes to carry out with undergraduates, graduate students, and workshop participants, doctoral researchers push the boundaries of these methods, discover where they bend and break, and develop new methods. They reach out into different subject areas, such as sociology, economics, and data analytics, to inform their research. The learnings of the doctoral students may also challenge what and how we teach Transition Design to undergraduates and master's students at Carnegie Mellon. Rather than viewing curricular revisions in a negative light, we see the evolving process as appropriate for the emerging discipline of Transition Design that grows out of teaching and learning practices in higher education.

Teaching and Learning Transition Design: Some Conclusions

Given that Transition Design is in its infancy, we are developing curricula based on emerging theories, borrowing relevant approaches from other disciplines, and learning while doing. Although we have outlined practices that we have found effective and described discoveries we have made, many questions have arisen that we believe serve as opportunities for improving Transition Design curricula.

See Teaching and Learning about Transition Design as a Set of Feedback Loops
Our students have provided us with insights regarding the teaching of Transition Design that we had not foreseen. While some of their feedback reveals an anxiety for a new way of studying and practicing design, many of their comments describe successes or challenges in working with specific frameworks and obstacles they encounter when working with different teams of people over various amounts of time. We believe it is critical to build opportunities for feedback loops in educational settings to aid the critical review of teaching approaches and inform appropriate revisions.

Create New Tools for Transition Design Practice
We have utilized approaches developed by adjacent disciplines that have been identified as having potential in aiding the teaching, practice, and research of Transition Design. Nonetheless, the application of many of these methods indicates that although they may hold merit, they require improvements in order to function effectively. Our students have identified problems with existing frameworks and are brainstorming ways of revising or re-envisioning them to make them highly appropriate and useful to the tasks they encounter in Transition Design.

Develop Ethical Approaches for Teaching Transition Design
Whether learning Transition Design methods as a fourth-year undergraduate student in the context of a design research studio or running Transition Design workshops as a doctoral student, the issue of ethical engagement with the public is always at the forefront of curricular discussions. Wicked problems are symptoms of other problems, and to engage in any aspect of them is to intercede in the problem itself, which produces an ethical dilemma for teaching. Do we use a hypothetical context to teach students methods, void of interaction with stakeholders, or do we strive to build relationships with community groups without knowing if the development of a long-term relationship is realizable? Both approaches are problematic. Thus, there is a need for new approaches that help students understand the contexts of Transition Design in which they are working that are effective and ethical.

Seed and Catalyze Systems-Level Change through All Areas of Design

Despite the challenges we encounter in developing teaching of Transition Design, we believe the integration of this new form of design is critical to the success of our students as they embark on lifelong careers in various areas of design. Our doctoral students are focused on researching Transition Design and are directly engaged with the advancement of Transition Design practice. The new curricular methods they develop are directly related to these endeavors. However, for our undergraduate and graduate students, the practice of Transition Design may seem unrelated to their post-undergraduate careers. Nonetheless, we are confident that by exposing our undergraduate students –who are aiming to design products, communications, and environments in the near future– to longer design futures, we are teaching them to be mindful about the long-term consequences of their actions as designers and the materials that they use.

Summary

In summary, we seek to educate the next generation of designers in a manner that empowers them to seed and catalyze positive systems-level change in design. In this paper, we outlined our endeavors in the context of an undergraduate design research studio and in the work our doctoral students do through the workshops they hold, and we offer evidence of our successes and challenges. Also interwoven into the analysis of our teaching practice are our reflections as researchers and educators ourselves. The activity of teaching and learning as a symbiotic process has facilitated a shift in our own mindset and posture as designers, educators, and researchers.

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Resumen: Para el desarrollo del Diseño para la Transición, resulta fundamental su base en la *Educación Superior*. La base teórica que informa la práctica del Diseño para la Transición se desarrolla a partir de un proceso emergente compuesto de hipótesis, teoría y pruebas en entornos educativos. Estos enfoques, que se centran en abordar desafíos específicos, complejos y basados en la localización, deben adaptarse para abordar la naturaleza de contextos específicos y el aprendizaje variado de las cohortes de alumnos y sus respectivas necesidades. Este documento argumenta la importancia y la integración cuidadosa del Diseño para la Transición en la educación de diseño, e introduce un plan de estudios para estudiantes de diseño de pregrado y doctorado. Describe los métodos y herramientas que se utilizan en nuestra enseñanza, describe los éxitos, identifica los desafíos, presenta ideas para mejorar y propone oportunidades para el desarrollo.

Palabras clave: Diseño para la Transición - educación - currículo - enseñanza - aprendizaje - teoría - práctica.

Resumo: Para o desenvolvimento do Design para a Transição, é fundamental sua base na Educação Superior. A base teórica que informa a prática do Design para a Transição se desenvolve a partir de um processo emergente formado por hipóteses, teoria e provas em entornos educativos. Estes enfoques, centrados em abordar desafios específicos, complexos e baseados na localização, devem adaptar-se para abordar a natureza de contextos específicos e a aprendizagem variada das coortes de estudantes e suas respectivas necessidades. Este trabalho argumenta a importância e a integração cuidadosa do Design para a Transição na educação em design, e introduz um programa de estudos para estudantes de design de graduação e doutorado. Descreve os métodos e ferramentas que se utilizam nosso ensino, descreve os êxitos, identifica os desafios, apresenta ideias para melhorar y propõe oportunidades para o desenvolvimento.

Palavras chave: Design para a Transição - educação - currículo - ensino - aprendizagem - teoria - prática.

Fecha de recepción: diciembre 2017
Fecha de aceptación: marzo 2018
Versión final: julio 2019

Opacity, Transition, and Design Research

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Abstract: Historically, design education was structured around projects as solvable within a foreseeable and knowable future. However, researchers operating in the landscape of transition design must contend with far less certain terrain. Challenges fall outside the scope of what has commonly been understood as the designer's purview. Transition projects do not fit within the customary rhythms of political, economic, and governmental systems; they often require replete and complex coordination between actors in different systems; they are directed towards social, cultural, and psychological change; the location of practice is a living system that offers no reliable set of inflection points. Considering practice-based transition design research, this article outlines approaches taken, discusses challenges of conducting research, and proposes key considerations to address in future work.

Key words: Transition Design - futures - practice-based research - alternative economics.

[Abstracts in spanish and portuguese at pages 281-282]

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The Point of Departure

At the time of this writing, transition design research is a relatively new practice. Drawing from a host of transdisciplinary approaches, transition design's central goal is design-led, societal, or systems-level transformation towards more sustainable futures –a transdisciplinary approach for seeding and catalzying systems-level change and societal transitions (Irwin, Kossoff & Tonkinwise, 2015). Within the context of the authors' research, specific design projects within a transition design framework have taken many forms: designing objects that evoke specific behaviors, designing interactions that encourage the adoption of social practices, and designing new ways of organizing human activity. A framework for transition, proposed by Kossoff (2011), requires designing frameworks for transdisciplinary collaboration as an essential feature of any model of transition practice. A key aspect of that transdisciplinary collaboration is moving the locus of control for those practices away from remote governance couched in multinational corporations or technocratic, federated systems and towards systems that are organized and administrated locally, that can be evaluated by, and are directly accountable to, the people and natural systems that are affected by practices. Further, transition design is an approach to designing that grows fundamentally out of socialist, or anti-capitalist, economic systems (Irwin, 2015), viewing an extractive industrial economy as an essentially outmoded form and globalized capitalism as both a morally and fiscally bankrupt ideology.

The authors of this article have been engaged over the past four years in practice-based research, exploring processes of designing for collaboration and designing with collaborators. It is from this standpoint that we have developed two approaches for transdisciplinary collaboration: designing for deliberative conversation, and recommoning as approaches toward local, symmetrical conversations, negotiations, or collaborations between actors. In the course of this work, we have engaged in exploratory work with groups of stakeholders at different levels of systems, attempted new ways of practicing design, and developed approaches that are collaborative, that challenge the definitions of expertise, and that encourage people to assume agency in processes that are complex, difficult, and fraught. We have examined opportunities for helping people assume responsibility for their own systems, and helping people interface more effectively with government and other systemic actors that influence their lives and livelihood.

As researchers educated in design practice, coming to this point is made more challenging. As the site for transition designing is built upon the foundation of designing, where design (aside from some notable exceptions as the computer-supported cooperative work movement) has served (and continues to serve) as the accomplice of commercial economy. Professional practice, design research, and design education have evolved principally to serve the end of selling goods to people.

Because of how design education has been structured and how professional design practice has framed projects and approaches to problems, design researchers approaching researching transition practices and practitioners aspiring to engage in transition designing must strive to unset attitudes, beliefs, values, postures, and mindset (Irwin et al., 2015) that are a thoroughgoing presence in the greater discipline of design. Specifically, design researchers adopting a transition mindset must contend with challenges that, historically,

have fallen outside the purview of design. Namely, working in a mode where design acts fall outside of the scope of the customary rhythms of political, economic, and governmental systems; design acts require replete and complex coordination between actors in different systems; and design acts are directed towards social, cultural, and psychological (cognitive?) change, that is, beliefs, attitudes, and mindset. The argument that transition design is inherently local, or place-based, presupposes a design practice located in a particular living system –and living systems offer varied, anomalous intervention points. Therefore, research in transition design is confronted with particular challenges.
This article will detail some of the key challenges to conducting research in a transition design paradigm and will articulate some approaches to conducting work in this space.

How Designers are Trained to Think…

…And the Problem of Personas

A single chapter in Alan Cooper's *The Inmates are Running the Asylum* (1999) delineated an approach to design that moved a singular fictional user's experience to the center of evaluative considerations, supplanting technical concerns, business concerns, sales goals, and the designer's aesthetic. This intervention was a key point in the movement away from modernist concerns of simplicity and artistic representation (Itten, 1975) and towards the privileging of use-value as the essential way to understand the designed object (Cooper, 2008). In this subtle yet supremely powerful political move, Alan Cooper redirected the efforts of the design discipline, and the businesses designers advise, over the last score of years. Following a path begun by Donald Norman in his book *The Design of Everyday Things* (1988), Cooper and his accomplice, Jakob Nielsen, through his long-lived blog useit.com and *Designing Web Usability* (2000), also divert design towards addressing usability and human needs as the principal end and goal of design activity.
Still a prevalent approach in design practice and education (Kujik & Staats 2012), designing with personas establishes a set of relations of enablement and constraint (Schatzki 2002). This practice of designing focuses attention on fictional archetypal individuals, which may reflect the hegemony of the current culture more than what could or should be part of a future community.
Designing based upon personas reinforces the hegemony of the individual. In the fictional world of scenarios, critical paths, and use-cases created for product design, the persona takes on heroic proportions and valorizes the worst aspects of prioritizing needs. Structuring a design through personas bakes privilege into the system.
Though placing the human at the center has philosophical antecedents in humanism and the civil rights movement and purports to orient attention towards the dignity of the human as a vital part of an interaction that was once technologically centered, we have, with our personas, made the wrong turn at Albuquerque. The use of personas in design practice ensures that instead of designing for heterogeneity, we design for a singularity.
Designing with personas neglects the relational character of designing in contemporary, complex systems. Considering contemporary problems through the lens of the wicked problem of Rittel and Webber (1973), approaches to complex, multilayered challenges

that plague designers are, in essence, problems of relation and must be approached principally through facilitation (Conklin, 2006; Sanders & Stappers, 2014) and improvisation (Goodman, Stolterman, & Wakkary, 2011; Paquet, 2013 citing Weick, 2004).

…And the Problem with Solutions

The clichéd rhetoric of the problem/solution (IDEO, 2011) is as thoroughly embedded in the design discourse (Willis, 2015) as the use of the Post-it Note, or sketchbook. Framing design problems as solvable, and aspects of the problem as scientifically knowable, leads students down the perilous path to solutionism, where the challenges of the work are subsumed by the impractical effort to "solve" the problem.

To attain a position from which design might approach problems, rather than "create solutions" and "design our way out of it", designers need to focus on engagement with a network of stakeholders to collaboratively define the problem that is faced by the community, fuse collaborative coalitions from disparate groups, and coordinate subsequent efforts operating from various perspectives. Yet, much of design's education and professional practice remains oriented around the problem/solution dichotomy.

Design's Way of Knowing is Through Making

In order to approach problems, a requisite variety (Ashby, 1957) is necessary in the set of approaches to those problems. Speaking in generalities, the key way of knowing through design is knowing through making (Tonkinwise, 2008). Yet the making that is transition challenges designers to go beyond the scope of the thing-making that has preoccupied so much of design education. Transition approaches extend to service-making, system-making, community-making, world-making –activities that are little approached in the typical design curriculum.

Short Term-ism

Many transition projects must work outside of time scopes where projects exist in the commercial sense. Transition projects like Cheryl Dahle's Future of Fish may take 10 or 20 years to accomplish. Reconsolidating democracy and encouraging public participation in a governmental system that citizens view as broken is a challenging and long-term endeavor. Transition projects, unfortunately, don't fit well within the four- or even seven-year scope of a doctoral investigation. These types of projects also require long-term commitments from partner organizations and may require gaining the trust of different communities and community stakeholders across multiple levels of government, the nonprofit sector, and other community actors.

These long-term transition-oriented projects also fall outside of funding schemes of a capitalist system. The structures of annual reporting and the pressure to show results within a one-year timeframe make securing funding and the long-term commitment necessary to implement a transition project an extraordinary leap of faith.

Design educators have not been trained to think with a view towards designing transition. Designing in a long-term arc where visible markers of success may be deferred for months or years is not something that is part of education or professional practice. As yet, design has not developed a view that incorporates understanding shorter-term markers as indicative of longer-term success. Understanding and learning to focus on even a year-long project is not a skill that submits well to partitioning into month-long project sections that are contained within a 16-week semester. A typical professional design project has a scope of only three to six months and may be seasonally executed. A transition project might involve ebbs and flows of work over a period of years, retracing the same steps of introduction with each new stakeholder.

Many designers enter the workforce with the training and education provided by a Bachelor's degree in design or a related field. In spite of calls for nearly a decade to integrate systems thinking (AIGA, 2008; Davis, 2008) as a component of the approach to designing in education and professional practice, many undergraduate programs remain focused on the craft of design. In a typical four-year design program that is based on the semester system, within the 120 credits that comprise the BFA Design degree, 40-48 credits comprise the education in the major, with approximately one-half to two-thirds of that (24-32 credits) reserved for studio courses in the major. While this infuses students with essential basics –an understanding of the fundamental principles of design, approaches to formalism, an operational understanding of semiotics as applied to type, color and image– courses that operate outside of these boundaries are considered a luxury. Faculty continue to be evaluated as artists, discouraging a research culture within universities (Davis, 2016). Even design history courses are not extant uniformly across academic programs in the discipline, nor is the existence of courses to teach the important extra-formal skills of design (research, project planning, asset sourcing, collaboration, etc.). These skills are left to be folded into the studio and presented in an ad-hoc way as they occur throughout the students' work process.

After making the transition to professional practice, former students adopt the rhythms and practices of their new environments and bring with them skills that fit within their corporate contexts and the narrow scope of an entry-level designer's job responsibilities. Training for thinking strategically, planning in long-term arcs, and confidently designing while deferring the rewards of performance markers is not reinforced as part of the on-the-job training of professional practice. Paradoxically, the least experienced person in a corporate setting may have the most up-to-date skill set and be the most able to speak to the challenges particular to transition designing. Yet that person may be shunted towards craft-centered production work, where their knowledge goes untapped.

In professional practice, designers have a wealth of digital metrics to examine the efficacy of their work. A || B testing, sales metrics, application-use heatmaps, and user testing all provide immediate and actionable feedback that designers can use to evaluate the effectiveness of their work. Sidestepping for now whether this is an effective way of designing, or whether data-driven epistemologies can comment on how a designed object functions in a given culture, these metrics are part of a tight loop of use => measure => edit that typifies contemporary design approaches. In point of fact, the design-related discipline of human-computer interface design (HCI) is structured around these tight feedback loops

that generate information to streamline and optimize the production of an existing product or service.

Yet, it is not optimization that we need at this particular historical moment, when the center of understanding commerce and approaches that design might make as the handmaid of commerce is oriented towards data-driven optimization. Developing a suite of effective tools for smoothing rough edges off of applications, products, and services is not what transition design aims to produce. Rigorous tools that have been developed for knowledge production in HCI or design-based user testing can be ineffectual or even counterproductive when applied in a transition design context.

The goal for transition design research is both the unmaking of the existing order and reorienting the mangle of socio-technical systems and renegotiating their relationship with the so-called natural systems upon which they survive, like bacteria upon agar. While this may seem like the fever dreams of post-Marxist post-capitalist academics of the Anthropocene, there are real steps that a research practice in transition design can take to generate change in the current suite of approaches.

By and large, publicly traded companies' economic systems are organized around quarterly and annual reports. Sales, product development, research, and development are pressured to show value creation within 3- or 12-month time cycles (Laverty, 1996). That reporting cycle and its association with the perceived valuation of the work a company has produced over the last few months drives a kind cautiousness, an incrementalism in approach that focuses on short-term gains over riskier paradigm-shifting projects.

There are two important forces are at play in the design of products and services: innovation and optimization. Innovation (or if you prefer the currently vogueish term, disruption) approaches the problem field from the point of developing a novel approach, whereas optimization can only operate when there is an existing approach already at play. Innovating where a novel approach is introduced into a system is exceedingly rare. Once an initial approach is in place, organizations tend towards optimizing behavior.

The vast amount of business moves are optimizing, or "build a better mousetrap", moves. In the mousetrap scenario, the problem field is an area where undesirable rodents are living. At the conceptual level, virtually no innovation has occurred in the field of mousetraps since the device's invention. The central act is trapping or killing rodents with a device that must be set by a human and serviced by a human. The relation that the human has with this device has mostly remained unchanged. Innovation in this space might be represented by an approach that makes the entire house inhospitable to mice, or perhaps devices that attract more mice to live in the house to forward some end for the human residents of the house.

Transition design, with its particular focus on systemic problems and their manifestation in local systems, cannot presume the current system of capitalist-based extractive economy as tenable and instead proposes reorienting systems of production and supply towards local economies. It follows that this approach addresses designing for changes in scale, ownership, and material, as well as rethinking the set of systems that produced the unsustainable structures in the first place.

One might hope that political systems, with two-, four-, and six-year election cycles, might be the site for transition research, that elected officials might better understand the need

for the redevelopment of a community's physical and psychographic infrastructure, but within those systems, there is significant pressure to preserve the status quo and to focus on incremental steps that read favorably in news cycles and can be pointed to as a demonstration of policymaking success.

Challenging Paradigms with Sustainable Alternatives

A research practice in transition design looks beyond existing conditions to alternatives that might challenge what we perceive to be the norm. In *Take Back the Economy,* Julie Graham and Katherine Gibson, under the moniker J.K. Gibson-Graham, draw our attention to different activities that reside under the surface of this capitalist-driven economy. These activities exist beneath what they call "the iceberg economy," and they are very diverse – more diverse than we assume. These activities are also interconnected in ways that cannot be easily described within the current capitalist frames. Some of them include bartering systems, producer and consumer cooperatives, local unions, small collectives, produsages, transactions between friends, and different forms of unpaid labor, to name a few (Gibson-Graham, 2013, pp. 10-11). They point to the disproportionality with which we ascribe value to labor. And they show us how unsustainable our more visible everyday practices are. When labor is uncategorizable under the current system, there's a tendency to believe that it does not exist. However, what is unsustainable is the mass production of goods perpetuated by the effects of the Industrialization Era. The expansion during this era enabled manufacturers to continue to introduce new products to an ever wider audience. However, this unfettered appetite for growth has led us to an over-reliance on otherwise limited resources. Economies predicated upon the extraction and consumption of what was once thought to be unlimited resources has also increased our appetite for products at all cost without regard to the origins of the material resources, leading to large-scale global problems. We have reached the age in which our consumption has a direct effect on the livelihood of others. This unfettered growth has also led to an expansion of the wealth gap –between "rich" and "poor" countries, as well as "rich" and "poor" households. Most importantly, it is leading us on a course from which we may never return. Most of what we think is unlimited economic growth may be waste, as the systemic problems we face are interconnected. Unmitigated economic growth affects our natural environment as well as our collective well-being (Capra & Luisi, 2014, pp. 362-363). Tony Fry calls this societal failure "defuturing," and a course correction is needed, what he calls "redirective practice" (Fry, 2007, pp. 5-7) Fry's call for redirective practice reminds us to reconsider our preoccupation with productivism at the expense of our collective futures. Research in transition design causes us to look at other modes of living together and find new ways of organizing human activity.

New Ways of Organizing Human Activity

Discovering new ways of organizing human activity begins with rethinking how we share resources essential to our collective survival and exploring new (local and embedded)

techniques for sharing. One such resource is housing. In recent years, a cultural shift has led to access to shelter becoming a byproduct of neoliberal policies and global capitalist development. These policies have favored profit maximization over social responsibility and have left many social practices we have built around sharing housing on the wayside. An intervention point for transition designers is to re-prioritize housing and what "living together" means.

I. Deliberative Engagements: Top-Down

Decreased perception of the importance of a democratically elected government has created a moment of crisis for proponents of liberal democracy (Foa & Mounk, 2016). The recent rise of factually impoverished, emotionally overabundant political discourse in recent elections in the United Kingdom and the United States has continued to infect the discourse of several major governments in Europe and the Americas. In spite of this concern-worthy recent history, when examining discourse at the level of the individual, civic engagement events have shown that citizens can be trusted to discuss issues, share motivations, and come to conclusions (Fishkin & Luskin, 2005).

One of the authors of this paper, Michael, is engaged in research exploring the influence of a system of stakeholders and the power of material interventions in facilitating deliberative conversation. This work views the civic conversation as a key precursor to civic change and successful civic change as requiring engagement across a complex network of actors. A civic conversation is a key place for knowledge transfer, a moment where citizens are able to come to an understanding of the needs of the greater community, and a moment where they can articulate the challenges faced by their communities and the needs that these challenges entail. Citizens have the opportunity to hear the needs of their neighbors and perhaps place their own needs in the context of a portfolio of need across the entire community. The moment of the civic conversation is where government actors have the opportunity to collate critical information to guide policymaking and to develop a better understanding of the needs of the communities they serve. This understanding serves as a framework or heuristic to guide the creation and application of policy.

Affordable Housing Task Force. An example of the work is with the City of Pittsburgh's Affordable Housing Task Force (AHTF), which convened citizens to determine where areas of greatest housing need were within the city, and what solutions citizens wanted to see in their neighborhoods. Participants in the AHTF included city council members and representatives from 22 area businesses and not-for-profit organizations.

The city council convened the Affordable Housing Task Force, which was responsible for providing legislative and budgetary recommendations to the city council, which would ultimately structure the city's policy approach.

The perverse thing is, in these situations where there is a lot at stake for individuals, and many perceived levels where the distribution of responsibility between the levels and the potential for influence at each level is not well understood, stakeholders often attempt to exert influence at every level and at every step in the process. Some business groups and

community groups chose to eschew the public comment process entirely, instead attempting to influence city council members directly.
Protest groups with various political goals came to the public meetings in an attempt to make their presence felt in different ways. Some handed out flyers, some brought signs, some requested that they be allowed to watch the process. One group identified the exit survey as a vulnerable point for intervention and created stickers that residents could put on the survey instead of writing a personal narrative. Another group protested the choice of meeting locations, alleging (correctly) that there wasn't a meeting in a particular neighborhood hit hard by the recent fluctuations in the real estate market. Another group insisted that any notes that were taken by city employees at the meetings be published on the city's website. One key observation is that protesters are not an enemy to the process, as they contribute to the diversity of the conversation (Young, 2003).
The protocol asked attendees to evaluate the city's proposed housing priorities and values in relation to attendee's own needs and the needs of their neighborhoods. And despite (or perhaps because of) all the above, this was generally successful in producing unambiguous priorities for the Affordable Housing Task Force. In relation to other priorities: housing rehabilitation and home ownership emerged as key factors from the discussion. The rich network of interrelationships in a city, the variety of processes at work, diversity of people, and non-human actors, and the nested networks, or systems-within-systems nature, of cities make them fertile grounds for frameworks for participation and governance that tolerate rational applications within those frames. Deliberative democracy procedures can act as both a filtering and focusing element in civic conversations by bounding the problem at hand, providing relevant information to participants, and creating structures through which that feedback can be processed so that it can be effectively consumed by governmental entities.
However, deliberative democracy as an engagement that is only sponsored, in a top-down method, is perhaps not sufficient to catalyze social change on the grand scale that is referenced in writings of potential apocalyptic futures. Opportunities for designing conversations need to step outside the mode of facilitating the statutory requirements of municipal government and architectural firms doing public works. Designing engagement processes with a systems-level view of the network that is organized around seemingly intractable issues, and activating that network so that tangible outcomes can be produced, is a central project for transition design.

II. Negotiating Resource Sharing: Bottom-Up

In much of the United States, access to housing has increasingly become more difficult, especially because wages have failed to track with the steady increase in rental prices. In Portland, Oregon, for example, rents have seen over 10% annualized growth in the past year (compared to a U.S. average of 4%) while wages have only increased by about 4% (Hammill, 2016). These problems are not unique to Portland –they are global. A recent United Nations report on housing details a massive shift of global investments that are leaving homes empty even while many people remain homeless, because of increasing of enclosure tactics and privatization of property, which makes housing even more inacces-

sible. Housing is no longer valued based on the social benefits to communities. Instead, they are valued based on profitability, which is often prioritized over social good, leading to what Michael Heller calls the tragedy of the anticommons (1998). The anticommons property theory mirrors the commons property theory. In a commons, multiple stewards are granted the privilege to access and use a resource. Their right to access might lead to overuse and eventual depletion and scarcity. The inverse happens with the anticommons, that is, when we have multiple owners who are endowed to exclude others from use of a scarce resource, the exclusionary tactics lead to underuse even in light of desperate need.
An example showing the emergence of this tragedy is the city of Melbourne, Australia, which has over 80,000 properties. Yet many residents, find it tough to access housing. This problem is fueling racial and social inequalities that are hard to surmount (Foster, 2017). Large and mid-sized cities in the United States are facing similar tragedies, including New York City, Charlotte, North Carolina, Los Angeles, California, Pittsburgh, Pennsylvania, and Portland, Oregon. The effects of rent increases and housing inaccessibility are by and large affecting communities. They are spiking rates of homelessness, reducing safety and leading to underperforming schools.

Portland Tenants United. Dimeji, the other author of this paper, works with Portland Tenants United (PTU) in the city of Portland. PTU is a local collective comprising tenants and a few landlords agitating for policy changes regarding housing, as well as attempting to redefine the relationship between landlords and tenants by creating better mechanisms for negotiation. They aim to intervene at different levels of the problem. PTU forces the issue that housing is a fundamental human right, something that we all need to survive, by mobilizing tenants to build a counter-power to the "landlord lobby."
PTU has enjoyed a few recent successes, one of which is an amendment to what is called the Relocation Ordinance (Ordinance 188219), which was passed on February 3, 2017, to provide protections for tenants facing no-cause evictions. The amendment added a clause that mandated relocation assistance when these tenants are involuntarily displaced (Portland Auditor's Office, 2017). While modest, these additions to the law are quickly becoming a legislative template for other laws in Washington State as well as other parts of Oregon. However, PTU members are well aware that these laws, while they are modest gains, need to be ratified and made permanent. Through a series of transition design workshops, they are looking at different ways of converting these temporary laws into permanent cultural shifts. For example, they are investigating ways to reward positively deviant landlords with "tenant-approved" seals that indicate their commitments to tenant rights.
Bringing a unique posture to these types of social problems is essential to research practice in transition design. The altered posture of a transition design researcher comes from a place of realizing that the designer is not always "central" to the project and may instead play a critical role as facilitator, convener, or catalyst. The community itself brings a level of expertise that is not available to the designer (Fischer, 2000). There are also cultural nuances that should be accounted for that reside outside of the designer's purview. This particular example of work with PTU has members actively engaging in local politics. They know a lot about the policy positions of various members of city council. Members are also familiar with motivating members of city council, using a combination of public

shaming and negotiation tactics to get those members to the table so public action groups can attempt to sway their opinion.

Innovating in Pre-collapse

Transition design practice leads to innovation that helps a failing system avert collapse. Such system innovation, when adequately incubated, may allow for changes to be made at different points of inflection. The potential for a system to avert collapse is often enhanced either through socio-technical interventions or through learned indigenous behaviors that reduce intractability. If successful, these interventions create discontinuities with the status quo by presenting radically "new" alternatives.

III. Creating Alliances: Outside-In

Future of Fish. Future of Fish supports change at all levels in the sustainable seafood industry through convening stakeholders to co-design systems-level interventions. As the former Future of Fish CEO Cheryl Dahle shared in an interview, "the platform" for these interventions is comprised of the people that participate in different aspects of the seafood supply chain –from the individual fishers to distributors, restaurateurs, and chefs. Participants are invited to co-design sessions to convene where the end goal is creativity, not consensus. Dahle argues that driving consensus is not the priority of the workshops. Instead, the focus is on the power of design to shift the discussion from overall individual successes to that of agreement on next moves. Participants start the process with disagreements, do enough research to see where their interests align, and come to the realization that these alignments could serve as entry points to further conversations. With guidance from facilitators, the idea-generation process is built on authenticity and creative energy.
Like the broad-based issues that affect cities, Dahle and her team believe that seafood sustainability is a systemic problem. An extractive, capitalist mindset results in practices that are quickly depleting our oceanic resources and that foster a system that is unable to trace the seafood from catch to plate with any degree of accuracy. As a result, the system needs intervention. Dahle is convinced that when participants in the system hear stories of the daily struggles others within the system are facing, and consider those stories in light of their own practices and situated expertise, they will make better decisions, and these decisions will be meaningful for the overall system.
In light of innovations that improve feedback within the system, only a small percentage of bad actors will continue to be motivated by monetary incentives to act illegally by falsely labeling fish. According to Dahle, this group is only about 10%-15% of the total population, and they will be offset by individuals that require no incentive to do the right thing. A larger middle tier consists of those who opportunistically shift back and forth between acting appropriately and cheating the system. This segment is ripe for design intervention and is consequently the focus of most of Future of Fish's effort. As Dahle states, "If you can prove to people that the upside of technology is financially better than the upside of fraud,

then they will want to contribute". Doing this requires integrating technology, providing correct data, and telling the story of sustainable seafood as not only good for the environment but also as providing better value. It is data and amplification that get you to the tipping point that causes a systemic shift. "A few years from now, data and fish are going to be paired with no room for bad actors", Cheryl Dahle believes.
Transition design encompasses big-picture thinking, multi-phase, multi-level, and multi-pattern interventions. Additionally, this practice requires seeing smaller-scale implications within seemingly intractable problem spaces. Transition designers such as Cheryl Dahle understand the patterns (from human, ecological, and socio-technical systems), identify levers for collaboration, in this case, within the seafood systems, and see how these might be translatable to human behavior.

IV. Learning from Indigenous Practices: Inside-Out

Makoko fishing settlement. A resilient community has strong local networks and governing mechanisms. The settlement of Makoko in southwestern Nigeria embodies these characteristics. Makoko is a floating settlement, a city built on stilts on the Lagos lagoon. Established in the 19th century by the Egun and other tribes who migrated from Badagry, Benin, and Togo, present-day Makoko comprises six distinct villages: Adogbo, Apollo, Agbon, Migbewhe, Oko, Sogunro, and Yanshiwhe. It is the world's largest floating city, with almost 100,000 residents. As Lagos state government efforts to demolish the settlements have failed, Makoko villagers find themselves pushed further into the waterways where they have established residence. Nowadays, Makoko is a self-sustaining community independent of the government. They have their own local government and schools. The city has developed local governance and resource-sharing mechanisms to ensure residents' collective survival. For example, Makoko boasts one of the lowest crime rates in Lagos because of their self-policing systems. Yet, Makoko is faced with significant challenges. In particular, residents depend on the water for their livelihood, but the water is increasingly contaminated, and residents are facing risks of exposure to water-borne diseases such as typhoid and cholera (Ogunlesi, 2016).
One of the reasons Makoko residents are facing displacement is that the areas around the settlements are high-income communities built on reclaimed land. Makoko is also highly visible from a nearby major bridge –the Third Mainland Bridge– a gateway access into the greater Lagos area (Ajayi, et al., 2014). These communities are also experiencing the adverse effects of climate change. Homes in Lekki and Victoria Island often flood, and many streets are frequently waterlogged and impassable. However, many Makoko residents have adopted strategies for dealing with permanent flooding. For one, their houses are built on stilts using a combination of wood, metals, and found objects that are mostly resistant to rising water levels. Also, Makoko is, in effect, a future city, as the increasing saturation of land mass, as well as climate change and rising sea levels, will lead us to envision alternatives for building coastal settlements. We only need to look at cities such as New Orleans, Louisiana, as well as the Florida Keys, to conclude that coastal settlements are precarious, that variable water levels are a concern. Makoko is a foretelling of that new

reality for coastal communities. Considering the challenges Makoko residents are facing, we are beginning to see in old, indigenous communities new configurations of human life in a contemporary context –emergent strategies for collaboration and social organization, innovative approaches to deliver infrastructural needs, and residents working with the immediate environment to ensure survival.

Implications for Transition Design Research and Practice

Changing Culture

Much of transition design is about changing culture. But cultural change is slow, and it takes time. Transition design research refigures the culture of design research and design practice itself. Design practice has always been short-term, assumed resource extraction from a closed system, and preoccupied with artifact, materials, and products. Transition design projects have much longer lifespans, and they are not merely solutions-oriented, as many of the problems they attempt to address are "unsolvable" by their nature (Tonkinwise, 2015). Transition designers are aware of this predicament and are comfortable with modest interventions and hope that when these interventions are networked, they may eventually cause the system to shift. Ezio Manzini (2015) states, "In transition, we need to experiment with new solutions, then consolidate and replicate the best ones. These must then be connected so that multiplicity of small initiatives may make great impact". (p. 5)
According to Richard Buchanan, culture is what is happening in practices. He defines culture as a verb –regarding what it does as opposed to what it is. "Culturing" is something that is always occurring: "Culture is not a state, expressed in an ideology or a body of doctrines. It is an activity. Culture is the activity of ordering, disordering and reordering in the search for understanding and for values which guide action". (Buchanan, 1998, p. 10)
Much like with culture, we are always transitioning. Our societies are always shifting. What is particularly difficult about this is that transition designers are working within the same culture they are attempting to change. This, however, is the messiness of design research. We have to be able to step outside of the problem and analyze the consequences of system disruptions and step back in to intervene. What this means is designers are bringing in the culture of design itself to address transition-related problems.

Working with Others

The messiness of transition design research (and much of design research) means that researchers must always be aware of their limitations. Researchers work within transdisciplinary contexts to reveal underlying community values, beliefs, and attitudes and analyze problems to reveal intervention points. They rely on skillsets from a broad array of disciplines, including anthropology, history, psychology, literature, and design. They are comfortable with not being at the center of every project. When the expertise for addressing large-scale systemic problems is distributed, they focus and leverage the combined expertise to foreground more effective ways to intervene.

Figure 1.

Figure 2.

Figure 3a.

Figure 3b.

Figure 4.

Figure 5.

Figure 1. Pittsburgh residents at the Kingsley Community Center (2015) deliberatively discuss options for affordable housing in the city. Photo courtesy the City of Pittsburgh. **Figure 2.** Protesters from Pittsburgh Human Rights City Alliance, a Pittsburgh-based community group at the Affordable Housing Task Force Deliberative Community Forum on North Side, 2015. Photo courtesy the City of Pittsburgh. **Figure 3.** Portland Tenants United using a combination of shaming (3a) and negotiation (3b) using "recommoning" tools to force changes in rental housing laws. Photo credits: Dimeji Onafuwa and Margot Black. **Figure 4.** Future of Fish co-design session on seafood traceability. Photo courtesy: Future of Fish. **Figure 5.** Makoko. Photo by Heinrich-Böll-Stiftung. Licensed under the Creative Commons Attribution-Share Alike 2.0 Generic license.

"Transition designers should also consider local perspectives, and they incorporate ideas across worldviews and generations. They also engage non-experts in the design process by relying on the unique perspectives they bring to the problem". (Manzini, 2015, p. 37)
They also consider evolutionary frameworks by looking for patterns of replication in systems. From an anthropological perspective, transition designers understand that humans co-exist with and live within social systems. Knowing how communities share knowledge, resources, practices, and beliefs helps us better predict what experiences might benefit other communities.
Instead of thinking of the solution to most design problems as merely cognitive (satisficing as the most optimal solution), transition designers seek a broader path that includes understanding and documenting the dynamic system in which the problem resides. They are more preoccupied with understanding the potential approaches and determining the best point of intervention than prescribing short-term solutions that may eventually have more dire consequences.
Ultimately, transition design must take on design as the object of its own practice. As an aspect of the turn to a sustainable future, design practice and education must resign not only the centrality of their position in creative practice but also give up the centrality of approaches and rhetoric that have become the mainstay for structuring design action. In return, these approaches can be replaced with a more collaborative and deliberative practice, more aware of the social and political dimensions within which it operates.

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Resumen: Históricamente, la educación de diseño se estructuró alrededor de proyectos como soluciones en un futuro previsible y cognoscible. Sin embargo, los investigadores que operan en el paisaje del Diseño para la Transición deben lidiar con un terreno mucho menos cierto. Los desafíos quedan fuera del alcance de lo que comúnmente se ha entendido como el ámbito del diseñador. Los proyectos de transición no encajan dentro de los ritmos habituales de los sistemas políticos, económicos y gubernamentales; a menudo requieren una coordinación completa y compleja entre los actores en diferentes sistemas; están dirigidos al cambio social, cultural y psicológico; la ubicación de la práctica es un sistema vivo que no ofrece un conjunto confiable de puntos de inflexión. Teniendo en cuenta la investigación de Diseño para la Transición basada en la práctica, este artículo describe los enfoques adoptados, analiza los desafíos de la realización de investigaciones y propone consideraciones clave para abordar en el trabajo futuro.

Palabras clave: Diseño para la transición, futuros, investigación basada en la práctica, economía alternativa

Resumo: Historicamente, a educação de design se estruturou ao redor de projetos como soluções num futuro previsível e cognoscível. Entretanto, os pesquisadores que operam na paisagem do Design para a Transição devem lutar com um território muito menos certo. Os desafios ficam fora do alcance do que comumente se denominou o âmbito do designer. Os projetos de transição não encaixam dentro dos ritmos habituais dos sistemas políticos, económicos e governamentais; com frequência requerem uma coordenação completa e

complexa entre os atores em diferentes sistemas; estão dirigidos à mudança social, cultural e psicológica; a localização da prática é um sistema vivo que não oferece um sistema confiável de pontos de inflexão. Tendo em conta a pesquisa de Design para a Transição baseada na prática, este artigo descreve os enfoques adotados, analisa os desafios da realização de pesquisas e propõe considerações chave para abordar no trabalho futuro.

Palavras chave: Design para a Transição - futuros - pesquisa baseada na prática - economia alternativa.

Currículum Vitae completo de los autores de Diseño en Perspectiva - Diseño para la Transición. Primera y Segunda Sección
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Carlos Soto. Artista plástico, diseñador gráfico, máster en Habilidades Directivas, Negociación y Comunicación, con 52 exposiciones de su trabajo artístico, trabaja actualmente en la serie *la agonía de la belleza y los hermanos mayores –los árboles–*, testimonio de la devastación de la naturaleza por parte del hombre. Con 35 años de experiencia docente y 23 años como Jefe de Programa de Diseño y Producción Gráfica, Diseño Gráfico y la especialización en Diseño de Contenidos Digitales en la Corporación Universitaria Unitec, Bogotá, Colombia. Jurado internacional del Concurso Theobaldo de Nigris (gráfica Latinoamericana), conferencista internacional, ha publicado artículos académicos en revistas nacionales e internacionales. Asiste con regularidad al Encuentro de Diseño convocado por la Universidad de Palermo y al Congreso de Enseñanza del Diseño y a diferentes espacios académicos defendiendo la tesis del diseño como profesión, con la necesidad de principios de identidad y una gran responsabilidad social. Autor de los libros "la poesía de la luz" y "la poética del paisaje", investigador y teórico del diseño.

Molly Steenson. Ph.D. Architecture, Princeton University; Master of Arts, Architecture, Princeton University; Master of Environmental Design, Yale School of Architecture; Bachelor of Arts, German, University of Wisconsin-Madison. Associate Professor, School of Design, Carnegie Mellon University; Director, Doctorate of Design (DDes) program. Area of research: history of architecture, design, artificial intelligence, and computation; service design.

Silvia Stivale. Arquitecta egresada de la Universidad Nacional de Buenos Aires, Magister Sciens en Gestión Ambiental Urbana de la Universidad Nacional de Mar del Plata. Docente-investigador en el área Histórico Social en la materia Economía y Marketing de la FAUD - UNMDP. Desarrolla tareas de investigación en el Centro de Investigaciones para Acciones de Diseño Industrial, (CIPADI) FAUD, de la UNMDP. Ha dictado seminarios de pos-grado sobre "Gestión de Proyectos sustentables" en el orden local e internacional. Directora de Tesis de Magister y de Becarios de posgrado de Doctorado. Co-directora de proyectos de Investigación. Su línea de trabajo es sobre temáticas de evaluación ambiental e incorporación de pautas sustentables en procesos productivos industriales/constructivos, aplicables al hábitat sostenible y diseño sustentable. Desarrollo de metodologías de evaluación urbano-arquitectónicas, análisis de ciclo de vida y determinación de impactos socio-económicos.

Cameron Tonkinwise. He holds a BA (Hons I) and a PhD from the University of Sydney. Cameron teaches design theory, design research, sustainable design, service design, and social design.

Publicaciones del Centro de Estudios en Diseño y Comunicación

El Centro de Estudios en Diseño y Comunicación de la Facultad de Diseño y Comunicación de la Universidad de Palermo desarrolla una amplia política editorial que incluye las siguientes publicaciones académicas de carácter periódico:

• Cuadernos del Centro de Estudios en Diseño y Comunicación [Ensayos]
Es una publicación periódica que reúne papers, ensayos y estudios sobre tendencias, problemáticas profesionales, tecnologías y enfoques epistemológicos en los campos del Diseño y la Comunicación.
Se publican de dos a cuatro números anuales con una tirada de 500 ejemplares que se distribuyen en forma gratuita.
Esta línea se edita desde el año 2000 en forma ininterrumpida, recibiendo colaboraciones remuneradas, dentro de las distintas temáticas.
La publicación tiene el número ISSN 1668.0227 de inscripción en el CAICYT-CONICET y tiene un Comité de Arbitraje.

• Creación y Producción en Diseño y Comunicación [Trabajos de estudiantes y egresados]
Es una línea de publicación periódica del Centro de Producción de la Facultad. Su objetivo es reunir los trabajos significativos de estudiantes y egresados de las diferentes carreras.
Las producciones (teórico, visual, proyectual, experimental y otros) se originan partiendo de recopilaciones bibliográficas, catálogos, guías, entre otros soportes.
La política editorial refleja los estándares de calidad del desarrollo de la currícula, evidenciando la diversidad de abordajes temáticos y metodológicos realizados por estudiantes y egresados, con la dirección y supervisión de los docentes de la Facultad.
Los trabajos son seleccionados por el claustro académico y evaluados para su publicación por el Comité de Arbitraje de la Serie.
Esta línea se edita desde el año 2004 en forma ininterrumpida, recibiendo colaboraciones para su publicación. El número de inscripción en el CAICYT-CONICET es el ISSN 1668-5229 y tiene Comité de Arbitraje.

• Escritos en la Facultad
Es una publicación periódica que reúne documentación institucional (guías, reglamentos, propuestas), producciones significativas de estudiantes (trabajos prácticos, resúmenes de trabajos finales de grado, concursos) y producciones pedagógicas de profesores (guías de trabajo, recopilaciones, propuestas académicas).
Se publican de cuatro a ocho números anuales con una tirada variable de 100 a 500 ejemplares de acuerdo a su utilización.

Esta serie se edita desde el año 2005 en forma ininterrumpida, su distribución es gratuita y recibe colaboraciones para su publicación. La misma tiene el número ISSN 1669-2306 de inscripción en el CAICYT-CONICET.

• Reflexión Académica en Diseño y Comunicación
Las Jornadas de Reflexión Académica son organizadas por la Facultad de Diseño y Comunicación desde el año 1993 y configuran el plan académico de la Facultad colaborando con su proyecto educativo a futuro. Estos encuentros se destinan al análisis, intercambio de experiencias y actualización de propuestas académicas y pedagógicas en torno a las disciplinas del diseño y la comunicación. Todos los docentes de la Facultad participan a través de sus ponencias, las cuales son editadas en el libro *Reflexión Académica en Diseño y Comunicación*, una publicación académica centrada en cuestiones de enseñanza-aprendizaje en los campos del diseño y las comunicaciones. La publicación (ISSN 1668-1673) se edita anualmente desde el 2000 con una tirada de 1000 ejemplares que se distribuyen en forma gratuita.

• Actas de Diseño
Actas de Diseño es una publicación semestral de la Facultad de Diseño y Comunicación, que reúne ponencias realizadas por académicos y profesionales nacionales y extranjeros. La publicación se organiza cada año en torno a la temática convocante del Encuentro Latinoamericano de Diseño, cuya primera edición fue en Agosto 2006. Cabe destacar que la Facultad ha sido la coordinadora del Foro de Escuelas de Diseño Latinoamericano y la sede inaugural ha sido Buenos Aires en el año 2006.
La publicación tiene el Número ISSN 1850-2032 de inscripción y tiene comité de arbitraje.

A continuación se detallan las ediciones históricas de la serie Cuadernos del Centro de Estudios en Diseño y Comunicación:

Cuadernos del Centro de Estudios de Diseño y Comunicación [ISSN 1668-0227]

> Cuadernos del Centro de Estudios en Diseño y Comunicación. [Ensayos]: **Convergencia pedagógica-digital: libros, lecturas y diseño. Ivana Mihal:** Prólogo. Narrativa transmedia. Convergencia pedagógica-digital: libros, lecturas y diseño | **Natalia Aguerre:** Arte y Medios: Narrativa transmedia y el translector | **Francisco Albarello**: El lector en la encrucijada: la *lectura/navegación* en las pantallas digitales | **María del Carmen Rosas Franco**: Nuevos soportes, nuevos modos de leer. La narrativa en la Literatura infantil y juvenil digital | **Florencia Lila Sorrentino**: Instantáneas: la lectura en los tiempos que corren | **Gustavo Bombini**: Didáctica de la lectura y la escritura y multimodalidad | **Mariana Landau**: Los discursos sobre tecnologías y educación en la esfera pública | **Mónica Pini**: Políticas de alfabetización digital. Educación e inclusión | **Lia Calabre**: Planos de livro e leitura em tempos da cultura digital | **Ana Ligia Medeiros y Gilda Olinto:** O impacto da tecnologia de informação e comunicação nas bibliotecas públicas: envolvimento comunitário, criatividade e inovação | **Eduardo Pereyra**: Juventudes y TIC: Estados locales frente al abordaje de la promoción de la lectura | **Daniela Szpilbarg**: Configuraciones emergentes

de circulación y lectura en el entorno digital: el caso de Bajalibros.com. (2019). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 72, mayo. Con Arbitraje.

> Cuadernos del Centro de Estudios en Diseño y Comunicación. [Ensayos]: **Cruces entre Cultura y Diseño: repensando el diseño de los procesos culturales y los abordajes culturales del diseño. Karen Avenburg y Marina Matarrese:** Introducción. Cruces entre Cultura y Diseño: repensando el diseño de los procesos culturales y los abordajes culturales del diseño | **Ivana Mihal:** Estéticas, lecturas e industria del libro: el caso de los e-books | **Laura Ferreño y María Laura Giménez:** Desafíos actuales de las políticas culturales. Análisis de caso en el Municipio de Avellaneda | **Silvia Benza:** El Distrito de Diseño en la Ciudad de Buenos Aires: una mirada desde los usos de la cultura en contextos globales y locales | **Natalia Aguerre:** Las performances musicales en las misiones jesuitas de guaraníes | **Julieta Infantino:** Arte y Transformación social. El aporte de artistas (circenses) en el diseño de políticas culturales urbanas | **Verónica Griselda Talellis, Elsa Alicia Martínez, Karen Avenburg y Alina Cibea:** Investigación y gestión cultural: diseñando articulaciones | **Verónica Paiva y Alejo García de la Cárcova:** Wright Mills y su crítica al diseño de segunda posguerra. Los aportes de la sociología al mundo del diseño | **Laura Zambrini:** Diseño e indumentaria: una mirada histórica sobre la estética de las identidades de género | **Bárbara Guershman:** Marcas de shopping o de diseñador. Los procesos de adscripción en la moda. (2019). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 71, marzo. Con Arbitraje.

> Cuadernos del Centro de Estudios en Diseño y Comunicación. [Ensayos]: **Materialidad difusa. Prácticas de diseño y tendencias. Daniel Wolf:** Prólogo de la Universidad de Palermo | **Jorge Pokropek y Ana Cravino:** Algunas precisiones sobre la borrosa noción de "Materia" para el diseño interior | **Leila Lemgruber Queiroz:** Desmaterialización e inmaterialidad en el contexto contemporáneo del Diseño | **Maximiliano Zito:** La sustentabilidad de Internet de las Cosas | **Gabriela Nuri Barón:** La des-materialización de productos tangibles en una perspectiva de sustentabilidad | **Marina Andrea Baima:** El proceso de diseño desde la génesis de los materiales | **Marinella Ferrara and Valentina Rognoli:** Introduction by the School of Design of Politecnico di Milano | **Marinella Ferrara and Anna Cecilia Russo:** The Italian Design Approach to Materials between tangible and intangible meanings | **Linda Worbin:** Designing for a start; irreversible dynamic textile patterns | **Zurich Manuel Kretzer:** Educating smart materials | **Murat Bengisu:** Biomimetic materials and design | **Valentina Rognoli and Camilo Ayala Garcia:** Material activism. New hybrid scenarios between design and technology | **Giulia Gerosa and Laura Daglio:** Diffuse materiality in public spaces between expressiveness and performance | **Giovanni Maria Conti:** Material for knitwear: a new contemporary design scenario | **Giulio Ceppi:** Slow+Design as sustainable sensoriality: an innovative approch aimed to explore the new relationships among design, innovation and sustainability. (2018). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 70, diciembre. Con Arbitraje.

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> Cuadernos del Centro de Estudios en Diseño y Comunicación. [Ensayos]: **Cine e Historia. Pluralidad de voces y miradas sobre el autoritarismo y el totalitarismo. Zulema Marzorati y Mercedes Pombo:** Prólogo | **Rodolfo Battagliese:** Poder estatal y dominación de género: sus representaciones en *La linterna roja* (China, 1991) de Zhang Yimou | **Lizel Tornay:** Representaciones de mujeres en el cine de realizadoras feministas durante los períodos posdictatoriales. España y Argentina | **Zulema Marzorati y Mercedes Pombo:** El fascismo en la pantalla: *Vincere* (Italia, Bellochio, 2009) | **Victoria Alvarez:** Cine, represión y género en la transición democrática. Un análisis de *La noche de los lápices* | **Tzvi Tal:** La estética del trauma y el discurso de la memoria: personajes infantiles ante el terror estatal en *Infancia clandestina* (Ávila, Argentina, 2011) | **Moira Cristiá:** Frente el autoritarismo,la creación. La experiencia de AIDA y su relectura en el film *El Exilio de Gardel* (Fernando Solanas, Francia / Argentina, 1985) | **Sonia Sasiain:** El lugar del Estado en la representación de la vivienda popular: desde la construcción de la opinión pública hacia la censura | **Mónica Gruber:** Medios y poder: *1984*. (2018). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 68, julio. Con Arbitraje.

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reflexión sobre su transformación en saber universitario | **Ana Cravino:** Enseñar Diseño: La emergencia de la teoría | **Mabel Amanda López:** Modos de decir y modos de ser: palabra e ideología en el taller de diseño | **Ana María Romano:** La construcción de la cosmovisión durante la enseñanza. (2018). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 67, mayo. Con Arbitraje.

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territorio | **V. Stefanini:** La mirada propia. El autorretrato en la fotografía contemporánea | **S. Faerm:** Introducción | **A. Fry, R. Alexander, and S. Ladhib:** Los emprendimientos en Diseño en la economía post-recesión: Parson`s E Lab, la Incubadora de Negocios de Diseño | **S. Faerm:** Desarrollando un nuevo valor en diseño; del "qué" al "cómo" | **A. Kurennaya:** Moda como práctica, Moda como proceso: los principios del lenguaje como marco para entender el proceso de diseño | **L. Beltran-Rubio:** Colombia for Export: Johanna Ortiz, Pepa Pombo y la recreación de la identidad cultural para el mercado global de la moda | **A. Fry, G. Goretti, S. Ladhib, E. Cianfanelli, and C. Overby:** "Artesanías de avanzada" integradas con el saber hacer; el papel del valor intangible y el rol central del artesano en el artesanato de alta gama del siglo 21 | **T. Werner and S. Faerm:** El uso de medios comerciales para involucrar e impactar de manera positiva en las comunidades. (2017). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 64, septiembre. Con Arbitraje.

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J. P. Lattanzi: **La crisis de las grandes narrativas del arte en el audiovisual latinoamericano: apuntes sobre el cine experimental latinoamericano en las décadas de 1960 y 1970** | N. Sorrivas: **El videoarte como herramienta pedagógica** | M. Cantú: **Archivos y video: no lo hemos comprendido todo** | E. Vallazza: **El video arte y la ausencia de un campo cultural específico como respuesta a su hibridación artística** | D. Foresta: **Los comienzos del videoarte (entrevista)** | G. Ignoto: **Borrado** | J-P Fargier: **Grand Canal & Mon Œil!** | R. Skryzak: **Las ensoñaciones de un videasta solitario** | G. Kortsarz: **El sol en mi cabeza** | **La identidad nacional. Representaciones culturales en Argentina y Serbia.** Z. Marzorati y B. Pantović: **Prólogo** | A. Mardikian: **Múltiples identidades narrativas en el espacio teatral** | D. Radojičić: **Identidad cultural. La película etnográfica en Serbia** | M. Pombo: **La fotografía argentina contemporánea. Una mirada hacia las comunidades indígenas** | T. Tal: **El Kruce de los Andes: memoria de San Martín y discurso político en Revolución (Ipiña, 2010)** | B. Pantović: **Serbia en imágenes: mensajes visuales de un país** | V. Trifunović y J. Diković: **La transformación post-socialista y la cultura popular: reflejo de la transición en series televisivas de Serbia** | S. Sasiain: **Espacios que educan: tres momentos en la historia de la educación en Argentina** | M. E. Stella: **A un cuarto de siglo, reflexiones sobre el Juicio a las Juntas Militares en Argentina** | A. Stagnaro: **Representaciones culturales e identitarias en cambio: habitus científico y políticas públicas en ciencia y tecnología en la Argentina** | A. Pavićević: **El Ángel Blanco. Desde Heraldo de la Resurrección hasta Portador de Fortuna. Comercialización del Arte Religioso en la Serbia post-comunista** | M. Stefanović Banović: **Ejemplos del uso de los símbolos cristianos en la vida cotidiana en Serbia** (2015). Buenos Aires: Universidad de Palermo, Facultad de Diseño y Comunicación, Centro de Estudios en Diseño y Comunicación. Vol. 52, mayo. Con Arbitraje.

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