rsd
Relating
Systems Thinking &
Design

18. – 20. October 2017

Lucy Kimbell   John Ehrenfeld   Michael Hensel   Richard Buchanan   Sabine Junginger   Karl Otto Ellefsen

Book of abstracts

Contents

RSD6 Keynotes

Keynote speakers, titles, abstracts and bios alphabetically

Richard Buchanan
Dialectic and Inquiry in Design: Understanding Surroundings and Systems, Designing Environments

Dialectic and Inquiry are two well-established strategies of design practice as well as design theory and research. Dialectic is the art of finding and interpreting systems in the relationships and interrelationships of our surroundings. In contrast, inquiry is the art of transforming surroundings into environments for human thought and action. The intersection of these two arts is the theme of this presentation. To make the theme concrete, I will focus on John Dewey's **Democracy and Education**, a book that is well-known in the context of progressive education. It has influenced all levels of education in places as different as the United States and China and across many disciplines. It is the foundation text of education as inquiry, encouraging creative thinking in the study of what is known and what is unknown. In the context of this presentation, however, the argument of Dewey's book will be explored as a rhetorical inquiry into society and the role of design in encouraging new social and cultural practices. In the course of my presentation, I will discuss different kinds of systems and how design contributes to the invention and discovery of new systems. The intersection of dialectic and inquiry is fertile ground for exploring new dimensions of design practice and theory in the complexity of contemporary life.

Richard Buchanan bio:

Richard Buchanan, PhD, is well known for extending the application of design into new areas of theory and practice, writing, and teaching as well as practicing the concepts and methods of interaction design. He argues that interaction design does not stop at the flatland of the computer screen but extends into the personal and social life of human beings and into the emerging area of service design, as well as into organizational and management design.

In keeping with this conviction, Buchanan has worked on the redesign of the Australian Taxation System, the restructuring of service products and information for the U.S. Postal Service, and other consulting activities. At Weatherhead, he has researched "collective interactions", focusing on problems of organizational change and the development of management education around the concept of Manage by Designing. His most recent projects involve strategy and service design, including patient experience, information services, and public sector design.

Buchanan is a widely published author and frequent speaker. His books include DISCOVERING DESIGN: EXPLORATIONS IN DESIGN STUDIES, THE IDEA OF DESIGN, and PLURALISM IN THEORY AND PRACTICE. He is coeditor of DESIGN ISSUES, the international journal of design history, theory and criticism. Buchanan has served for two terms as president of the Design Research Society, the international learned society of the design research community.

He received his AB and PhD from a prestigious interdisciplinary program at the University of Chicago called the Committee on the Analysis of Ideas and the Study of Methods. Before joining the Weatherhead School of Management faculty in 2008, he served as head of the school of design and then as director of doctoral studies in design at Carnegie Mellon University. While at Carnegie Mellon, he inaugurated interaction design programs at the master's and doctoral level.

In 2009, Buchanan received an honorary doctorate from the Faculté de l'amánagement (Environmental Design Faculty) at the University of Montréal.

PhD, The University of Chicago, 1973
AB, The University of Chicago, 1968

John Ehrenfeld
Flourishing Lives in Another World

The modernist bundle of beliefs and norms, which has powered Western societies for centuries, has begun to misfire badly in both the human and natural domains. "Sustainability" is not the answer. To return to a positive trajectory, the critical first move is to choose flourishing as the normative design objective for artefacts and institutions. Flourishing, as an existential feature of living systems, is a valid indicator of achievement of human and non-human potential, as contrasted to current economic and psychological metrics. This choice, alone, is insufficient; it must be accompanied by a radical shift in foundational cultural beliefs, replacing the most basic modern ones: the Cartesian, mechanistic world and the Smithian self-interested human being. The historic derivation of these two quasi-facts would not pass muster by today's standards. In their place, designers need to acknowledge and embody 1) the complexity of social and large-scale technological systems and 2) the inherent caring behavior of humans. Pragmatic epistemological and design methods are necessary to capture the fundamentally unpredictable nature of the highly interconnected, non-linear, real (not theoretical) world. I will present arguments for the assertions I have just made.

John Ehrenfeld bio:

Dr. John R. Ehrenfeld returned to his alma mater, MIT, in 1985 after a long career in the environmental field, and retired in 2000 as the Director of the MIT Program on Technology, Business, and Environment. Following that, he served until 2009 as Executive Director of the International Society for Industrial Ecology, guiding its development from its founding in 2000. He is the author of Sustainability by Design: A Subversive Strategy for Transforming our Consumer Culture, and Flourish: A Frank Conversion about Sustainability (with Andrew Hoffman). In October 1999, the World Resources Institute honored him with their first lifetime achievement award for his academic accomplishments in the field of business and environment. He received the Founders' Award for Distinguished Service from the Academy of Management's Organization and Natural Environment Division in August 2000. He spent part of the 1998-1999 academic year at the Technical University of Lisbon as a Fulbright Distinguished Scholar and was Visiting Professor at the Technical University of Delft during the 2000-1 academic year. He is an editor of the Journal of Industrial Ecology. He holds a B. S. and Sc. D. in Chemical Engineering from MIT, and is author or co-author of over 200 papers, books, reports, and other publications.

Karl Otto Ellefsen
The imprints of the fisheries on land – the dynamics and adaptions of a Norwegian fishing village.

Small towns and villages have in most parts of Europe, been developed through different kinds of planning strategies, headed by municipalities and governmental institutions. The intention – at least in Northern Europe with a strong social-democratic tradition and rudiments of planned economy – was that these strategies should be based on comprehensive knowledge collection. In the neo-liberal economy this way of working is scaled down and substituted by private and project oriented initiatives.

Myre is a fishing village in the Northern part of Norway, that the author has followed for 50 years, and investigated by discussing transforming morphologies. The place mirrors changes in the costal fisheries, in the industries and in regional policies. One of the reasons why this place at the moment is the most successful fishing harbor in the North, is the local culture´s ability to adapt to changes in fisheries and production. At the same time Myre illustrates basic challenges in Norwegian economy and settlement structure: the question of ownership to resources, the concept of "place" in a changing rural economy, and global forces versus local needs.

What are the potentials of introducing Systemic design methodologies offer in engaging with problems related to "place", and what are the limits of systemic design confronting conflict of interests and genuine political challenges?

Karl Otto Ellefsen bio:

Karl Otto Ellefsen is Professor in Architecture and Urbanism at the Oslo School of Architecture and Design (AHO). He served as Rector at AHO from year 2000 to 2014. He was also heading the board of Oslo Architecture Triennale until 2015 and is from 2013 the President of EAAE (European Association for Architectural Education).

Karl Otto Ellefsen is a practicing architect in the field of Urbanism and has produced scholarly writing within the History of Urbanism and Urban Design, Urban Strategies, Architectural Theory and Architectural Critique. He holds different roles in the development of Norwegian Architectural Policies and in the National Tourist Routes Project.

His research is situated in a morphological tradition of architectural and urban studies. Currently he is heading a doctoral programme in cooperation with East African universities on urban and peri-urban areas. He is visiting professor at CAFA in Beijing – The Central Academy of Fine Arts – and leads a set of case-studies on the urbanization of Chinese villages.

His latest book, "Fiskevær" ("Fishing Camp") deals with the challenges in fishery-based coastal settlements in Northern Norway.

Michael Hensel
Rights to Ground: Human and Non-human Rights
Integrated Design and Embedded Architectures

Due to current circumstances discussions focus again on questions of and challenges to basic rights, such as right of expression, privacy, data and information, design (as it becomes increasingly expensive commodity), and so on. However, one of the most basic questions remains relatively unaddressed, namely the right to ground. Throughout human history understandings existed that governed the temporary appropriation of private ground, such as the right to roam and the Scandinavian everyman's right. The latter is anchored in various ways in the Scandinavian context, ranging from constitutional to customary rights, etc. In the context of increasing urbanisation, landgrab, disapprerance of public space in large parts of the world, new walls between countries and potential fortification of parts of Europe, one may ask what the immediate future of access to ground will be. The presentation and paper will focus on a systemic and design approach to the question of the rights to ground, based on existing and projected arrangements. Furthermore urban, landscape and architectural design implications will be discussed and the scope will expanded to non-human rights to ground.

Michael Hensel bio

Prof. Michael U. Hensel [Dipl. Ing. Grad Dipl Des AA PhD Reading] is an architect, researcher, educator and writer. Currently he is tenured professor for architecture at AHO the Oslo School of Architecture and Design where he directs the Research Center for Architecture and Tectonics [RCAT]. He is a founding member of OCEAN (1994), and founding and current chairman of the OCEAN Design Research Association and the Sustainable Environment Association [SEA]. The OCEAN Design Research Association is an international and independent not-for-profit organization with the mission to conduct inter- and transdisciplinary research by design, and to develop overarching theoretical frameworks and related design methods in its specific areas of inquiry. SEA is an international and interdisciplinary not-for-profit expertise network that pursues systematic, integrative and interdisciplinary inquiry into the human-influenced and built environment and its interaction with the natural environment and local ecosystems with the aim to develop alternative approaches to architectural design and sustainability. From 2007 to 2012 he was board member of BIONIS – The Biomimetics Network for Industrial Sustainability.

From 1993 to 2009 he taught at the Architectural Association School of Architecture in London, where he co-initiated and co-directed the Emergent Technologies and Design Program from 2001 to 2009. He held numerous visiting professorships and innovation fellowships and taught and lectured in Europe, the Americas, Asia and Australia. In his academic work he integrates research and education with a strong emphasis on interdisciplinarity, critical ability and projective capacity.

His writings have been published in Chinese, Czech, English, Estonian, Farsi, Finnish, French, German, Japanese, Korean, Norwegian, Spanish, and Turkish. He has authored, co-authored and edited numerous books and journals.

Sabine Junginger
Systemic Design Approaches in the Public Sector: Are we ready?

The complexities of designing are well known to policy makers who develop policies and public managers who implement policies through public services. So overwhelming is the intricate web of laws, rules, and regulations in a highly hierarchical and political landscape that those working under intense time pressure rarely get time to reflect on their design approaches. With the advent of new global and regional challenges that further increase the complex nature of their task, the principles, practices, processes and methods of design employed in the public sector are moving to centre stage in the effort to arrive at innovative and desirable outcomes. In this talk, I I discuss some of the pitfalls of designing in the public sector and point out why the shift in designerly thinking and doing in the service of public sector innovation presents a challenge for the field of design.

Sabine Junginger bio:

Sabine Junginger currently heads the Competence Center for Research into Design and Management at Lucerne University of Applied Sciences and Arts in Switzerland. She is a Research Fellow of the Hertie School of Governance (Germany), an academic advisor to the European Forum Alpbach (Austria) and the UK Design Council (DfE). She has worked as a senior design expert for the EU-Brazil Sectorial Dialogues and advises several government level public innovation labs on human-centered design. She was a founding member of ImaginationLancaster at Lancaster University (UK) and holds a PhD in Design from Carnegie Mellon University (USA).

Her work appeared in Design Issues, The Design Journal and the Journal for Business Strategy. She is co-editor of Designing Business and Management (Bloomsbury 2016); Highways and Byways to Innovation (University of Southern Denmark/Design School Kolding 2014) and The Handbook of Design Management (Bloomsbury 2011). She is author of Transforming Public Services by Design: Re-Orienting Policies, Organizations and Services around People (Routledge, UK, 2017).

Lucy Kimbell
From Transformation Design to Translation Design

All designing is already about systems, even if the object-focus of traditional design practices has obscured this. With recent developments in the field such as service design, design for social innovation and design for policy, the need for designers to engage more seriously with the systemic nature of designing is acute. This talk will explore the issues arising when contemporary designerly approaches attempt to address systemic challenges. While such approaches offer some potential benefits, they also bring with then assumptions and elisions which are worrying. A shift to designing for translations between worlds, rather than transformations of worlds, may help address these weaknesses.

Lucy Kimbell bio:

Lucy is an experienced researcher, postgraduate educator, and strategic design consultant. She has spent much of her career on design's fringes, intersecting with other disciplines and contexts including social innovation and policy. Lucy has been involved in research, teaching and assessment within leading international universities for over a decade, with a particular focus on the role of design in society, services and innovation. Her leadership and facilitation skills are complemented by research in design thinking and service design and art experiments in visualising data.

Before joining UAL Lucy was AHRC research fellow in Policy Lab in the Cabinet Office (2014-15) and principal research fellow at the University of Brighton where in addition she jointly led projects for the AHRC around social design. Previously Lucy was Clark fellow in design leadership at Said Business School, University of Oxford for five years, where she remains an associate fellow. Lucy co-founded one of the UK's first digital arts groups and went on to work in digital innovation consultancy before joining academia.

As an educator, she has been involved in developing the joint MBA between CSM and Birkbeck College and UAL's executive training offer. She's taught an MBA elective on design innovation at Said Business School, University of Oxford, since 2005. Lucy also designs and delivers training in people-centred design for the UK Civil Service.

Plenary speeches

In memory of Ranjan: The NID approach to Systemic Design
Praveen Nahar

Wednesday 14:30

"Design is human intentions and actions that create new value" – M.P. Ranjan

With its large population and enormous socio-cultural-economic-environmental diversity, India is like a microcosm for the world. Most of the challenges that the world faces, are all present in India. Design education has been addressing tactical and creative level however it became imperative for designers in India to explore vision led design approaches which address diversity and complexity. They had to understand design from a broader and deeper perspective, which is at systems level.

At National Institute of Design we have been exploring various concepts and concerns of System Design from macro to micro perspective on design in local and global context and prepare students to deal with fair amount of ambiguity and complexity. This is delivered through various courses and projects. Over the last decade it has evolved and now major projects deals with complex issues and wicked problems from socio-cultural-economic-environmental perspective with high level of ambiguity, uncertainty and complexity through various intermediate tools and frameworks. The educational framework for systems design is reflective, evolving, transdisciplinary, and occurs at various levels. This has been every enriching for the students as well as for faculty and the institute as a whole to open up to vastness of design and what design can do in almost any field.

Democracy for All – Inclusive design in practice:
Onny Eikhaug and Tom Vavik

Thursday 10:15

A people-centred strategy for innovation and participation – benefiting society, business and the individual.

Onny Eikhaug

Inclusive design, also known as universal design, is defined as the design of products and environments in such a way that they can be used by all people, to the greatest extent possible, without the need for adaptation or specialised design.

Inclusive design is a philosophy, a strategy and a practice. In Norway, it has developed based on our ideas of equality and inclusion. The Norwegian model of social governance, also labelled the Nordic Model, goes beyond the provision of basic needs to protect human rights, focusing on social and democratic ambitions.

For nearly two decades, inclusive design has been a government focus, aiming for a society where every citizen can participate on equal terms. This might be a utopia but it is setting a direction and by cross-section collaboration committing 16 ministries to achieve milestones as set in the first Government Action Plan for Universal Design already in 2005. A lot has been achieved since, based on new legislation and a top down – bottom up approach, involving local government and municipalities as well. It started with establishing legislation, with several acts and regulations that has been amended in key areas such as transport, built environment, buildings, employment and ICT.

Now the third action plan is running until 2019 focusing on digitalisation, technology and a follow up on long-term projects and milestones towards 2025. This is part of the government strategy for sustainability; benefitting society, business and the individual.

To ensure citizen participation and equal opportunities across all areas of society, inclusive design is the strategy to achieve this, putting people at the centre of the process when developing products, services and environments. Human diversity is key, and goes far beyond age, gender and disability, to include sexual orientation, ethnicity, cultural and social background to mention a few. Using various tools and methods for involving users and stake holders within the design and development process is becoming a more successful and proven way of engaging with people.

Inclusive Design brings the perspective of real people to a problem and inspires a multitude of viewpoints and unexpected insights. The resulting solutions can therefore be more creative, innovative and user-friendly, bringing new thinking to familiar challenges within business and public sector, and in that way, contribute to a better and more inclusive society. These tools and methods are applicable also when developing more inclusive, people friendly cities; but urban planning take-up of the approach is still at an early stage.

The Innovation for All programme at DOGA is one of the many measures in the Government Action Plan and has since 2005 been focusing on promoting inclusive design as an effective strategy for innovation. Main activities are knowledge transfer and competence building besides conducting pilot projects with enterprises in public and private sector.

This presentation will look at the historic background, how government, trade and industry together with design and architecture are the drivers for a more inclusive and democratic society. A few Norwegian cases will be included.

Teaching for democracy in a holistic perspective

Tom Vavik

This presentation describes and reflects on how teaching the concept of Universal Design (UD) to design students has developed the last decade at the Institute of Design at the Oslo School of Architecture and Design (AHO). Four main changes are described. Firstly, the curriculum has evolved from teaching UD guidelines and principles to focusing on an inclusive design process. Secondly, an increased emphasis is put on cognitive accessibility and multisensorial interactions. Thirdly, the teaching of UD has moved from second to the first-year curriculum. Fourthly, an increased focus is put on non-stigmatizing aesthetics expressions. The presentation will focus on the basic values and principles for these changes and argue why they are necessary and important. Some future challenges will be presented at the end, asking the following questions: Cultural sustainability – how to ensure cultural heritage, belonging and identity? What about the marginalized and excluded groups of today?

References

Innovating with people – The Business of Inclusive Design, Onny Eikhaug

Inclusive Buildings, Products and Services, Tom Vavik

Design Beyond Design.
Kees Dorst

Thursday 14:30

There is a fundamental shift in the types of problems that practitioners across all professions have to deal with. When we networked ourselves (through the internet, globalisation, etc) we have inadvertently networked our problems, too – we have made them more complex than ever before.

A complex system consists of many elements, with many relationships and interdependencies. These problems have, in their complex interconnected nature, become more like 'infrastructure problems' – but traditionally we have left those very complex systems problems to the Engineers, that tend to optimize the system by technical parameters. That is why we have cities that are optimized for traffic flows, rather than people.

This should surprise us more than it does: it stands to reason that Design should be involved in these big sociotechnical problems, for its crucial ability to combine a Human-Centered/Social perspective with the creation of Technical solutions. Yet Design is not involved at all.

Why?

Could there be something in the very nature of design practices that limits Design's ability to deal with these very complex systems? Does 'design reasoning' not serve us anymore above a certain level of complexity? Or does 'design reasoning' then turn into Engineering, or into a wholly different type of practice that we do not recognize anymore as truly 'designerly'?

In this paper we will interrogate this question deeply, going into logic and the reasoning patterns behind Design, as well as into new and emerging approaches that are currently being developed (in Design practice as well is in Academia) to address the issue of complexity.

Cyberntics, virtue ethics and design.
Ben Sweeting

In this paper I explore the shared ground between considerations of purpose in virtue ethics and cybernetics, drawing on the example of design to bridge between the two. In so doing I connect the conference theme of human flourishing, which is at the heart of virtue ethics, with discourse in cybernetics and design.

The collaboration between Arturo Rosenblueth, Norbert Wiener and Julian Bigelow (1943) was a key part of the origins of cybernetics, dramatically reintroducing the notion of purpose into scientific discourse. Purpose had been replaced by a more mechanistic account of causality because of difficulties associated with the Aristotelian concept of final causes. Early cybernetics bypasses concerns with final causes occurring after the events they cause through its circular understanding of causality (Stewart, 1959/2000). Later, in the discussion following his (1990/2003) influential "Ethics and second-order cybernetics", Heinz von Foerster summarises cybernetics in similar terms:

"…we are all cyberneticians (whether or not we call ourselves such) whenever we justify our actions without using the words "because of…,"or "à cause de…," but with the phrase in English "in order to…," which in French is much more Aristotelian, "à fin de…" " (p. 298).

Considering Rosenblueth et al.'s paper from a design perspective brings out additional complexity. The examples that Rosenblueth et al. cite as non-purposeful (a clock, a roulette wheel, a gun), while not exhibiting "intrinsic purposeful behaviour" (p. 19) in the same way as a servo-mechanism, can be said to be a purpose in themselves (the goal of their designing and making) and can also be used purposefully. These and other considerations were also raised in exchanges with the philosopher Richard Taylor (Rosenblueth & Wiener, 1950; Taylor, 1950a, 1950b), whose critique anticipates the development of cybernetics in terms of what Andrew Pickering has described as a "forward looking search" (Pickering, 2010).

Taylor was later an advocate of virtue ethics. Much like cybernetics had reintroduced the notion of purpose into scientific discourse, challenging the mechanistic accounts of causality that had been favoured since the enlightenment, so too the modern revival of virtue ethics, instigated by G.E.M. Anscombe (1958) and developed by Alasdair Macintyre (1981/1985, 1988) and others, sought to challenge the similarly mechanistic ethical theories of consequentialism and deontology with reference to the Aristotelian tradition.

Cybernetics and virtue ethics have had little if any explicit exchange. There are a number of areas in which they may contribute to or provide useful critiques of each other:

• Differentiating the pursuit of external goals from internal ones distinguishes between virtue ethics and consequentialism, and between cybernetic notions of purposefulness and the instrumental "command and control" agenda with which it has sometimes become confused.
• MacIntyre's discussion of social practices with internal goals, which is a central but underdeveloped part of his (1981/1985) account, can be clarified through cybernetic ideas (Sweeting, 2015a). In turn, MacIntyre's emphasis on internal goals complements second-order cybernetics' concerns with the inclusion of observers.
• Both virtue ethics and cybernetics are concerned with unspecified and changing goals—with what Pickering (2010) called a "forward looking search" and MacIntyre (1981/1985) characterised as a "quest". MacIntyre's (1981/1985) definition of the good life—"the good life for man is the life spent in seeking for the good life for man"—may find support in cybernetic understanding of circularity, self-reference and reflexivity.
• While the most significant contributions to ethical discourse from cybernetics (e.g. Glanville, 2004/2009; von Foerster, 1990/2003) do not refer to virtue ethics, they can be understood as similarly oriented towards the ethical qualities (virtues) of participants (e.g. responsibility, listening) rather than the rightness or wrongness of particular actions.

I explore each of these points of exchange by understanding them in the context of design, drawing on Glanville's (2007) understanding of the close parallels between design and cybernetics and Nicholas Negroponte's (1970, p. 119) identification of the good life (human flourishing), and so design, as in conflict with processes such as optimisation. As well as helping develop an account of ethics that is compatible with designerly thinking (Jonas, 2006)—as opposed to the difficulty of applying deontological and consequentialist approaches in design (Sweeting, 2015b)—I propose that design activity may be drawn on for examples of how such ethical qualities can be pursued in complex and ethically charged circumstances more generally.

References
Anscombe, G. E. M. (1958). Modern moral philosophy. Philosophy, 33(124), 1-19. doi: 10.1017/S0031819100037943
Glanville, R. (2007). Try again. Fail again. Fail better: The cybernetics in design and the design in cybernetics. Kybernetes, 36(9/10), 1173-1206. doi: 10.1108/03684920710827238
Glanville, R. (2009). A (cybernetic) musing: Desirable ethics. In The black boox, volume III: 39 steps (pp. 293-303). Vienna: Edition Echoraum. (Reprinted from: Cybernetics and Human Knowing, 11(2), 77-88, 2004).
Jonas, W. (2006). A Special Moral Code for Design? Design Philosophy Papers, 4(2), 117-132.

doi: 10.2752/144871306X13966268131596

MacIntyre, A. (1985). After virtue: A study in moral theory (2nd corrected ed.). London: Duckworth. (Original work published: 1981).

MacIntyre, A. (1988). Whose justice? Which rationality? London: Duckworth.

Negroponte, N. (1970). The architecture machine. Cambridge, MA: MIT Press.

Pickering, A. (2010). The cybernetic brain: Sketches of another future. Chicago, IL: University of Chicago Press.

Rosenblueth, A., & Wiener, N. (1950). Purposeful and non-purposeful behavior. Philosophy of Science, 17(4), 318-326.

Rosenblueth, A., Wiener, N., & Bigelow, J. (1943). Behavior, purpose and teleology. Philosophy of Science, 10(1), 18-24.

Stewart, D. J. (2000). An essay on the origins of cybernetics. [Originally part of PhD thesis, University of Bristol, Bristol, 1959]. Retrieved from http://www.hfr.org.uk/cybernetics-pages/origins.htm

Sweeting, B. (2015a). Cybernetics of practice. Kybernetes, 44(8/9), 1397-1405. doi: 10.1108/K-11-2014-0239

Sweeting, B. (2015b). The implicit ethics of designing. In A. Ryan & P. Jones (Eds.), Proceedings of Relating Systems Thinking and Design (RSD4) 2015 Symposium. 1-3 September.

Taylor, R. (1950a). Comments on a mechanistic conception of purposefulness. Philosophy of Science, 17(4), 310-317.

Taylor, R. (1950b). Purposeful and non-purposeful behavior: A rejoinder. Philosophy of Science, 17(4), 327-332.

von Foerster, H. (2003). Ethics and second-order cybernetics. In Understanding understanding: Essays on cybernetics and cognition (pp. 287-304). New York, NY: Springer-Verlag.

The Visual Representation of Complex Systems: A Typology of Visual Codes for Systemic Relations.
Joanna Boehnert

Friday 14:30

Sustainability practitioners have long relied on the use of images to display relationships in complex adaptive systems on various scales and across different domains. Visual representations play an important role in facilitating communication, learning and collaboration on social, environmental and economic issues that are characterised as complex systems. This research addresses the need for more effective visual representations of the key features of complexity. With the creation of 'A Typology of Visual Codes for Systemic Relations' the project will address the need for images that are widely understood across different fields and sectors in order to facilitate conversations and decisions making between researchers, policy makers, practitioners and evaluators (with varying degrees of familiarity with complexity science). By

attempting to identify the best visual practices and standardise visual codes used to represent some of the key features of complex systems (such as tipping points; thresholds;   domains of relative stability; levers; hubs; t ime-dependent evolution; feedback loops; emergence and self-organisation;   adaptation, unpredictability / unknowns; structural attractor; path and path dependency; distributed control; domains of stability; systems of systems) this project will contribute to the evolving the visual language used to communicate complexity. Ultimately this short research project aims to support learning as a basis for informed decision-making at the Centre for the Evaluation of Complexity Across the Nexus (CECAN) and other communities engaged with the analysis of complex problems.

Democracy, Participation and design

Designing more democratically, deliberating more systemically: A conversation between Systemic Design and Democratic Deliberation
David Kahane and Alex Ryan

Systemic Design
Democratic Deliberation
Civic Involvement
Democracy
Energy Systems
Climate Change

Systemic design is a practice for innovating in extremely complex situations. One of the authors recently implemented a systemic design approach to develop a 30 year energy strategy for the Government of Alberta, which has the third largest proven oil reserves in the world. The future of energy development and energy use in a province of 4 million people is not only complex, it is political. Democratic deliberation is a field of theory and practice aimed at improving political decision making and action by engaging diverse citizens. It emphasizes the norm that what touches all should be decided by all, uses mechanisms of selection and representation that reflect this norm, and works with a broad repertoire of method for designing and facilitating group processes. The other author convened the Alberta Climate Dialogue (ABCD), a place for citizens to pool diverse perspectives, weigh trade-offs, and set goals in deliberations that have informed climate action and government climate change policy, including the City of Edmonton's Energy Transition Strategy.

The application of systemic design and democratic deliberation to these two highly complex and entangled challenges of energy and climate prompted the two authors to bring the two fields into conversation and mutual exchange. Seen from the perspective of systemic design, the field of democratic deliberation misses opportunities to engage citizens more deeply in examining and critiquing the systems within which they are embedded. It engages citizens in dialogue, but not in generative co-design and co-production of a more desirable future. Conversely, when seen from the perspective of democratic deliberation, systemic design is elitist, engaging small non-representative groups of participants in decisions that affect millions of lives. With its emphasis on prototyping early and often, systemic design can be fast and loose on propositional argumentation and validation, making it difficult to justify why particular ideas were selected over others.

This conversation resulted in framing two questions with the potential to advance both fields:
* How can we make systemic design more democratic?

* How can we make democratic deliberation more systemic?
In September 2016, the authors helped to convene a small group of leading international practitioners of democratic deliberation and systemic design to address these two questions over a three day retreat at Brew Creek. The retreat examined both the practical and axiological compatibility of the two fields. It included a sharing and mashing up of the toolsets of the two fields as a response to the two convening questions. Three teams were then formed to develop a synthesized approach to the challenge of designing a multi-stakeholder design lab to engage stakeholders and citizens on energy futures in Alberta. This provided a concrete vehicle for testing how to design more democratically and deliberate more systemically. In this paper, we share some of the progress made during the retreat as well as open questions that remain important for us to engage.

Nova Agora: How an online platform deconstructs policy disputes to inform deliberative democracy
Natalija Fisher and Jenny Whyte

Wednesday 11:30. Room A1.

Polarized discourse
Generative conversation
Deliberative democracy
Digital peace building
Flourishing democratic societies

The art of discourse is being lost. Policy controversies, such as debates on abortion and immigration, have become intractable disputes. The more positions polarize, the more a simple policy dispute moves towards policy conflict and ruptured public discourse. The 2016 American election is a prime example of polarized policy discourse which follows an upward trend of populist outcomes in Europe i.e. Brexit. A lack of diversity or mobility, filter bubbles and targeted advertising amplify polarization through feedback loops.

Nova Agora is platform that deconstructs policy disputes by reframing how issues are expressed and interpreted, from positions to values, thereby facilitating connection, catharsis, and understanding. It provides a platform for deliberative democracy with a digital meeting place for people to be heard, to build empathy, and to transform.

The tool will be developed in two phases. Phase one will allow users to explore and share linked positions and values. Phase two will allow people to connect online over shared visions and values. The platform can be viewed at https://novagora.co

Design With / For Now
Niloufar Gharavi

Wednesday 12:00. Room A1.

Refugees
desgin students
unemployment
humanitarian
design schools

Figures from the UNHCR (2015), revealed that in the first six months of 2015, 137,000 refugees and migrants attempted to enter the EU, a rise of %83 on the same period in 2014.
As the UNHCR, notes this has placed enormous pressure on the European country's infrastructure and made it increasingly difficult for refugees to access, work, shelter and education. On the other hand, the problem of refugees' unemployment puts lots of pressure on the host countries to provide their everyday needs, despite them being capable of doing it themselves. Consequently, finding solutions to activate their wasting capacities and potentials is a demanding field to look into.
Therefore, this project aims to explore how design qualities and approaches could be applied to the specific context of refugee camps and how it could improve the everyday life of the facilities' inhabitants. In particular, it intends to investigate how collaborative making and handcraft activities could be used as a way to bring together diverse actors, especially the refugees and design students, within camps and encourage them put into play their personal abilities in designing and building products for the camps.
As a collaboration among humanitarians and design schools, project is formed to benefit from the inclusive perspectives and tools of co-design and system oriented design in mapping and structuring the complex data in this field and designing series of workshops upon. In addition, the borrowed approaches from the in-transit studio which already demonstrates the values of such combinations, support the project with extended knowledge and understanding of the field.

Systemic design and social marginalization – Mapping and assessment of projects for the empowerment of people experiencing social exclusion
Giada Pezzi, Marco D'Urzo and Cristian Campagnaro

Wednesday 15:30. Room A1.

social marginality
social exclusion
design for social innovation
wicked problems
capabilities approach

This paper presents an application of the systemic approach for the mapping of projects that address the issue of social marginalization seen as object involved in the process of participation, social cohesion and economic development.

The concept of marginality refers to an organization of society characterized by inequality in which some individuals are not integrated within the system, have little access to resources, and are unable to build strong social ties. For individuals, this condition is a situation close or equal to social exclusion. According to the definition of the sociologist Z. Bauman, who introduced the concept of "human waste" (Bauman, 2003) the marginal subject may be identified as unusable by society and thus relegated to its margins, like any other inanimate material waste meant for the landfill.

In accordance with the Capabilities Approach developed by A. Sen and M. Nussbaum, for a person to be able to deeply express his/her existence, he/she must be recognized in their full complexity, with respect to both needs and potential. In this sense, anyone who is in a position to completely live one's life and exercise their agency, is a resource not only for oneself but for society as a whole. This shows that people who are socially excluded may become key for the activation of virtuous processes both at individual and collective level.

Starting from this view on marginality, we analysed how the fundamental principles of Systemic Design (Bistagnino, 2009; Jones, 2014) in the context of the approach to complex problems (Buchanan, 1992) can be an effective tool to investigate the issue of social exclusion and its possible solutions.

In fact, Systemic Design highlights the distinctive features of the natural processes according to which there is no such thing as waste: any waste (output) within a system becomes a resource (input) of another system, starting new virtuous processes (Bistagnino, 2009). Similarly, an individual placed on the margins of society, from our point of view must be seen as a person full of resources and potential, whose abilities, skills, characteristics can be rehabilitated and positively reinserted into the community, instead of considering him/her as an "unnecessary, useless and unwanted person" (Bauman, 2003).

The study was conducted through a desk review and the subsequent mapping of projects confronting social marginalization. While defining the specific field of research, we focused on today's increasingly solid relationship between precarious and atypical working conditions and the creation of marginality. This relationship has led us to identify, as the field of analysis, the issue of poverty resulting from chronic unemployment or job precariousness within the European context. In this field, we looked for experiences that, beyond their specific purpose, could represent a starting point for the development of new community policies addressing social marginalization.

We have therefore defined an analysis tool to highlight the impact of the projects on their contexts and also to enable a comparison between the different cases studied. It allowed us to: •Map (tangible and intangible) flows and the nature of relationships generated by the

projects. The mapping exercise involved both the marginalized individual's point of view and that of the community in which the project is developed. Throughout the whole process, we highlighted the connections between material culture, social fabric and the production and environmental characterization of the territory. •Identify those factors that allow the project to develop and remain self-sustainable from a social, environmental and economic perspective. Relatedly, determine factors that allow marginalized subjects to develop tangible and intangible resources that support the ability to attain self-sustainability during and after the participation in the project. •Evaluate the connections that the project activates within the territory, while particularly highlighting to which extent and how the characteristics of the context have determined the orientation of the project and, conversely, to which extent and how the project has affected these characteristics. •Evaluate the project's ability to enhance the specific characteristics of those involved, to provide them with new skills and knowledge and to reintegrate them into society, allowing them to express themselves in their whole being. Additionally, assess the social, economic and environmental impact of the project on the community. The characterisation of the project outcome was also analysed for each project, with reference to the four design domains identified by Jones and van Patter (2009). These four are defined as "design for the creation of:"
• Artefacts and communication
• Products and services
• Organizational transformations
• Social transformations Within such analysis, the role played by the designer in the different project phases was highlighted, defining the level in which his/her competence has intervened in conceptual, organizational or productive terms.

In conclusion, we observed how systemic design could represent an approach that enables a holistic view of the projects analysed, by allowing to a comprehensive elaboration of their complexity related to the involved individual and to the context within which the project is developed; generating an exhaustive insight into the whole process.

Who participates in participatory research and innovation? Requirements, motivating factors and expectations with regard to design-driven participatory approaches in agenda-setting processes.
Marie Lena Heidingsfelder, Florian Schütz and Martina Schraudner.

Wednesday 16:00. Room A1.

Interdisciplinary research
public engagement
participatory agenda-setting
participatory design

empirical social research

Technology and society are intertwined, mutually dependent, co-evolutive and co-constructive. Involving societal actors in the development and the design of new technologies and new "socio-technical systems" (Ropohl, 1979) is thus a fundamental task and challenge in democratic societies. The current speed of technological advancement and the transformative potential of new and emerging technologies reveal the relevance of public input and the necessity for the development of new methods of public engagement (e.g. Jørgensen et al., 2009; Loveridge and Saritas, 2009). In response, international research funding agencies have increasingly prioritised projects that promote social responsibility and encourage participation of the public in research and development (National Science Foundation, 2008; European Commission, 2011, 2013).

In this context, methods from participatory design can be used to integrate laypersons into the otherwise mainly expert-driven process of technology agenda-setting (Heidingsfelder et al., 2016) They encourage public reflection on potential ramifications of technological advances and equip social actors to fulfil a more fundamental role in the entire technology development process.

Based on these assumptions, we realized a research project – Shaping Future – that aims at fostering public engagement in research and innovation. The main purpose was to enable laypersons to articulate their needs and expectations with regard to technological advances and to utilise their input in research-planning and agenda-setting processes. The project was realised and evaluated in an interdisciplinary team of designers and social scientists and included methods and techniques from both disciplines (such as storytelling, material speculation or prototyping from design research as well as quantitative and qualitative analyses).

To address one particularly interesting aspect of democratic participation and policy innovation, our contribution will focus on the evaluation of fifty interviews with laypersons who participated in our project. What factors motivated them to bring in their perspectives? How did they experience the use of different design methods? Which requirements are important for participatory processes? And what kind of impact do they expect? To answer these questions, we conducted a qualitative content analysis (Mayring 2010) and identified different types of participants.

References

European Commission (EC) (2011), The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Horizon 2020 – The Framework Programme for Research and Innovation, Brussels.

European Commission (EC) (2013), Options for Strengthening Responsible Research and Innovation: Report of the Expert Group on the State of Art in Europe on Responsible Research and Innovation, Brussels.

Heidingsfelder, M.L., Schütz, F. and Kaiser, S. (2016), Expanding participation participatory design in technology agenda-setting, PDC 2016 Aarhus, Denmark.

Jørgensen, M.S., Jørgensen, U. and Clausen, C. (2009), The social shaping approach to technology foresight, Futures, Vol. 41 No. 2, pp. 80–86.

Loveridge, D. and Saritas, O. (2009), Reducing the democratic deficit in institutional foresight programmes: A case for critical systems thinking in nanotechnology, Technological Forecasting & Social Change, Vol. 76 No. 9, pp. 1208–1221.

Mayring, P. (2010), Qualitative Inhaltsanalyse. Grundlagen und Techniken, Beltz, Weinheim.

National Science Foundation (NSF) (2008), Broadening Participation at the National Science Foundation: A Framework for Action.

Ropohl, G. (1979), Eine Systemtheorie der Technik: Zur Grundlegung der Allgemeinen Technologie, Suhrkamp, Frankfurt a. M.

Designing for Civic Conversations
Michael Arnold Mages

Wednesday 16:30. Room A1.

democracy
deliberation
feedback
material interventions

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 infected the discourse of several major governments in Europe and the Americas. In spite of this concerning 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 reasons and come to conclusions (Fishkin, Luskin 2005). Yet, the production of civic engagement events frequently neglects the influence of the system of stakeholders, and the power of material interventions in facilitating deliberative conversation. Civic conversation is a key precursor to civic change, and successful civic change requires 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.

There is an ongoing tension between the ideals of argumentation and commitment-making. Jeff Conklin (2006), following Horst Rittel (Rittel, Webber, 1973), has developed an understanding of the political conversation as mappable argument. Terry Winograd, Fernando Flores (1986) and Hugh Dubberly with Paul Pangaro (2009) have examined commitment-making between actors as a designed(able) system and social practice. Further, the challenge to Jurgen Habermas' (1995) consensus-based deliberative democracy by Chantal Mouffe's (2000) agonist democracy – an argument taken up more recently in the design discourse by Carl DiSalvo (2012) – leaves discourse lost in the gulf between the positions of conflict and consensus. However, civic discourse need not be framed as arguments, commitment-making, consensus-building or contestation. Looking to newer models of political discourse, protocol-structured conversation (Cavalier, 2011) deliberative community polling (Fishkin, Luskin 2005) and storytelling (Young, 2000) point to this fertile middle ground. The challenge of a contemporary design practitioner designing civic discourse is to create a conversation that evokes the richness of the lived experience of the participants, while maintaining a reflective distance such that participants are able to share their present needs, their hopes for the future, what they feel is the narrative that supports the positions that they hold. The civic participation event is the point where some of that richness can pass into the polity.

Citizens involvement in civic life, and their ability to articulate need (Max-Neef et al., 1991) in a way that can inform policy creation is influenced by their experiences with organizations that are more a part of their everyday life than the more abstract construction of 'government'. The needs of citizens are aggregated, focused, filtered and fixed through citizens' involvement in neighborhood associations, community groups, churches, community and economic development corporations, business associations, community based and corporate news organizations, and the views of political agents at all levels. So developed, the individual's understanding of civic life and the articulation of their needs intersect with the capacities of public authorities, public agencies, and government entities that provision for those needs. At the scope of municipal government, marshalling these mid-level actors – the trusted organizations – facilitates access to citizens and helps to ensure those citizens are motivated to participate. This set of complementary processes that influence the formation of attitudes, values, beliefs and policy are a dynamic system, and these event-based participations are a critical point of feedback within that system.

This presentation will detail a set of three related case studies implementing an iterative approach to developing a design framework for deliberative community engagements through the lens of a model that I have developed: the high-stakes conversation. In the ground between the agonist approach of contestation or the approach of deliberative consensus, these engagements rely on deliberative techniques — structured protocols, prompts for reason-giving, storytelling, and conversation — and material interventions to support behaviors: planning, convening, orienting, informing, conversing, conflicting, reflecting, deciding. These

engagements attempt to evoke a spectrum of thought that characterizes the convened communities' thinking on a particular issue. Rather than treat the issues as disconnected from the network of community organizations, participation was actively sought in the framing of the issues from a wide network of community organizations, and organizers relied upon these organizations as partners throughout the process. Further, in an unintended consequence and beyond the scope of the event, this multilevel process has catalyzed further collaborative work in the participating organizations beyond the creation of the forums.

These case studies examine the following projects through a reflective account of practice as a designer and the convening agent of these engagements. MyVA Communities is a collaboration between the United States Veterans Administration and a regional board of directors tasked to assess veteran's needs in Southwestern Pennsylvania, develop a plan to increase coordination among the region's nearly 1300 charitable organizations providing veteran's services, and increase the sense of connectedness between veterans and their communities. Nearly 30 organizations were involved, with 16 contributing resources and viewpoints. The Environmental Charter School convened staff, faculty and administration in a deliberative engagement to redesign their compensation system. The Environmental Charter school engaged people at every level of their organization, as well as Human Resources and Social Justice scholars at two regional universities, and several local and national not-for-profit organizations. The City of Pittsburgh's Affordable Housing Task Force convened citizens to determine where areas of greatest need were within the city, and what solutions citizens wanted to see in their neighborhoods. Participants included city council members, and representatives from 22 area businesses and not-for-profit organizations.

Cavalier, R. (2011). The Conversational Turn in Political Philosophy. In Approaching Deliberative Democracy: theory and practice (1st ed., pp. 9–29). Pittsburgh, PA: Carnegie Mellon University Press.

Conklin, J. (2006). Dialog Mapping. John Wiley & Sons.

Disalvo, C. (2012). Adversarial Design (1st ed.). Cambridge, MA: The MIT Press.

Dubberly, H., & Pangaro, P. (2009). What is conversation? How can we design for effective conversation? Interactions Magazine, 1–9. http://doi.org/10.1145/1551986.1551991

Fishkin, J. S., & Luskin, R. C. (2005). Experimenting with a democratic ideal: Deliberative polling and public opinion. Acta Politica, 40(3), 284–298. https://doi.org/10.1057/palgrave.ap.5500121

Foa, R. S., & Mounk, Y. (2016). The Danger of Deconsolidation: The Democratic Disconnect. Journal of Democracy, 27(3), 5. http://doi.org/10.1353/jod.2016.0049

Habermas, J. (1995). Reconciliation Through the Public use of Reason : Remarks on John Rawls' Political Liberalism. The Journal of Philosophy, 92(3), 109–131. http://doi.org/10.2307/2940842

Max-Neef, M., Hopenhayn, M., & Elizalde, A. (1991). Human Scale Development. Conception, application and further reflections (1st ed.). New York, New York, USA: The Apex Press. Retrieved from http://www.area-net.org/fileadmin/user_upload/papers/Max-neef_Human_Scale_development.pdf

Mouffe, C. (2000). Deliberative Democracy or Agonistic Pluralism? Political Science Series, (72), 17. http://doi.org/10.2307/40971349

Rittel, H., & Webber, M. (1973). Dilemmas in a general theory of planning. Policy Sciences, 4 (December 1969), 155–169. Retrieved from

http://link.springer.com/article/10.1007/BF01405730

Winograd, T., & Flores, F. (1986). Understanding Computers & Cognition. Norwood, New Jersey: Ablex Publishing Corporation.

Young, I. M. (2000). Inclusion and Democracy. (W. Kymlicka, D. Miller, & A. Ryan, Eds.) (1st ed.). New York: Oxford University Press Inc.

Public sector and policy design

Designing with municipalities – democracy in practice?
Kristin Støren Wigum

Design as a political request
Innovation in Care
Co-design methodology
Dialogue in System Oriented Design

The health sector in Norway is mainly developed as a common good and public service. These service systems are developed as a response to political decision making and their solution strategies, and the municipality administration is in charge of delivering the public services as requested.

The society demography will change dramatically the next twenty years in the western countries, the population above 80 years old will increase by 50% compared to 2016. This challenge demands for innovative thinking in care structures (Ehrenfeld 2008), political discussions and a prepared administration (Digmann et al, 2012).

Is the organisational structure of public administration actually built to handle these type of development processes? The Norwegian Official Report (Hagen, NOU 2011:11) Innovation in the Care Services, from Ministry of Health and Care Services, predicts that future solutions within care for the elderly will find place in co-operations and partnerships between businesses, public institutions, and volunteer organisations.

The N3 method (Innoco, Sintef, 2014) was developed to help the municipalities in innovative design processes in Norway. This method points to five fundaments (Carlson/Wilmot 2006) for innovation to succeed: 1. Identification of real needs, 2. Solutions that actually meet the needs, 3. A Champion who brings the vision forward, 4. A productive multidisciplinary team built by the champion, 5. Anchored process to stakeholders and the organisations involved. The N3 method underline that if one of these fundaments equal "0" then the innovation process equals zero.

Designing solutions for the public is materializing the visions of the politicians who have been elected by the people. It is therefore a large responsibility. The expenses are common, as well as the use of the time and effort by the employees. In almost ten years The Foundation Joy of Life for the Elderly has worked as an ideal organization with development for municipalities in Norway. The two case studies, the designing and implementation of: A. a new certification system that revitalize the nursing homes in Norway, and B. a service concept offered elderly living at home meeting other elderly and young people weekly, avoiding loneliness and

passivity, are both political requests. They have the same partners, and are run through the same processes, however, turn out very differently in terms of success, so far. The author has participated in both case studies as a system and product designer.

This paper will compare the two projects. How are the designer and the design team depending on co-design in developing the services? The intended effect of co-design is shared responsibility for the final solution, as well as shared ownership to the results. It may seem that the individual motivation for participation in co-designing is closely related to what degree one is the "owner" of the real problem or need. If the design task is too general it is hard to create a clear ownership in the project, and at the same time the experience shows that the participants in the co-designing is not indifferent. The success is depending on the participants seeing a clear benefit and relation to their daily tasks in joining the process. And finally, radical ideas are not necessarily hard to find, however, a new service is not completed as a design project until it has been successfully implemented. A system perspective is therefore crucial (Jones, 2013).

The co-design methodology may be compared to dialogue-methodology (Hannevig,Parker 2014). It challenges and expands everyone's individual view. Maybe an extended dialogue within the municipality can bring an awareness of ownership to the larger design tasks? The future care for the elderly requires that employees and leaders in municipality administration see themselves in a larger context and make the organisational structure more flexible to meet the politicians requests across sectors, owning the challenges together.

References:
Carlson, Curtis Raymond, William W. Wilmot. (2006). Innovation: Five Disciplines of Creating what Customers want. US, New York: Crown Publishing group.

Digmann, Annemette, Kirsten Engholm Jensen and Jens Peter Jensen. (2012). Vi er på vej, Offentlig innovation 2.0.(in Danish only, Eng. trans: We are moving on, Public Innovation 2.0). Gyldendal Business, København, Livonia Print: Lativia. ISSB 978-87-02-12389-0.

Ehrenfeld, John R. (2008). Sustainability by Design – a Subversive Strategy for Transforming our Consumer Strategy. USA: Newhaven and London, Yale University Press.

Hannevig, Lise and Marjorie Parker. (2012). Dialog. En praktisk veilder. (In Norwegian only. transl. Eng.: Dialouge. A guidebook for practice.) Finland, Porvoo: Bookwell OY. ISBN 978-82-92773-50-5

Hagen, Kåre. (2011). Innovation in the Care Services . (Norwegian Offical Report, in Norwegian only) Norway, Oslo: 07 Oslo AS, NOU 2011:11, ISSN 0333-ˇ2306, ISBN 978-ˇ82-ˇ583-ˇ1099-ˇ7.

Innoco, Sintef, (2014, 2017). http://ks-innovation-tool.herokuapp.com

Jones, Peter. (2013). Design for care. Innovating Healthcare Experience. US, New York: Rosenfeld Media. ISBN: 1-933820-23-3

Introducing systemic design to support an Australian Government regulatory agency address complex problems.
Bridget Malcolm

public sector innovation
regulatory innovation
complex problems
system modelling
problem boundaries
problem framing
collaborative innovation

The problems we face today are growing increasingly complex and our current public sector practices are not adequate to manage these challenges (Eggers & Singh 2009; Bason 2014; Bourgon 2008; Mulgan & Albury 2003). Within the context of regulation, agencies are being challenged to move beyond their traditional role of enforcing pre-determined regulations, to being able to identify and address complex problems through the development of unique responses (Sparrow 2008; Organisation for Economic Co-operation and Development 2010). This shifts the role of regulatory agencies from being implementers of regulations to being designers in their own right. The proposed paper builds off the findings from an earlier stage of this research, which was presented at RSD5 and involved a case study to understand the current practice to address complex problems. These findings informed the development of a systemic design intervention which was developed within the regulatory agency context to support the project team to address a second complex problem. Key findings from the implementation of the systemic design intervention include the relevance of system maps to support regulatory staff to identify the nature of the problem beyond individual problem components, the value of collective framing of problems with broader stakeholders within the system and the identification of leverage points to target problem responses.
Case study This research involved two qualitative case studies, which were conducted within an Australian Government regulatory agency over a six-month period.
The research was conducted in line with the Design Research Methodology (Blessing & Chakrabarti 2009) to first understand the nature of the current context so that a design intervention can be prescribed to trial within that context. The first case study involved in-depth research to understand the current regulatory problem-solving practice. Considering the diverse nature of practice, a theoretical framework was constructed to understand and compare these findings. This included the context of the practice, the practitioners, the problem being addressed, the actions taken (including methods, principles, methodologies and paradigms or tacit/implicit knowledge) and the problem response.
The findings the first case study were compared to insights of practice from fields that have been developed specifically to deal with complexity – systems thinking, complexity theory and

systemic design. Methodologies from systems thinking, which encourage practitioners to view the problem as part of an adaptive whole system, were identified as being highly relevant to regulatory

PRACTITIONERS ACTIONS/ ACTIVITIES

Methods

Principles

Methodology

Paradigm

CONTEXT

Complex

Problem

Problem

Response

Tacit/ Implicit Knowledge practice based on the compartmentalised governance systems that regulatory agencies operate within and the increasing complexity of problems they are required to address which exist in complex and dynamic social systems. Four different methodologies from the systemic design field were examined to identify common systemic design principles that provide an alternative way to act against complex problems (from Jones 2014; Ryan 2014; Dorst 2015 and ThinkPlace 2016). The common principles amongst these methodologies were exploring problem framing, exploring human needs, utilising divergent thinking, using open and creative dialogue, applying whole systems thinking and experimentation to test ideas.

The findings of current regulatory practice in case study one were compared against the systemic design principles to identify opportunities for these principles to support the current practice. Based on these insights, a systemic design intervention was developed. This included problem scoping, stakeholder mapping, creating a systems map of the problem space, comparing the problem to indicators of complexity (Snowden & Boone 2007) and two co-design workshops.

Case study two involved the application of the systemic design intervention to support the regulatory agency to address a second complex problem. The researcher and the regulatory agency project team applied the initial activities in the design intervention. The researcher and managers from the project team also facilitated the co-design workshops, which included participants from four different government agencies involved in the regulation sector where the complex problem had emerged.

The findings from case study two revealed an enthusiasm for the systemic design methods, with indications that the inclusion of systems thinking and complexity theory methods and principles increased the perceived seriousness of the design approach which was appropriate within the government setting. A stakeholder journey / ecosystem map was developed with the workshop participants which highlighted the complexity of the current system and enabled staff to see the big picture, stated as "the lid of the jigsaw puzzle" by Interviewee 6. The proposed problem responses identified in the co-design workshops were not significantly different to current reward and punishment approaches, except for the inclusion of collaborative responses which were enabled through the participatory nature of the workshops. This was likely due to the relatively conservative nature of the design approach to meet the criteria of a 'safe experiment' within the regulatory agency. However, the development of collaborative responses with other

agencies in the sector was a significant advancement from the current identified in case study one. Several barriers to the implementation of design within a public sector context were also identified.

Conclusion
This research progresses the understanding of systemic design practice and the opportunities and barriers for implementation within the public sector.
Supporting regulators to innovate around complex problem responses is a novel application of systemic design, but also an important one considering the nature of the regulatory role in managing social and economic problems.

Co-designing cultures within public organizational systems.
Manuela Aguirre, Janey Ro, Paulina Buvinic and Katalina Papic

Wednesday 12:00. Room A2.

systemic design capacity building
co-design as organizational culture
design cultures within social systems
co-designing democracies

How can we create the conditions for public organizational systems to become co-designing cultures? This is the question we are set to explore by comparing two co-design capacity building programs embedded within public and social service organizations in Canada and Chile (Figure 1). In co-designing cultures, the culture of co-design seeks to become deeply rooted within the organizational DNA of public service systems as the ongoing capacity to co-design by including all those who serve, are served, and are affected by a social system (Banathy, 1996). A cultural approach towards organizational co-design is different from using co-design as instrumental means (e.g. designing better public services) or as symbolic means (e.g. gaining institutional legitimacy from its macro organizational environment).

These two co-design capacity building programs can be seen as the 'genesis systems' of a designing community that is formed within complex social systems (Banathy, 1996). As both of these genesis systems are seeding co-designing sub-cultures within a dominant public organizational culture, we will use Schein's model of organizational culture to unpack the relationship between an organization's dominant culture and its emerging sub-culture. According to organizational psychologist Edgar H. Schein (1984; 2010), organizational cultures can be de-constructed into three primary layers: visible artifacts, espoused values, and fundamental values, beliefs and assumptions. Consequently, these three cultural layers can be represented using the onion model, as previously done by designers Sabine Junginger and

Daniela Sangiorgi (2009). In order to compare both programs, we will adapt this three-layered analysis described by Schein.

We can analyze the most outer layer of organizational cultures through visible artifacts. In this case, these visible artifacts will be called: structuring conditions. These are all the physical, normative, social, and symbolic structures that condition the co-design capacity building programs from the outside in. These conditions will be compared (in both programs) through the use of time and space, the formation of cross-collaborative individuals or teams, the sequencing of co-design processes, and the program's institutional legitimacy (Figure 2).

The second layer of analysis is what Schein (2010) calls espoused values. This is how we rationalize fundamental values – as fundamental beliefs not always correlate to how those beliefs get manifested. For the purpose of this analysis, we will call this middle layer: practice experiences. The mechanism that affect how the capacity building program translates into new practices and experiences include: role expectations and socialization, outputs and outcomes, learning from feedback, and adoption and translation (Figure 3).

Finally, the most inner layer of organizational culture is fundamental values, beliefs and assumptions. In both cases, these will be compared in terms of: values and beliefs, identity, reflection, and mindsets and worldviews (Figure 4).

The purpose of analyzing co-design capacity building programs in relation to organizational cultures lies in the connection of building robust and resilient co-designing communities, which can develop their unique co-designing values and identity. This is the first step towards Bela Banathy's vision (1996) of creating co-designing communities that have the capacity to design and redesign their own lives and societies – and not be slaved within systems created by others.

"Getting ready for design and developing a design culture is individual and collective empowerment at its most robust. Such empowerment gives meaning and substance to guiding our future" (Banathy, 1996, p. 282).

For Banathy, transforming social systems into co-designing cultures may enable individual and collective empowerment, which is a form of creating co-designing democracies.

References:

Banathy, B. H. (1996). Designing social systems in a changing world. (R. L. Flood, Ed.). New York: Plenum Press.

Junginger, S., & Sangiorgi, D. (2009). Service design and organisational change: bridging the gap between rigour and relevance. 3rd IASDR Conference on Design Research, Seoul, Korea.

Schein, E. H. (1984). Coming to a new awareness of organizational culture. Sloan Management Review, 25(2), 3–16.

Schein, E. H. (2010). Organizational culture and leadership (4th ed.). San Francisco: Jossey-Bass, Wiley.

Mind the gap! A Norwegian Trial Incentive Program to stimulate government agencies management resources.
Benedicte Wildhagen and Sissel Kristin Hoel

Public sector innovation
Service design
Systems Oriented Design
Wicked problems
User needs
Policy in practice
Innovation-team
i-team
Triple Diamond
Design tools for policy

Context
The Norwegian public sector is hierarchically structured and is organized in sectors, creating silo management. However, increasing number of challenges cut across levels of government and sectors. In order to make improvements, new solutions are required to bridge the gaps, but this is hampered by inexperience and a lack of skills in how to promote innovation in regulations, procedures and the exercise of authority. All though each agency performs as requested, there is a lack of overall perspective along with incentives to solve challenges in between and across agencies, sectors and levels of government. Globalization, climate crisis and digitalization, along with strained budgets tend to fuel wicked problems. Nonetheless, tighter budget frames have made the priority of main tasks within every agency even more explicit. This is how the compartmentalization of the government administration has developed. But this is not rational for the society as a whole. Many critical challenges are in need of broad systemic improvements combined with a focus on real people's needs, demanding cooperation across several sectors. This is especially challenging in a hierarchical system, like the government administration. No one seems to be the owner of cross-cutting services, but many are responsible for individual pieces within the whole. To disentangle cross-cutting and wicked problems there is a need for innovation. But innovation involves risk-taking and the government administration is risk averse. Government agencies are focused on control and reaching performance goals, while innovation require experimentation, trial and error, courage and curiosity. This is the backdrop for the Ministry of Local Government and Modernization's assignment to Difi to developed a Trial

Incentive Program to strengthen innovative capabilities in the public sector (2016-2017). The program objectives are to stimulate government agencies to use innovative methods, including service design, to develop comprehensive services that are better for the users and provide more efficient use of resources for management. NOK 10 million is to be used during two years, to achieve actual results by the end of 2017. Approach and results

The need for an interdisciplinary approach was evident – both to design the Trial Program, and to identify, qualify and support projects. Difi entered into a partnership with DOGA, another government agency, which possesses design expertise along with experience in public sector innovation. A total of eight projects have received support and funding from the Trial Program. They aim to invent or develop new systems, processes and services, with relentless focus on real people's needs and reduction of management resources. Most projects aim to solve problems across agencies and sectors, and many involve digitalization of services. Management commitment and an organizational potential for innovation have been a prerequisite.

Contrary to what is mainly done internationally, where public Lab's develop and deliver solutions for public actors, we have chosen to utilize the market. In order to ensure that innovative service concepts are implemented, we have pre-qualified ten consortia that offers a competence-triangle; service design is supported by change management and KPI-development and -realization. From this pool, we procure suppliers that meet the needs of each projects. In addition, new competencies are generated among the suppliers, and an overall larger market for suppliers is accessed in the public sector.

It is in no way straightforward to detect connections between cause and effect within complex challenges in public sector, as they tend to consist of many factors along with several gaps and multiple actors, and the relationships between them all might be incomprehensible. As a consequence, we stress the need to make a diagnosis before "describing medicine". Subsequently we have made certain parts of our requests for proposals, less conclusive and far more open than what is customary in a public-sector procurement. We believe supplying the consortiums interdisciplinary competencies at an earlier stage, will shift a typical focus on symptoms and assumptions of what is needed to a broader systemic understanding. The projects are required to spend time to navigate the complexity, to reveal underlying root-causes and needs, as means to identify innovation potential with a focus on real people's needs. Finally, at the end of the initial diagnosis-phase, it should be possible to define a suitable approach by which overall objectives and quality can be achieved, within the framework of change capabilities, time and budget at hand. This is added to the contract.

Based on Difi and DOGA's expertise in public management and -law, procurement, design and public innovation the collaboration has evolved into a per se innovation-team. We have developed both the Trial Incentive Program and the services we provide, in a hands-on, practical, tight and un-bureaucratic manner of working, with emphasis on learning by doing, curiosity, trial and error.

Most of our projects involve several agencies across sectors, representing complex issues. Getting these government agencies coordinated is demanding. The funding has drawn initial attention to the Trial Program, but our main contribution is to mature innovation readiness in

every case, by supplying innovation skills, user perspective and minimizing risk at the preparatory stage.

Conclusion
Many talk about government innovation and cross-sector improvements, but not many do. Our work with the Trial Program will continue testing and experimenting throughout 2017, providing us with concrete examples, various results, diverse new insights and knowledge of:
– how relentless focus on real people's needs and reduction of management resources can result in improved and comprehensive cross-sector public services
– the effect of the competency-triangle of service design, supported by change management and KPI development and realization, to innovate public sector – and why, and if, the application of the competency-triangle is relevant
– what an i-team contributes to public sector innovation, and why it is needed (in Norway)
– how diagnosis and the triple diamond enhance the understanding of underlying root causes, before we explore, define, develop and deliver

Our presentation will be a lecture (ppt-presetentation) with contributions from both Difi and DOGA. The presentation will include concrete examples and results from both the ongoing projects and the program, visualizations, images and videos.

Finding the flex in complex public sector systems. Co-designing for services through systemic interventions.
Heidi Dolven and Adrian Paulsen

Wednesday 16:00. Room A4.

cross sectorial

policy

innovation

This proposed case study offers insight in the use of design across public sector silos toward solving complex issues in regards to joint ownership, administration and policy delivery between ministries, directorates, regional and municipal service delivery. The approach demands horizontal and vertical innovation across these varying levels of government and administrative silos toward reduction in bureaucracy and improved service provision.

In this case study we have worked on improving the process of recalling, retrieving and keeping the right to retain your driving license. As it involves three different sectors and several layers of national, regional and local government the findings have great relevance to others working toward solving similar complex issues across public sector silos and administrative levels. We have been given a mandate to innovate or improve the full set of tools in public administration – from laws and regulations, to financing structures, digitization of work processes, or simply changing forms. The work contributes to the current discourse on design for public sector service by offering insight into ongoing design practice in real life case study.

Due to bureaucratic systems, current public service provision is time consuming for both service provider and citizen. Leading to an increased focus in cutting bureaucracy as well as solving systemic and wicked problems in public sector service management. The Agency for Public Management and eGoverment and The Norwegian Center for Design and Architecture administers the fund for public sector innovation through design (Stimuleringsordningen) on behalf of the The Ministry of Local Government and Modernisation. Within the program this case study has been lifted as the most complex and 'wicked' of of the public sector challenges to be solved through the use of design in combination with change management, KPI development, planning and realization. We are working with Rambøll Consulting on this particular case.

Failings in current service provision might be perceived as merely inconvenient for individual citizens in interaction with the service system, however on a national level it has great impact in regards efficiency and societal costs. Conventional approaches have not resulted in solving these systemic challenges. The case presented offers considerable potential for redesigning the current service toward making the processes more user friendly, resource efficiency and preparing the driver's licence system for potential disruptive scenarios including self driving cars. This case creates new knowledge on the use of design in solving cross sectoral challenges that with growing bureaucracy has developed a complexity which is increasingly hard to solve.

Jocelyn Bailey and Peter Lloyd (2016) argues that design practices challenges important structures and culture in policy making within the UK Government. This case is addressing some of the challenges identified by Bailey and Lloyd in order to develop approaches that are more mindful of existing structures, culture and expectations for analyzing, developing solutions and decision making. The paper contributes to theory and practice by offering insight into the approach. We would like to share from our design process through a critical review of our framework and results.

The four directorates which had joined forces did not have a common understanding of the challenges. Hence it was crucial to create the right environment to allow open conversation, creativity, and exploration of the challenges. These types of settings have been referred to as 'authorizing environments' (Bason, 2013; Christiansen, 2014) and 'public innovation places' (Selloni, Staszowski, Bason, Schneider, & Findeiss, 2013), and as such recognize the importance of the physical and social space needed for public sector innovation. Finally it has been shown that the governance model of many public services is shifting from largely designing around the delivery of services for people towards to designing to enable a better co-production of services

with p eople (Mulgan, 2012, p. 20). With this in mind we have had an explicit aim of co-creating with the project group and developing new knowledge together across bureaucracy and design.

The project was initiated around five main hypothesis on what would be keys to successful change.

1. Identify plasticity* (*where change might occur) within the system, made visible through a systemic understanding of the structures, service flow and dependencies mapped. The inner workings of public sector can be counterintuitive and a thorough understanding of the systemic context is crucial.

2. Dual-language project leadership, applying design-lead project leadership for precise communication and translation. The project team included design practitioners who also have long experience of direct employment within the public sector and on several administrative levels. This offered a level of 'hybrid subjectivity' (Aitkin, 2008 cited in De Propris & Mwaura, 2013, p.4) and acted as a key factor in knowing when and how to use design in order to solve challenges, as well as being able to use bureaucratic terms and logic as the basis when doing sensemaking with design tools.

3. Third key is finding the right level the diagnosis, experimentation and creation of effective interventions that is shared between the sectors/actors involved.
Understanding that the socio-economic framework differs from sector to sector, which causes conflicting points of view when it comes to prioritizing changes. It is vital to create some common perspectives, a culture for accepting opposing views and a willingness to compromise when necessary.

4. The fourth key is bringing in Foresight methodology for the group to develop common ground, as topics are far enough ahead, not owned by a specific sector, with drivers that are universal, holistic and challenge all partners. This final key has already delivered great value with creating a space where current disagreements and past conflicts can be put aside.

5. The fifth key is to combine our systemic design approach with the quantitative approach of "Gevinstrealisering" (KPI development, planning and realization) that Rambøll as a means to provide scale and prioritize points of potential.

At the time of the conference our project will be in the final stage of piloting the first service intervention. Allowing us to present what then will be freshly made experiences around the initial hypotheses, in addition to more refined models and frameworks currently being developed.

References
Bailey, J., & Lloyd, P. (2016). The introduction of design to policymaking: Policy Lab and the UK government.

Bason, C. (2013). Design-led innovation in governments. Stanford Social Innovation Review .
Retrieved from
http://www.ssireview.org/pdf/Spring_2013_Design_Led_Innovation_in_Government.pdf

Christiansen, J. (2014). The irrealities of public innovation . University of Aarhus . University of
Aarhus.

De Propris, L., & Mwaura, S. (2013). Demystifying cultural intermediaries: Who are they, what
do they do
and where can they be found in England?

Mulgan, G. (2012). Government with people: The outlines of a relational state. In G. Cooke & R.
Muir (Eds.),
The relational state: How recognising the importance of human relationships could
revolutionise the role of the state (pp. 20–34). Institute for Public Policy Research.

Selloni, D., Staszowski, E., Bason, C., Schneider, A., & Findeiss, A. (2013). Gov innovation labs:
Constellation 1.0 . New York City. Retrieved from newschool.edu/desis

Design for social change: on new practices and organization models that foster knowledge transfers from design sector elsewhere.
Lyudmila Petrova and Cristian Campagnaro

Wednesday 16:30. Room A4.

social change

social cohesion

homelessness

cultural and social values

spillovers

empowerment

capability approach

Within the context of the "knowledge-based" economy (OECD, 1996), there is a common
understanding that culture, art and design can promote innovation throughout economy and

42

society by providing input to products and services in other sectors. (Throsby, 2001). Scholars of innovation and policymakers are beginning to recognise the critical role of the cultural and creative industries 'spillover' (Potts, 2011; European commission, 2012).

Usually, the notion of the cultural and creative industries "spillovers" is associated with the transfer of economic benefits in terms of contributions to GDP, growth, and employment (O'Hagan, 2016). However, recent analysis of spillovers of these industries invites also to consider their social and cultural contributions to quality of life, integration and cohesion in the society through the realization of knowledge and network spillovers (TFCC, 2015). This goes also along with the acknowledgement of UNESCO and European Union that culture-led creativity is vital to industry, businesses, education and community development.

The diffusion of these practices changes the landscape of innovation very much, by encouraging greater openness and inclusiveness across sectors and disciplines. More than often, the process of transferring knowledge between the design sector and other unrelated sectors is marked by a context of close collaborations, cross-fertilization and mutual learning with creatives (artists, designers, architects, scientists, etc.). In this respect, design has started to be used beyond the object production, but in solving complex business and social problems. Accordingly producing design interventions is a new kind of activity, entailing a multitude of processes such as learning, sharing, creating and experimenting (Manzini, 2015; Verganti, 2009). All these new applications of design suggest dynamic changes in the organizational and institutional models within the design sector and in the way design realises knowledge transfers elsewhere.

Acknowledging these developments, this paper first reveals the practice of design for a social change in the case study of "Costruire Bellezza / Crafting Beauty", a permanent and interdisciplinary laboratory aimed at social cohesion. The case exemplifies the realisation of innovation through knowledge spillovers from the design sector to the social service sector.

The project started in 2014 in Turin, a city which has a long tradition for social innovation. One particular line of development in the city is the system social innovation with the aim to produce a change in the ordinary practices and policies (Ciampolini and Porcellana, 2014). In this context, Costruire Bellezza started as a pilot focused on both the empowerment of homeless people (Sen, 2000) and on the development of skills in university students (Margolin and Margolin, 2002) through participatory and interdisciplinary approaches.

The project is initiated and curated by the architect and designer, Cristian Campagnaro (Department of Architecture and Design of Polytechnic of Turin) and the anthropologist Valentina Porcellana (Department of Philosophy and Educational Science of Turin University) in the framework of an action research about homelessness set up in 2009 (Stefani, 2016).

The rationale of the workshops is to stimulate "beautiful heals" for the homeless through fostering their own creative potential and the experience of relationships with the others (Campagnaro, Porcellana, 2016). The creation of design outputs, that can be product, services or process (Jones, Van Patter, 2009), is seen as lasting outcome just because of the relations they produce and the stories they generate (Bourriaud, 2010). For example, while a designer is focusing to realise his/her intellectual-functional-aesthetic goals, he or she is achieving some social goals by enabling an individual, a non-artist and non-professional, to connect to other people, to experience a sense of belonging and to enhance his or her well-being. One of the goals of the creative interventions, i.e. design workshops about several issues, is to form a strong relationship among all participants and, as such, to provide opportunities for homeless

people to develop or regain personal skills which will further help them achieve independence, get a job and change their status to people with an own home. Another goal is increasing the awareness of citizens and competent professionals about how they can contribute to improve the integration of people with unequal opportunities (Cross, 1982, 2001).

Second, the paper argues that in order design to contribute to systematic and structural changes in other sectors, it takes building a new context, i.e. new organizational structure and linkages with various external stakeholders. In this respect, the paper reveals the organizational and institutional possibilities and challenges which support, or hamper, the interdisciplinary collaboration between professional designers/creatives, design students, anthropologists (researchers and students) and social workers. The paper further discusses, what strategies need to be undertake in order to generate and enhance economic, cultural and social values in a new context and as such generate social changes elsewhere.

Design for The Other Side: Prison Reforms through building resilience.
Surya Teja Bachu, Aravind Ratheesh, Bharat Kashyap, Julia Andreyyeva and Praveen Nahar

Thursday 11:00. Room A2.

Prison Reforms

Co-creation

Systems resilience

Design Thinking

Context

"The Other Side" is an academic applied design research project in the context of Prison and Prison Industries in Ahmedabad, India.

From past few decades we believe that people who commit criminal activity is prisoned and is generally coined as Criminal for rest of his lifetime. This project is about understanding what makes a person to commit crime, to introspect and change society's perspective towards prison system, to transform small scale industries inside prison into creative work spaces through various design practices, to make inmate a creator of things within the time of conviction.

Our mission is to build Prison environment as a place of reformation, a place of transforming mindset of inmates to think creatively through design thinking framework and adapt with socio-economic difficulties as a returning citizen. Idea is also to expose inmates in a creative environment to bring transferable creative skills through co-creation and in long term – better communication, teamwork, conceptual design skills, pragmatic making skills and enterprise skills which will support them to flourish through employment through Central prison of Gujarat

Design methodology

In this applied design research project, understood the prison system holistically to discover the cause of growing crime rate, conducted co-creation workshops to exchange tools and methodologies with prison system which assists inmate to build social resilience and economic growth. Designed a structured methodology to bringsocial and culture cohesion inside prison.

¬
Further analysis through zaltman metaphor process and workshops with inmates, officers helped to understand creative thinking skills, lifestyle in relationship with environment in prison. Analyzing and synthesizing the data aimed at coming up with structural solution to build socio-friendly environment between inmates and society. s

Design Interventions

In the wake of experiencing and directing rehashed visits to the prison, acquired numerous bits of knowledge how the framework functions. What's more was watching the distinction in how the male and femaleinmate's territory, prisoner zone works, every bit of knowledge was distinctive. Attempts to go inside and out, to re-discover association how things functions with respect to others enhanced the scope of intervention.

Through deeper understanding and synthesis of the prison system,through discussions with Criminologists, Exempted Inmates, Psychologists, Lawyers, Journalists, Social Reformers, Educators, Design Advocates,Social Innovators, Students, Police Department and public it was possible to design case studies to facilitate workshops.

Reflection of how certain issues emerge because of absence of appropriate correspondence gained to develop numerous interventions. Additionally mapped the experience we had in the wake of experiencing the procedure and the behavioral changes of the authorities and their constraints. Also, blemishes in the framework.

The workshops were conducted in all possible domains to know the possibilities of co-creation in an unfamiliar setting. Some of the workshops were facilitated rather than conducting ourselves to get the best outcome in a short period of time.

Justice through Reformation

Insights from the research and the workshops, to make the society aware about the reformation of the prisoner and on the other hand to know the perspective of the society, to create a trigger

and create a sensory etching for the same, conducted campaigns through diverse social medium like social platform, Media, Movies, Radio FM, store by inmates in public spaces with JUSTICE THROUGH REFORMATION campaign

Conclusion

With positive welcome & support we are definitely certain that it's possible to come with diverse outputs which supports inmates to build creative thoughts and self-sustain.Creative activities in the prison environmentassists building prison as home for mindful thinking through creating inspirational platform, Building creative workshops to come up with different creative product solutions.

Build Product & Services

Going through creative thought process for the products developed in the prison to associate inmates with the products they develop and it also encourages to come up with different creative solutions and unfold the opportunities of intervention to explore unexplored.

Unfolding Communication Barriers

Constructing a platform where the inmates come closer to each other to understand and share their opinions about their well-being helps them to build a brotherhood feeling. It shouldn't end here, it should be taken ahead to further where there is social platform for peer to peer communication between Inmates, police department and Society.

Create Values for Experience

To organize creative activities, to stand for social cause, to invite social innovators and reformers who like to co-create with inmates for well-being of the society and to market and expand the product scope of the inmates, to provide opportunities to employ inmates and further widen scope through funding for inmates who like to be a creative entrepreneur by banks and social organizations.

This constitutes a democratic system which stands for ONE FOR ALL & ALL FOR ONE.

Systems Thinking based Design intervention for Supporting Healthy Ageing / Ageing in Place.
John Darzentas, Helen Petrie and Jenny Darzentas

Thursday 11:30. Room A2.

Systems Thinking

Service Design

Community based Design

This paper presents an approach based on Systems Thinking to create design interventions, demonstrating its use and potential usefulness in the case of providing support for Healthy Ageing. It attempts to clarify and enforce some important steps in Systems Thinking based Design methods.

The paradigm of Service Design used within the Systems Thinking Design provides a platform for demonstrating its use in design problem spaces such as the case of Healthy Ageing.

The particular problem space is about caring for older people in order to provide support for Ageing in Place i.e. staying at home autonomously. The apparent complexity of such a concern raises issues such as:

The problem

- The larger problem of older people and their needs
- Potential design intervention, which these days is expected to the use of technology to complement or even replace carers in providing assistance
- What really are the services (tasks, procedures) that are needed and desired,

What are the learning curves

- Who are the stakeholders and interested parties
- Where is the onus (on technology and its capabilities)

Fear of loss of control

- Fear of death
- Loss of dignity,
- Ceasing to matter
- Becoming a burden

Systemic design

- how systemic design used to inspire the design of services accommodates large holistic overviews
- offers principles and tenets that can be used to guide and inspire search
- allows for value co-creation
- allows for new perspectives to be created
- aids sharing of perspectives and values.

How to see the Whole (Holon)?

- One way to see as much as possible of a problem space is to co-create participatively a description of it.
- A Rich Picture is a popular approach to represent complex human centred problem spaces. Other approaches such Giga Mapping could be used to capture a Holon of the situation of concern
- For instance, for the concept of "Healthy Ageing" the following Rich Picture has evolved as a Holon.
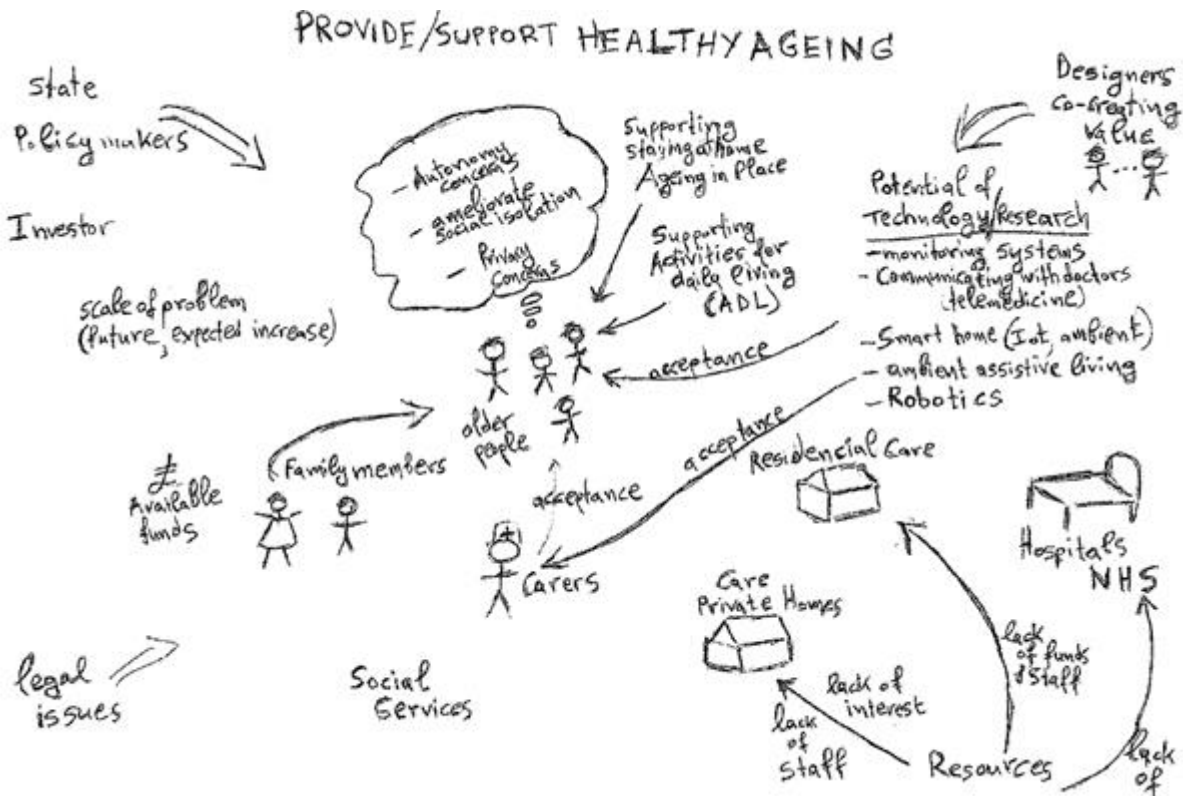
The 'translation' of that Holon to Systems Thinking language has been proposed and achieved in several ways. A discussion of this very important issue will be presented attempting to demonstrate its complexity.

A system is composed of:

- Elements (or parts) (often the most obvious part of a system)
- Interconnections (often the flow of information)
- Functions (functions are the behaviours expected from elements and interconnections) (typically the least understood, and the ones that affect a system profoundly

This 'translation' to Systems Thinking offers the tools of thinking for learning and understanding about the problem space. These tools contain useful notions and tenets such as:

- Complexity
- Emergent properties
- Variety (requisite variety)
- Self reference
- Closed (as far their organisation)
- Open (as far as energy and matter)
- (Autopoiesis)
- (2nd Order Cybernetics)
- (Resilience)

Systems also have:

- Purpose
- Boundary
- Environment
- Subsystems
- Hierarchical structure

As mentioned above the paradigm of Service Design is used to demonstrate the approach, and in this context Product-Service Systems (PSS) can be considered as it is an influential model in the designing of services. It is a model of designing services that characterises the design intervention by considering the product with the service and using both for adding value to the end result.

However, we claim that products should be considered as by-products-of Service Design (Darzentas et al, 2014). This is because:

- the complexity which very usefully characterises the services to be designed is 'damaged' by the assumptions that products associated with those services pre-exist, and are not emerging as part of the design process.
- capturing as much as possible of the design problem space obviously provides a more robust description of it. Imposing a major constraint on the problem space such as the retaining of the product(s) and assuming that, by default, the product is associated to the service, as in the case of PSS's (e.g. servitising) does exactly the 'damage' mentioned above to the manufacturers, the customers and more generally, the stakeholders.

The hypothesis here is that the product(s) are 'by–products' of the service design process.

An example to illustrate the by-product hypothesis:

- The design of an accessible cash card for blind users (Product Design).
- The design of a number of accessible bank services based on the existing accessible cash card for blind users (PSS).
- The design of accessible bank services for blind customers (By-product(s)). These by-products might be an advanced card design and/or again or other accessible means.

In the case of Healthy Ageing a product could have the form of an artifact containing prescription medicine with instructions. A PSS alternative could be the enhancement of the artifact with basic intelligence to remind and guide the user on how to use it.The design of a service to cover the needs of the user in terms of mobility, vision, etc. could be, apart from human assistance, complemented by technology, based for instance, on the use of robots.

Further, in the case of technology-driven services, using robots in 'Healthy Ageing' scenarios raises questions as to how desirable it is to have an application or a robotic agent to remind an older person to take medicine, or to have a robot bring a tablet computer to an older person, so they can use it to order groceries. Perhaps these scenarios are driven more by the abilities of the technology in terms of internet connections and mobility, than real needs. Support may start with the services identified by Healthy Ageing scenarios, e.g. help with lifting, with reaching, with sorting. Then the next step would be to find the 'products' to support those identified services (and these products can be technologies, people or combinations…).

The paper presents the application of a Systems Thinking based design approach in designing services for Healthy Ageing. Tackling the problem leading to a possible intervention, does not mean that the design of services to be implemented should be based on solely the capabilities of technological support, rather they should take a service approach, and then use whatever technological product, for instance robots, that can best deliver the specified services.

Wellness, Flourishing Societies and "Over the Horizon" Innovation of Policy and Policy Implementation.
Sharon Matthias

Flourishing communities

health and population wellness

Sustainable and Flourishing public sector organization

Public sector systems innovation

"Wellness" and "Flourishing Societies" are terms used more and more commonly. But do we mean the same thing when we use the terms? Is there yet a way to weave our different views into a common understanding? What are we learning about their etiology, and how they evolve in persons and ecosystems that can help us be more purposeful about systemic design, systemic implementation and evaluating progress. And how do we know we're taking appropriate action and making progress towards them, whether in individual persons, in populations and in communities and societies?

Such understanding is surely required for us to move from using them as a slogan or aspiration for the distant and unaccountable future, to having the tools and capabilities for co-creating a disciplined outcomes-based strategy and implementation plan.

Learnings from more than 25 years of work and reflection, built on applying research, practice and personal lived experience and iterative learnings to these questions offer some initial conclusions and mental models to support personal and policy implementation that is congruent with wellness and flourishing. The author's persistence has been fueled by a need to understand how to properly implement the policy objective stated in the Yukon Health Act of 1988. In the language of the tine, the act described the policy objective as being to protect, promote and restore Yukoners' physical, emotional, social, mental and spiritual well-being in harmony with their physical, social, economic and cultural environments. Further, the Act's requirements made t near that it was to be implemented in a way that honours both western and indigenous culture and science.

Looking back at the Act now is like living T.S. Eliot's famous poem "We shall not cease from exploration, and at the end of all our exploring will be to arrive where we started and know the place for the first time". Now, armed with the benefit of systemic human and ecological design thinking, it is even more clear just how far ahead of its time the Act was. (In 1988, where would have been the understanding to properly operationalize the principle that "the accountability of

the health and social policy decision-makers and implementors so that health and social policies and the system will be responsive to the needs of the residents of the Yukon"!)

Even with today's level of understanding, and armed with systemic design tools and collaborative processes, it would be an ambitious understanding to implement this innovative policy. But at that time, even with a rudimentary idea of what was intended by "physical, emotional, social, mental and spiritual well-being', it was clear that conventional policy implementation tools and processes, with MBA informed scientific management and organization approaches, were not up to the task. A giant "if not this then what?" dilemma for policy implementation.

The paper describes the concepts of "wellness" and "flourishing societies" through multiple lenses, based on practice experience of public sector systemic innovation and causal layer analysis. It weaves concepts and theories from multiple fields of knowledge associated with wellness and flourishing societies (including human ecology, brain development and neurosciences, positive mental health, cognitive complexity developmental stages, relational competency, family and community health and development, to anthropology, anarchy, anthropology, therapeutic landscapes and organizational sciences), to provide learnings to date, including:

– an integrated sense of what persons' wellness and flourishing societies means, some aspects of their etiology, and the trajectory of development using a capability based whole person whole life whole society learning frame;
-degree of innovation required of policy implementation approaches, and the need for ways to disrupt one's world view and archetypal narrative to achieve 'over the horizon' level of innovation in systemic design and implementation;
-implications for individuals, programs, organizations and systems who aspire to support a person or society to develop to their potential levels of wellbeing and flourishing, with mental tools and practice examples including an Adaptive Organization Canvas, Whole Person and Whole of Society Policy Implementation Frameworks, Systemic Maturity Models and Systemic Learning Evaluations for Policy Implementation innovation, and Population vs Whole System Strategy Frames;
-Putting 'Aging' and 'Flourishing' in the same sentence – offerings for personal actions.

Systemic design towards user-centered sustainability in medical treatments.
Amina Pereno

systemic design

sustainability

environment

patient-centered care

chronic diseases

medical devices

Nowadays, health systems are facing significant societal and organizational challenges that require enhancing their resilience and sustainability. The impressive increase of noncommunicable diseases and long-term care is accelerating the ongoing transition towards a major reorganization of the health systems. A paradigm shift is required to re-balance the relations between health stakeholders: people have to play an active role in their care, changing their behaviors for preventing and managing diseases. We are moving from a provider-led perspective to patient-centered care. This transition is both delicate and complex and demands a holistic and interdisciplinary approach to design products and services that will be used by new caregivers (patients) in new environments (home care). Besides technical and medical innovation, it is crucial to identify the actual needs of people to make them able to understand and use these new products and services. Usability, utility, and acceptability are key criteria to enhance self-care and help patients to cope with the complexity of health care. The approach of design thinking to manage user-focused problems is attracting interest in healthcare stakeholders. Design tools and methods are perceived as useful and valid to bring innovative products and services in health care, starting from the social, cultural, and operational needs of users.

At the same time, health systems are struggling to recover from the global crisis, and the need for reducing hospital expenditure is still current: this profoundly affects the innovation processes in the health sector. Economic benefits are an essential feature of all new products and services. The innovation in self-care and e-Health has positive economic implications, but it alone is not enough to ensure economic sustainability. Health systems are endeavoring to optimize processes, resources, and supplies, also driven by the increasing attention to their environmental. The health care sector is, indeed, responsible for significant environmental impacts, which often represent big economic problems too: waste production and medical infectious waste, use of chemicals and disposable materials, pharmaceuticals in the environment, radioactive pollution, etc.

Therefore, the interest in what is called "Sustainable Healthcare" has grown sharply in recent

years: although in a fragmented manner, European countries are promoting new strategies in the field of Sustainable Healthcare, encouraged by international organizations which bring together hospitals, patient associations, companies and other health stakeholders. There is no common definition of Sustainable Healthcare, but all the approaches to this topic focus on making health care environmentally, economically and socially viable. To date, policy and education research are the domains that have most addressed Sustainable Healthcare, investigating the implementation of policies and actions to foster sustainability, as well as the promotion of education programs to encourage sustainable behaviors in healthcare practice. Although design could successfully address some crucial environmental issues of health care (from waste reduction to resource optimization), design research made almost no contribution to this field. The present work aims at investigating the role of design towards Sustainable Healthcare, to propose, through case study experience, a systemic vision of the topic. Specifically, we addressed the environmental issues of chronic hemodialysis, a life-saving treatment for people with chronic kidney disease. Hemodialysis has a high impact on the environment: each session uses large amounts of water and energy and produces an enormous quantity of ordinary and infectious waste. All these problems must be addressed from a system perspective since they involve products, equipment, and users, as well as the hospital system itself.

When dealing with medical treatments, we must face big challenges because of the technical and operational complexity, that is further complicated by strict and multi-level regulations. Moreover, several users interact with the system, and design has to meet all their direct and indirect needs, to provide them a safe and positive care experience. So, how can design address environmental sustainability in such a complex system, while maintaining the focus on patient empowerment and user-centered care? Traditional design approaches cannot tackle the complexity of healthcare alone, dealing with all aspects of economic, social, and environmental sustainability. A holistic approach is needed to envision eco-innovative treatment systems. Systemic Design integrates systems thinking and human-centered design methodologies to support designers working on complex design projects in multi-stakeholder and multi-environment systems. Systemic Design defines the material and cognitive flows characterizing the primary system, and thus it allows to establish new connections between the users and the contexts they are immersed in.

The first step, in our case study, was the definition of all the items which make up the system, and the users that directly or indirectly interact with them (Figure 1). We found four items that represent four levels of the system: products (packaging, disposables, devices), equipment (dialysis machine), treatment (hemodialysis as a whole) and local environment (policy and management strategies). The second step is to establish the correct methods to use: we combined different approaches borrowed from sustainable design and human-centered design to analyze each item (Figure 2). A qualitative-quantitative methodology has been used for analyzing packaging and product. It is a proven and field-tested method developed by the Politecnico di Torino, within the Observatory of Eco-Pack. The equipment has been assessed through a disassembly analysis based on Design for Disassembly, that aims at evaluating usability, accessibility and component layout in relation to the final shape. If products and equipment are designed for the world market, the treatment and the organizational strategies are very variable depending on the country, the region and the hospital. In order to establish a

general framework, we compared three different dialysis units and hospitals, in three different countries (Italy, Sweden, Denmark). A specific routine analysis has been set out to assess task types, staff interaction, and patient empowerment. Finally, the local environments have been analyzed by defining the tasks and goals of each stakeholder (region, hospital, unit, home) and the relative decision-making power on environmental strategies. This comprehensive analysis allowed us to set specific guidelines for each item, taking into account technical, operational, social and environmental requirements. The organizational analysis provided us a comprehensive overview of which policies and strategies are being implemented towards sustainability and how they are affecting the other items. Overall, a systemic approach to hemodialysis allowed us to set out specific guidelines for all the items included in the system, considering the needs of direct and indirect users. The comparison of three international case studies highlighted how design must work on product and equipment to improve environmental sustainability on a global scale while addressing local systems and their specific needs to improve sustainability on a local level. MAIN REFERENCES: Barbero, S., Pereno, A., & Tamborrini, P. (2011). Qualitative/quantitative cross analysis to design eco-pack. Paper presented at International Symposium on Sustainable Design. Recife, UFPE, 105-115.

Dorst, K. (2011). The core of 'design thinking' and its application. Design Studies, 32(6), 521-532.

Evans, S., Hills, S., & Orme, J. (2012). Doing more for less? Developing sustainable systems of social care in the context of climate change and public spending cuts. British Journal of Social Work, 42(4), 744-764.

Jones, P.H. (2013). Design for Care: Innovating Healthcare Experience. Brooklyn, NY: Rosenfeld Media.

Piccoli, G.B., Nazha, M., Ferraresi, M., Vigotti, F.N., Pereno, A., & Barbero, S. (2015). Eco-dialysis: the financial and ecological costs of dialysis waste products: is a 'cradle-to-cradle' model feasible for planet-friendly haemodialysis waste management? Nephrology Dialysis Transplantation, 30(6), 1018-1027.

Supporting co-design in complex healthcare systems through the affordances and metaphors of tangible tools.
Karianne Rygh

Healthcare systems

Service design

Co-design

Tangible tools

Affordances

Metaphors

Collaboration

Communication

Multi-disciplinary

The healthcare challenges of our society are placing increasing pressure on limited resources available due to an aging population and a substantial growth in patients with chronic diseases (Engström 2014). Due to these challenges, the Norwegian healthcare system is often referred to as being in crisis. However, these challenges alone do not cause healthcare crises, rather crises develop when there is an incapacity to rethink how we meet these challenges, how care is designed for and how care could be provided differently (Helse- og omsorgsdepartementet 2013; Oslo: Helse- og omsorgsdepartementet. 2014). To avoid devastating financial and societal consequences in the long run (Jones 2013) and to respond to the wicked problem (Rittel and Webber 1973) of healthcare provision, there is a need for immediate and innovative solutions.

Service design and co-design are therefore increasingly being called upon to offer approaches and methods to facilitate collaboration and to harness available resources (Baxter, Mugglestone, and Maher 2014). Services are described as complex, hybrid artefacts made up of things, places and systems of communication and interaction, but also of human beings and their organizations (Meroni and Sangiorgi 2011). Healthcare systems alone consist of multiple stakeholders (i.e. consumers, patients, clinical staff, administrators, insurers), that need to interact with multiple services (i.e. primary care to academic institutional networks) in multiple sectors (from clinical practice to insurance and government) (Polaine, Løvlie, and Reason 2013). The communication between these diverse stakeholders needs to be supported in order to be able to re-think and innovate healthcare provision.

High expectations are put on multi-stakeholder collaborations to produce innovative outcomes despite extensive challenges in the relationships between stakeholders, such as the lack of an internal team culture, team communication (Sarin and O'Connor 2009) and a common understanding and a shared vision of the object of development (Molin-Juustila 2006). The motivations, needs and relations of and between, stakeholders need to be understood and regularly taken into account, as relationships also need to evolve and shift through time, (Polaine, Løvlie, and Reason 2013; Wetter-Edman et al. 2014; Sangiorgi 2012; Clatworthy 2013; Jones 2013).

Effective use of communication tools during design processes has been regarded as an effective means to bridge the evidence based culture of the medical world with the working cultures, perspectives and languages of the other fields. Three-dimensional communication tools are here referred to as tangible tools and are defined as "material components used in participatory design activities" (E. B.-N. Sanders, Brandt, and Binder 2010). The use of tangible tools in co-creation workshops with diverse stakeholders has shown to support co-design by facilitating knowledge exchanges and understanding between participants from various fields. However, there is a lack of discourse in terms of what actually makes such tools successful, in other words, what designed attributes of tangible tools lead to successful outcomes.

Tangible tools (i.e. design games, artefacts, boundary objects, cultural probes) can facilitate the development of a common language, a shared understanding and a shared vision between diverse stakeholders. In addition, they are a means for service designers to intervene in complex contexts using design thinking (Buchanan 2014; Kimbell 2011; Kimbell 2012) and systemic design approaches (Sevaldson 2011; Sevaldson 2010). One aspect of tangible tools that seems to be important is the use of affordances and metaphors in tangible tools. These interrelated terms can offer great potential for enabling co-design processes through offering a means to represent and visualize abstract ideas or modes of thinking, as well as documenting and describing outcomes of co-design processes. According to Gibson (1979), affordances are the action possibilities of objects with reference to the physical condition of the user, while in Norman's interpretation (2013), it is the perceived information with reference to the mental and perceptual capabilities of the user. Affordances are closely linked to metaphors which are beneficial in making abstract concepts tangible for the user, allowing them to more easily express and discuss topics through representations and associations.

As service design and design thinking have both been described as being highly empathic and user-centred, the two fields have also both been critiqued for excluding the more provocative and challenging aspects of design, such as aesthetic competence and critical perspectives (Akama 2009). In literature, tangible tools are often described as being successful because they were ´visually appealing´, ´they caught the attention of participants´, or ´triggered a playful atmosphere´ (Gaver, Dunne, and Pacenti 1999; Brandt 2011; Mattelmäki 2008; L. Sanders and Stappers 2013; Clatworthy, Oorschot, and Lindquister 2014; Buchenau and Suri 2000; L. Sanders and Stappers 2014). Such accounts support that the aesthetics and visual aspects of the tools were indeed successful, but say little about the design process and design choices that determined the final physical outcomes. This gives few insights to support designers in developing tangible tools, meaning the actual design of tools is often developed on a trial and error basis. Unsuccessful workshop interventions challenges the trust that service designers

have built with participating stakeholders. There is therefore a need for a framework and design specifications to support designers in their process of designing successful tools for co-design in complex systems.

This contribution to the RSD6 symposium presents several examples of tangible tools that illustrate the use of affordances and metaphors, highlighting where design specifications for tangible tools are needed and where they could be beneficial. The examples are designed by the author as part of an ongoing research by design PhD focusing on how collaboration can be fostered in the development of healthcare services through affordances and metaphors in tangible tools for co-creation. Through describing the examples, this contribution proposes approaches to creating a scaffolding for designers to assist with the designing of tangible tools. This is expected to consist of design patterns of successful tangible tools, that could lead to the development of a pattern language of tools within service design. Furthermore, the contribution will elaborate on the aesthetic impact that tangible tools have on participants in co-creation workshops and explore what role designers´ aesthetic competence can play in the complex systems that affect citizens´ healthcare and wellness.

The A.R.T. of the Waiting Game: Navigating Assisted Reproduction in Ontario, Canada.
Denise Philpott, Laura Halleran, Sonia Tagari and Windemere Jarvis

Friday 12:00. Room A2.

Fertility

Reproduction

Technology

Feminism

Women

IVF

Ontario

Policy

Systems

Socio-technical

Socio-cultural

Gigamap

Patient experience

Funding

In Ontario, Canada, one in six couples are impacted by infertility at some point in their lives. Additionally, Statistics Canada reports the average age of first-time mothers in Canada has increased to 30 years old, to-date the oldest recorded. In this harsh reality lies the fact that women are having children outside their ideal reproductive window. Coupled with the prevalence of reproductive disability and disease, this reality has created a need for assisted reproductive technologies. Ontario's Fertility Program was established to regulate these technologies and provide them as a service for Canadian women. Unfortunately, a current gap in the program is the lack of a unified resource that empowers women with the information necessary to address their reproductive health and navigate this system. Online ethnographic investigation of infertility support forums and a thorough literature review of peer reviewed and white papers formed the research basis of the argument for a unified tool.

This gigamap and report theorizes a response to this unmet need by serving as a tool to assist women in their navigation of a complex socio-technical system, while also showcasing ways in which policy is hindering optimal access. Through a combination of systemigrams, causal loops, and patient journey maps, this gigamap provides a holistic understanding of what is required to complete a publically funded round of IVF in Ontario. Furthermore, it also highlighting gaps in policy and points for potential legislative intervention. Taking a woman-centered view of population health by centralizing the reproductive journey and using accessible, personalized language, this gigamap considers how cultural expectations for women and fiscal and personal resources influence the use of assisted reproductive technology. This is an ongoing project that continually incorporates user feedback to best address the needs of the women it serves.

Theory of Systemic Design

The Paradigm Strategy
Dino Karabeg and Fredrik Refsli

Wednesday 11:00. Room A3.

systemic innovation

social systemic change

polyscopy

knowledge federation

In our last year's RSD5 symposium contribution we introduced polyscopy as a prototype of "a different approach to information" that can radically augment our "power to transcend paradigms" – and hence our "ability to intervene into systems" in general, and into the global system in particular. We now apply polyscopy to support the core intention of RSD6 and help resolve its main challenge, namely to treat the environment, the economy and the democracy as a single indivisible whole.

What should information be like, how exactly should we create it and use it, so that it may best help us overcome the difficulties that our present way of evolving as society has led us to, and begin to evolve in a radically better way? Polyscopy points to the pivotal role of a community-wide gestalt (high-level view of a situation or issue, which points to a way in which it may need to be handled). The motivation is to allow for the kind of difference that is suggested by the comparison of everyone carrying buckets of water from their own basements, with everyone teaming up and building a dam to regulate the flow of the river that is causing the flooding. We offer to the SDR community what we are calling The Paradigm Strategy as a way to make a similar difference in impact, with respect to the common efforts focusing on specific problems or issues. The Paradigm Strategy is to focus our efforts on instigating a sweeping and fundamental cultural and social paradigm change – instead of trying to solve problems, or discuss, understand and resolve issues.

In what way can we facilitate the emergence of a new cultural and social paradigm? We submit an answer by extending our portfolio of "trimtabs for systemic change" that we presented several years ago at the Bay Area Future Salon. Examples include the design epistemology – an intervention into the very foundation based on which truth and meaning are created in our society; and knowledge federation as a way to use the new information technology to empower social-systemic re-evolution.

We work under design epistemology when we no longer consider ourselves as "objective observers of reality", but as active participants. Knowledge work becomes a system within a system – or within a hierarchy of systems; and we adapt this system, and how we act within it, as it may best serve the wholeness of those larger systems.

We propose, accordingly, to jointly intervene into the SDR system. Instead of giving a conventional presentation of this work, we propose to co-create with you, the organizers, a plenary event, and to:

– Share The Paradigm Strategy as a videotaped message with pointers to details (multimedia introduction) beforehand
– Summarise our proposal in a ten-minute presentation at the beginning of the event
– Have a public dialog (whose interaction we will design together) where the SDR community will digest and assimilate this proposal, and perhaps already begin to seek ways to implement it in practice

Already this very small act, where we recreate our own i.e. the SDR's system to increase its impact and achieve its projected goal, will be a step into the new paradigm; and arguably the key step toward shifting the paradigm. And we have proposals in store that can take this initiative significantly further, even within the short span of an hour.

A note about our title: "Putting the two buzzwords together is so awkward that it's almost cool." We undertake to extend the conventional academic language and action toward forms of expression that lead to impact. The two authors of this proposal represent the two main sides of polyscopic information (Karabeg as a scientist and Refsli as an academic researcher in communication design and a communication designer), depicted ideographically as the circle on top of a square that together compose the polyscopic information "i". The rigorous and analytical utterances of the academia must be coupled with state-of-the-art communication design, if they are to have impact. We submit our title to our shared consideration as a new buzzword – or a new "battle cry" – which the SDR6 may offer as a new guiding light to other communities where serious efforts to improve our civilisation's future prospects are being made.

Design as production of presence – systemic approach to re-designing novelty.
Piotr Michura and Stan Ruecker

Wednesday 11:30. Room A3.

innovation through design

human-centered design

production of presence

"The reality and recurrence of symbiosis in evolution suggests that we are still in an invasive, 'parasitic' stage and we must slow down, share, and reunite ourselves with other beings if we are to achieve evolutionary longevity." (Margulis and Sagan, cited in Clarke and Hansen, 2009, 7)

In this paper, we propose that radical innovation not only changes meanings (and can be driven by meaning change), but also, more fundamentally, changes people's experience of presence (and vice versa), which is the larger framework in which ascribing meanings takes place. Taking this position as the basis for a systemic approach to design has the potential to radically change our understanding of what it means to do "human-centred" design.

According to Norman and Verganti (2014) radical innovation (as opposed to incremental innovation) can come from change in technology or change in meaning. The change in meaning which can lead to radical innovation can be supported by research through design, but only when the researcher-designer avoids the traps of following the currently supported meanings. If designing is making sense of things, designing radical novelty must involve changing a framework in which sense-making takes place.

Humans "make sense of things" (Krippendorf, 1989) to the extent that the created, new structures fit. Humans construct their worlds by "re-cognising stabilities" within a recursive process of acting and sensing the results of acting (Krippendorf, 2007). The stabilities that make human worlds, are just enough, no more no less, to build a coherent, non-contradictory view of the assumed reality.

To design, according to second order cybernetics, is to act and to participate within systems, constantly produced by their constituents, in order to create opportunities for desirable, preferred actions (Krippendorf, 2007.) A designer is always involved as a component of the system s/he wants to influence.

We agree that radical innovation involves changes on the implicit level of the design system. By reshaping the very boundaries of the system, radical innovation enables people to realize potentialities. But we propose that defining designing as "making sense of things," which fits perfectly into the construction of Norman and Verganti, is not the whole picture of what design is. Consequently the possible innovation made through design can also take place on other levels.

But what if designing could be approached as a nonrepresentational phenomenon, something which is not to be interpreted (endowed with meaning) in the first place, but instead allows another form of relationship with the artificial?

Following the ideas of Gumbrecht (1999), we propose that designing contributes to "production of presence," which is a gesture that Gumbrecht contrasts with meaning-making. Drawing on

the history of literary scholarship, Gumbrecht argues that hermeneutics and interpretation gained so much attention within humanities that researchers have tended to overlook other aspects of cultural phenomena. He points to examples of how jazz improvisation, conversation or football matches unfold. These are events that are able to catch us in the appreciation of a moment. Although they might be analysed according to categories of meaning or symbolic value – those analyses miss the actual point of what those events are about. According to Gumbrecht they are first of all nonrepresentational and non-meaning-producing acts.

He proposes that human engagement with the artificial is not narrowed to attribution of meaning and that in addition to meaning-making, there is our "experience of presence" – an intense feeling of "here and now." Presence in his view is "the convergence of an event-effect with an embodied form." It is about emergence of forms, following the Luhmanian reading of Spencer-Brown's calculus of form, where distinction and indication select what is to be observable. The form is a unity of distinction – marked and unmarked states, demarcating boundaries of a system against its environment.

Gumbrecht speaks about "embodied form" associating the presence effect with spatial and tangible material aspects that effect our bodies and senses. Landgraf (2009) in the analysis of Gumbrecht opposes this view, placing the source of those effects in pre-representational acts of making a distinction. He points to drawbacks of connecting the notion of presence solely to embodiment in a danger of pushing a more or less tacit process into something concrete and real (and making materiality a precondition of experience and observation).

"With the help of such conceptual substitutions [system/environment distinction, Spencer-Brown's form concept], we can comprehend the psychic and the nervous systems as observing and relating to their environment long before comprehension mediated through language and abstraction is initiated." (Landgraf 2009, 196.)

Similarly Katherine Hayles (2017) points to non-conscious cognition as possibly shared among organisms as well as extended into the realm of networked machines. She states that organisms and machines are involved in "processes that interpret information in contexts that connect it to meaning", where meaning is understood, on the very basic level, as a selection of information. She provides a non-anthropocentric view that we live in hybrid human-technical assemblages.

Analogically to Luhmann's idea of "a person" understood, quite surprisingly, as a complex of expectations put forward by the social system, we want to argue that designing of novelty might be based in a thorough reconceptualisation of commonly assumed system boundaries involving resignation from the central position of a human and even in questioning the very notion of it.

References

Clarke, Bruce and Mark B. N. Hansen (2009). Introduction. Clarke, Bruce and Mark B. N. Hansen Emergence and Embodiment. Durham & London: Duke University Press.

Hayles, Katherine, a lecture Contesting for the Meaning of Meaning: Cognitive Technologies, Cognitive Humans, Cognitive Others, at the University of Rhode Island, April 17, 2017.

Gumbrecht, Hans Ulrich (1999) Epiphany of Form: On the Beauty of Team Sports. New Literary History, 30: 351-372.

Krippendorf, Klaus (1989). On the Essential Contexts of Artifacts or on the Proposition that 'Design Is Making Sense (of Things),' Design Issues, V(2), 9-39.

Krippendorf, Klaus (2007).The Cybernetics of Design and the Design of Cybernetics. Kybernetes 36(9-10), 1381-1392.

Landgraf, Edgar (2009). Improvisation: Form and Event. Clarke, Bruce and Mark B. N. Hansen Emergence and Embodiment. Durham & London: Duke University Press.

Norman, Donald A. and Roberto Verganti (2014). Incremental and Radical Innovation: Design Research Versus Technology and Meaning Change. Design Issues, 30(1), 78-96.

Cognitive Point-of-View in Recursive Design
Evan Barba

Wednesday 12:00. Room A3.

multiscale design

recursive design scale

systemic design

sustainability

Systems thinking employs the concept of scale to denote the level at which a system is observed, and commonly organizes these levels into multiscale hierarchies of systems and subsystems (Pattee 1973; Wilensky and Resnick 1999; Salthe 2002, for examples). However, less formal uses of scale seem to be central to the way human beings organize the external world and represent it, both consciously and unconsciously, in the mind (Santayana 1998; Sale 2007; Hegarty et al. 2006). Many implicit and explicit uses of scale can be found in scientific and academic discourse as well as everyday language. Each of these uses has distinct nuances, but they all share in a broad definition of scale as a nested hierarchy of levels, and this suggests a common underlying conception or process that helps to organize human thinking.

Despite being fundamental to how we conceive of the world, there is little systematic study of the way designers employ scale in their practice, and few general principles or models of design that explicitly use scale as an organizing concept. Nevertheless, its foundation in systems thinking and its vital role in human cognition suggest that scale-thinking is likely to be an important feature of the design process. In this presentation I will further explore the role of scale in design by reanalyzing a well-known case study, the design of Herman Miller's Mirra Chair, to demonstrate the multiscale, or recursive, nature of the design process. In particular, I will focus on the notion of cognitive point-of-view as a way to understand how designers continually reframe problems and resituate themselves at different scales. Background In 2001, the internationally acclaimed Herman Miller furniture company, famous for its classic Eames Lounge Chair and high-end Aeron office chair, began designing a new mid-level office chair—the Mirra Chair. The company partnered with McDonough Braungart Design Chemistry, headed by architect William McDonough, to implement their trademarked environmentally sustainable Cradle-to-Cradle (C2C) design strategy for the Mirra Chair (McDonough and Braungart 2002c; McDonough and Braungart 2002a). The Mirra Chair was the first product designed using a C2C protocol, and accounts of the process have appeared as published case studies (Lee and Bony 2009; McDonough and Braungart 2002b). Among other things, those case studies detail the ways that the constraints imposed by the C2C protocol forced the Herman Miller design team to reimagine its design and manufacturing processes. Some of the more notable observations include the attention paid to the fabrication and chemical composition of materials used in the various components of the Mirra Chair (armrest, base, back support, etc.) and the need to address the design of the production line and packaging (both of which where previously outside the boundaries of the design process) to meet C2C requirements.

When reanalyzed through a systems lens, the Mirra Chair case study provides a detailed account of how the C2C protocol required the design team to design at multiple scales. The accounts portray a design team that continuously shifted its focus from designing the form of the Mirra Chair itself to designing the various subsystems that produce its material components. This was a departure from the process the team had used for previous products, which treated the acquisition and fabrication of materials solely as constraints rather than as opportunities for the design of more effective subsystems. By continually shifting their perspective, the team was able to accomplish their environmental and product goals while also facilitating the C2C design of future products. Recursive Design

A similar notion of taking multiple perspectives on a given system was described abstractly by Joseph Goguen and Francisco Varela (Goguen and Varela 1979). They used the term cognitive point-of-view (CPOV) to describe the way observers focus their attention when analyzing a system, and offered seven possible configurations of observer, system, subsystem(s), and environment (Figure 1). Their intention was to draw a distinction between two complementary approaches, behavioral and recursive. In the behavioral approach, the observer works only with the observable behaviors and collective variables of a subsystem. In the recursive approach, the observer analyzes the subsystems at the component level, reconfiguring them to create more desirable outputs. The complementary relationship between behavioral and recursive approaches is a model of how CPOV changes when working at multiple scales. Goguen and Varela's work readily describes the Mirra Chair design process. The Mirra Chair accounts detail a change from the "old way" of designing a product to a new process using the C2C protocol. This change can also be described in Goguen and Varela's terms as a move away from the behavioral approach to a recursive one. In the old method, designers dealt only with the outputs of a subsystem. For example, they would discuss the properties of PVC in terms of collective behaviors like strength, durability, malleability, melting point, etc., but did not attempt to re-design PVC itself when these

properties were insufficient. Yet, the C2C protocol required them to do just this. It forced the design team to look recursively into all the subsystems they relied on, treating them as unique design problems in their own right that needed to be addressed in order to proceed with the higher-scale design of the Mirra Chair.

The recursive model maps nicely onto the discussion of the Mirra Chair in many respects. Yet, some work needs to be done to update it if we wish reveal a more general theory of the role of CPOV in design. Using the Mirra Chair case study as a point of reference, my presentation will provide a more thorough discussion of the ways in which the concepts of cognitive point-of-view and recursive design can help explain the Mirra Chair design process. In the course of that discussion, I will identify the limits of the original model, and show how it can be extended to yield a more dynamic notion of cognitive point-of-view and a general theory of recursive or multiscale design. Finally, I will discuss the implications of this theory in regard to a variety of topics relevant to both design and systems. These include ways we might train design students to more consciously and reflectively employ recursive design when addressing problems in interdisciplinary contexts, how organizations and teams might employ a recursive approach to projects and project management, and how we might proceed with a more formal research agenda in recursive design.

Economy and Systemic design

The Design of Design
Uttishta Varanasi, Deergha Joshi, Akshay Yadav, Kamana Marwah, Aparajita Tiwari and Praveen Nahar.

Design

Design thinking

Designer

Development

Economy

Evolution

What is the role of a designer? Is it the manipulation of the radii on the latest phone, which is to be replaced next year? Is making user friendly screens for "the next big thing"? Or is it dreaming up "the next big thing"? Is the role of the integrator of design, business and technology? Is the designer supposed to be a driver of flourishing democracies, communities and diverse environments?
The right answer is all of the above; and a lot more.
The definition of design has been evolving from "aesthetic decoration" to "how a product looks, feels and works"; but a single sentence struggles to explain the scope and extent of what design can do. Design can be broadly defined as the act of creation, but even that falls short.
Since the industrial revolution our economies have been in a constant state of evolution; from mass manufactured products to a service based economy to the next major change. Economies have also been becoming more and more globalised. Alongside, the role of a designer has also evolved; from aesthetics to product differentiation. Still, there is a disconnect between the design fraternity and everyone else; something even designers fail to bridge. This is very evident in India, where design is mostly just seen as a beautification process.
India is also undergoing huge changes; from "Make in India", to the developing startup culture across the nation. The massive rise and empowerment of the middle class has been an integral factor in facilitating these changes. The context with which India has to be designed, and designed for has evolved. Following a similar growth pattern to other developed countries in the west, or imitating China's manufacturing success story cannot be India's route to development. The qualitative aspects of our society must grow along with the quantitative growth of our economy; something that design can easily bring about.
Through our study, we probe into the various aspects of this evolving economy and the parallel changes in the role, perception and challenges for design and designers across the country.
We talk about the Indian context of redesigning design; from business innovation to societal

transformation to design education. How the Indian concept of design needs to move beyond beautiful motifs, and delve into bigger questions; from the problems of education, policy making, rural livelihood, etc.

Bringing these concepts into reality, we have created frameworks and triggers that aided local communities to understand and utilise design to solve issues. We provided platforms for both, designers and non-designers. We created a design student toolkit that aims to empower students to think beyond the hard skills they learn at a design school. We have also conducted workshops to educate students of backgrounds other than design on the possibilities of design; helping remove misconceptions on what design is capable of, and bettering the scope of meaningful collaborations.

We looked at what designers know they are capable of; how can we facilitate a greater design fraternity; how to train more relevant designers, and empowering the masses with design.

Circular Economy for Food – A systemic interpretation of the circular economy through the holistic view of the gastronomic sciences.
Franco Fassio, Nadia Tecco

Wednesday 11.30. Room A4.

Systemic Food Design

Circular Economy

Gastronomic Sciences

Food

Holistic vision

In order to talk about systemic approach applied to the food world it is a necessary to consider two important players involved in this process. The first one, the Slow Food movement, founded in 1989, an international association that works to safeguard biodiversity, to prevent the disappearance of local food cultures and traditions, to counteract the rise of fast life and to combat people's dwindling interest in the food they eat, where it comes from and how our food choices affect the world around us. Since its beginnings, Slow Food has grown into a global movement involving millions of people over 160 countries, working to ensure everyone access to good, clean and fair food. The second one is the University of Gastronomic Sciences (UNISG) founded in 2004 by the first actor, Slow Food, in cooperation with the Italian region of Piedmont and Emilia Romagna. The main aim of UNISG is to create a new figure, the Gastronome, a new type of food professional, who learns about the entire food-production system, from agricultural origins through industrial transformation and distribution, with special attention to environmental and sustainability issues.

Thanks to the strong theoretical contribution developed at the University of Gastronomic Sciences, in

particular within the Systemic Food Design LAB (SFD LAB), and great application opportunities which is in the bosom of Slow Food, the systemic approach is spreading and evolving in all areas that are part of the agri-food system: from production to consumption, from the packaging to the food places until you get to the cultural events for the promotion of values of the food itself. In the context of the gastronomic sciences, a complex system where different kind of actors interact with each other, Systemic Food Design LAB has the objective of developing, at a theoretical and applied level, a systemic approach based on the construction of valuable, collaborative and sustainable relationships applied to food in all its many meanings. Starting from an analysis of the flow of matter, energy and knowledge within each system and between one system and another, we study the structure of the overall behaviour of interacting elements in order to design relationships of value that narrate a system quality.

The systemic approach for Gastronomic Sciences is the glue that develops transdisciplinary systems, it is the builder of cultural bridges, it is a source of new perspectives, because the food system determines impact on the area and the community more than any other system

In the context described above, Systemic Food Design LAB is developing a project named "Circular economy for Food", a catalogue of existing national and international experiences and new perspectives of the Circular Economy declined in the world of food. The main objective is to analyse projects where the underlying principles of the Circular Economy are applied, and through the Systemic Food Design approach to give empirical contributions with developed, developing and transition perspectives.

In addition, the project intends to observe through the systemic approach lens, the circular economy phenomenon, a first step towards a systemic vision, but that still has the defect to not change the hierarchical structure of the system. In fact, the main guideline of circular economy – a gap must be designed so that it can become an asset to another system – generated in the current industrial society, closed systems themselves (companies recover their waste expanding their offering , talk about efficiency, but in the meantime do not dialogue with others and thus a monopoly continues) or open systems (situations where multiple realities interact with each other, develop business relationships), but in both cases, the economic model is not questioned but simply tweaked the undeniable order of resources. This paper is going to present specific examples where the Circular Economy principles are applied in the food system (to and from the actors of the food system) and in the second part of the article we are going to analyze every single case in order to lay the groundwork for an evolution from the circular pattern to the systemic model in the complex world of gastronomic sciences

---

Designing the Ecocene: Mapping the Political Economy of Design.
Joanna Boehnert

Wednesday 12:00. Room A4.

knowledge visualisation

ecological literacy

political economy

sustainability

transition

As the dynamics of the Anthropocene break planetary boundaries and create global instability with increasing risks to human civilisation, ecologically informed design strategies are in development. This movement in sustainable design must be accelerated. Design sits in a pivotal sense-making and change-making space to facilitate ecological transition – once informed by ecological literacy and critical perspectives. Yet while design has the potential to transform ways of living in emancipatory and sustainable ways, it is often involved in reproducing the unsustainable and in obfuscating power relations around this process. For this reason, critical thinking and attention to power and the political economy of design is a necessary part of creating conditions for redirected, regenerative design.

The concept of the Ecocene (Boehnert 2018) describes an era of where the generation of new futures is driven by ecologically literate ways of knowing that inform the design of sustainable transitions. The Ecocene concept shifts focus from analysis of the problems to development of solutions. An ecologically viable future depends on a new understanding of human-nature relations and the design of new ways of living that emerge from this perspective. It also depends on designers with the critical capacities to identify unsustainable ideas, system structures, practices and products. Additionally, sustainable design and development require new agencies, process knowledge and practices. With these perspectives and types of knowledge, designers can work towards an Ecocene by propelling the cultural change necessary to survive and potentially flourish in the Anthropocene.

One of the ways that design can do this work is with knowledge visualisation. The practice of knowledge visualisation facilitates interdisciplinary collaborations and learning on complex, multi-dimensional and often controversial problems as a prelude to the design of sustainable alternatives. It bridges disciplinary silos and sectors to address communication and learning challenges as it displays information of different types (temporal, geospatial, topical, statistical, networks) on various scales (micro, meso, macro). By visualising multi-faceted conceptual propositions, complex systems and future scenarios, knowledge visualisations can help designers help clarify system-level threats and opportunities to sustainable transitions.

Despite process innovation and deepening and widening knowledge base, the design industry continues to struggle to contribute to slowing down and reversing the trajectory of accelerating planetary crises conditions. The political economy of design can be understood to include system-level obstacles that inhibit the wide-spread development of sustainable futures (Boehnert 2014). This paper will describe the early stages of a research project using knowledge visualisation practices to map the political economy of design. The research will use knowledge visualisation mapping practices with interdisciplinary groups to identify barriers and opportunities to and for sustainable transitions. It will provide an overview of the political and

economic dynamics that are relevant to designers concerned with sustainability. The Mapping the Political Economy of Design project will make system structures visible while identifying spaces of intervention. New visual resources will help designers and policy makers respond to some of society's most challenging problems with design and policy interventions.

References
Boehnert, J (2014) Design vs. the Design Industry, Design Philosophy Papers. London: Bloomsbury, 12 (2), pp. 119–136.
Boehnert, J. (2018) Design, Ecology, Politics: Towards the Ecocene. London: Bloomsbury.

Flourishing

Reconceiving the Hospital as a Business for Flourishing
Jyotish Sonowal and Peter Jones

Healthcare

Flourishing

Business model

Social system

Soft Service

The healthcare sector in the Western world is in the midst of a significant change. The majority of healthcare expenses are incurred through major tertiary care, performed in hospitals, which are generally structured and function in much the same way as 100 years ago. Care organizations are undertaking a grueling process of having to maintain clinical continuity and yet advance as businesses in a world where funding policies, clinical and information technology, patient demographics and relationships between other healthcare systems are constantly changing (Cohen et al., 2004). Besides, governments throughout the developed world are under pressure from the goals of the (IHI) Triple Aim, to reduce healthcare costs, while improving the quality of care (Howie & Erickson, 2002; McCue, 1997; Segesten, Lundgren & Lindström, 1998) and satisfy the patient experience.

In such an environment, healthcare providers are finding it difficult to innovate business models, or to understand the far-reaching social and environmental impacts of their services. Our OCADU research project investigated the adoption of designing business cases as systems for flourishing, to help clinicians and administrators in a hospital to reconceive and analyze their current clinical services, discover gaps and barriers to flourishing, and define recommendations. We take Ehrenfeld's (2002) concept of flourishing as the aim of sustainability, nothing short of sustaining all life on earth forever. Keyes (1998, 2002) defined social flourishing as the sum of qualities that would ensure a healthy sense of well-being and social integration, which holds significance for healthcare activities. We employ a social ecosystem model to help identify functions and measures of flourishing across nested, multifinal social systems. Using the Flourishing Business Canvas (Upward and Jones, 2016), this research project explores ways of impact definition and evaluation and also measures social and environmental benefits which will help decision makers in a healthcare setting.

The study resolves a base of relevant literature in business models, business sustainability, lean process, and flourishing, in the healthcare context. A design action research methodology was employed, with expert and practitioner interviews and a business model design workshop. The participatory design workshop introduced the Flourishing Business canvas to clinical decision makers (director and managers) in Toronto's North York General Hospital in a generative session. The participants were engaged to collaborate and articulate their service lines as businesses, mapping their proposals using the FB canvas in the form of a model. Observations, verbal data, and canvas results were recorded. This and data from interviews with other clinical directors are tallied and analyzed to look for common challenges faced by the hospital and areas of opportunities. This analysis also leads to rich insights on the Flourishing Business modeling process, especially in a hospital setting.

The unique contribution is the design of a process and method for representing conditions and elements of flourishing within healthcare service lines: a business process that is currently desired but unavailable to organizations (Jones, 2016, personal conversation). The recommended process is an attempt at changing the mindset of planners in a hospital from traditional capital planning to systemic design-based planning and resource decision making. The culmination of the research insights led to service design proposals embodied in a blueprint for a "soft services", based on the 4C journey model (Jones, 2017) and adapted for this research.

Research-action applied to the design of a flourishing community dedicated to sustainable fashion in the Nouvelle Aquitaine region.
Marion Real and Iban Lizarralde

Wednesday 16:00. Room A2.

Design for emergent

Social entrepreneurship and innovation

Systemic design

Fashion communities

Third-places

Intermediary object

Our research is part of a new decentralized vision of the territories and takes part in the construction of new socio-technical models of circular economy, which seek to increase the

environmental efficiency of processes, optimize the use of accessible resources and the autonomy of stakeholders in regional ecosystems.

Our research focus on the study of intermediary objects of design present in collective entrepreneurial actions and seeks to develop new methods of animation promoting the design for emergence. More precisely, we analyze how to create more synergies between the new entrepreneurs of the territory, the existing industrial cluster and the political decision-makers by investigating three problematics:
– What tools will enable actors to share a holistic and evolving vision of territorial metabolism?
– How to prepare and animate organization/business modelling workshops for emergent third-places of open design and distributed production on the territory? (hubs, resource centers, fablabs, living lab…)
– How to actively manage the flows and tensions present in the structure to accelerate the continuous creation of virtuous loops promoting a more circular economy?

Our research is anchored in a research-action approach on the territory of Nouvelle Aquitaine. This resolutely inductive and empirical approach considers the field as a place for experimenting and confronting the concepts and tools imagined from the observations and situations experienced within this terrain. From an operational point of view, the research action is based on a collective action aimed to endeavor the development of activities around the valorization of used textiles and old clothing. It involves innovation clusters, the regional circular economy platform, sorting, upcycling and recycling centers, designers, seamstresses, brands and citizens of the territory.

Systemic Maturity Models and Multi-organization collaborations: the ACMHI Mentally Healthy Campus Maturity Model.
Sharon Matthias and Jess McMullin

Wednesday 16:30. Room A2.

policy and policy implementation innovation

flourishing communities

health and population wellness

No single profession, group or organization can successfully address today's societal No single profession, group or organization can successfully address today's societal challenges alone. This is increasingly declared, but operationalizing it is a different matter. Conventional management and

governance tools are based on implicit design criteria that support individual organizations' isolated operation. Collaboration that simply combines multiple organizations' individual actions does not provide the synergy required to achievethe level of collective impact required to match citizens' increasing expectations and increasing diversity and complexity of users' needs. Few leaders have robust tools to help them operationalize the need for multiple persons, professionals, organizations and sectors to collaborate effectively and reliably as a matter of routine in all dimensions of operation.

For legacy systems such as healthcare, education, justice and environment, the cost of not attending to this is high. Organizations and professions, as well as the governments that fund them, are focusing on monetary costs while silently leaking citizens' confidence and trust in their ability to solve problems and achieve required results in citizens' lives.

One example of a complex societal challenge is supporting people to improve their mental health and provide appropriate services for mental illness and addictions. This requires a complex strategy that integrates the efforts of an individual with many other people, professions, agencies and governments. These must provide a myriad of services and supports, which also recognize the many interacting factors of the individual's physical, social and informational environments. This challenge also includes moving from illnessorientedstrategies to integrated, wellness oriented strategies that combine the worldview and narrative of increasing health, achieving peoples' potential and quality of life, as well as those of treating, supporting or preventing illness.

However, operationalizing a holistic view that combines such a host of factors and their differing fields of knowledge, as well as requiring multiple organizations to work together as a matter of routine can be paralyzing: Which factors? How do we know how we're doing,who should do it, and what should we do next? And how do we know how our own contribution best helps create synergy so we get as much value as possible?

What is a Maturity Model?

A maturity model describes the stages of maturity through which a process evolves, to provide increasing levels of reliability and value. It supports self-review and collaborative conversations – for designing strategies, adapting management and governance systems, and assessing progress.

Unlike traditional evaluation, a maturity model focuses on the organization's capability to create change, rather than the change itself. A maturity model doesn't replace evaluation, but can be an important part of a leader's suite of tools for assessing progress and choosing priorities.

Systemic maturity model for human systems

Some maturity models follow only one dimension or process3, but a human systemsmaturity model will have significant additions:

• First, a systemic maturity model combines multiple related dimensions or processes and the maturity level of each, providing a way to assess each in relation to the whole. This allows a strategic approach to evolve from a population perspective to a whole systems perspective.

• Second, systemic maturity models honour the reality that, to assure its ongoing resilience, a system must continuously adapt in response to changing demands of its environment. To achieve balanced growth and resilience, each dimension or process within a human system must learn from experience and imbed that learning in successive stages, but in a way that supports rather than impairs or neutralizes other dimensions.

• Third, a systemic maturity model acknowledges that participants are not all at the top level in every dimension. Rather than the mirage of perfection with both commitments and goalposts in the distant and unaccountable future, a maturity model shows where specific immediate improvements can be made—the next step or the adjacent possible.

• Fourth, a systemic maturity model can provide the needed, constant reminder of the operational requirements for making a shift in worldview and archetypal narrative – for example an evolution from illness-oriented systems to integrated illness and wellness-oriented systems.

• Finally, human systems are not islands. The seamless interaction between systems is increasingly a core aspect of a client, patient or student's experience and successful outcome, and critical to achieving a seamless client/patient journey. So, a systemic maturity model must include competence at inter-system as well as interorganizationand interpersonal collaboration, and must include ways for systems to create common understanding of their shared experience among all members of all systems.

Presented as a dashboard or scorecard, a systemic maturity model can provide a powerful communication tool for multiple audiences, and thus a potentially valuable change management and governance tool. Multiple organizations using the same 3 The capability based maturity model is a recognized type of maturity model, though its stages may not include one for adapting and moving to the next developmental stage. 3maturity model can identify their individual contribution in the context of the combined ability to create their common outcome.

An example of a systemic maturity model for a human system

The authors present their experience with ACMHI – the Alberta Campus Mental Health Innovation initiative to improve post-secondary student mental health. An innovation project funded by the Alberta government from 2013 – 2017, ACMHI enabled a student leader organization to stimulate action of student associations on 14 small to medium size post- secondary institutions. The authors were contracted to develop Legacy Tools,including a systemic, Mentally Healthy Campus Maturity Model, that would enable future student leaders to build on the work and learnings of student associations during this initiative. These Legacy Tools also helped student leaders make their case for incorporating student-led initiatives in a province-wide Post-Secondary Student Mental Health strategy.

Student leaders directed that the Legacy Tools embody two key design principles – a wellness orientation and a mentally healthy campus frame. This paper describes the form and elements of the systemic maturity model, operationalizing it for three levels of user capability as well as potential applications to other societal challenges needing systemic design approaches. Keywords

Systemic Design Methods and Methodology

Prototyping as a resource to investigate future states of the system.
Juan de La Rosa and Karolina Kohler

Design model

Prototypes

Prototyping

Design research

Future design

Not-yet-existing

Displacement

Design disciplines naturally search to solve ill-defined or wicked problems (Rittel & Webber, 1973). Current design process and practices show that design objects are usually part of a network of different actors (Latour, 1990) that interact between each other. Therefore, even when analyzing simple cases, designers will seek to increase uncertainty to reveal the complexity of the system that contains the case of study. This process of scope and observation of macro and micro scale details can be identified as a problem of scale and resolution of complex systems (Arenas, et al, 2008), and can help us defined the nature of design problems as systemic by nature.

Even though the lenses provided by the General Systems Theory (Bertalanffy & Rapoport, 1956), have been profoundly helpful for designers to recognize and map complexity of the current systems where the problems are situated, the futuristic nature of design that seeks for the definition of the not-yet-existing requires the production of new models that can help us map and investigate future states of the systems once the designed artefacts have been incorporated to them.

This paper discusses the opportunity to use prototypes as argumentative and conversational objects (Galey & Ruecker, 2010) that are designed, not to validate a pre-established idea, but as probing instruments that uses the distance between them and the users (Simondon, 1958; Latour, 1990; Akrich, 1992) and the new affordances defined by the users to reveal possible complex future interactions that may be established and the possible transformations of the socio-technical system.

With the analysis of two case studies that recognized the ability of objects to create a better understanding of the possible futures that are created by their interaction and produce a map of the structure of those possible futures (Voros, 2003). Later, we use the Analysis & Synthesis reframe model

(Alexander, 1964) and the Divergence & Convergence model (Banathy, 1996) to produce a new initial procedural model that presents an iterative deployment of displaced prototypes on the periphery of the object of study, that could be used to produce a map of the structure of the plausible and preferable states of the system. References (abstract) Akrich, M. (1992) The de-scription of technical objects. In BIJKER, W. E., & LAW, J. (eds.) Shaping technology/building society: Studies in sociotechnical change. MIT press.

Alexander, C. (1964) Notes on the Synthesis of Form. Harvard University Press.

Arenas, A., Fernandez, A., & Gomez, S. (2008). Analysis of the structure of complex networks at different resolution levels. New Journal of Physics, 10(5), 053039.

Banathy, B. A. (1996). Information-based design of social systems. Behavioral Science, 41(2).

Von Bertalanffy, L., & Rapoport, A. (1956). General systems. Yearbook of the society for the Advancement of General System Theory, 1, 1-10.

Galey, A., & Ruecker, S. (2010) How a prototype argues. Literary and Linguistic Computing, 25(4).

Latour, B. (1990) Technology is society made durable. The Sociological Review, 38(S1).

Simondon, G. (1958). Du mode d'existence des objets techniques: thèse complémentaire pour le doctorat ès lettres présentée à la Faculté des Lettres de l'Université de Paris (Doctoral dissertation).

Rittel, H. W., & Webber, M. M. (1973). 2.3 planning problems are wicked. Polity, 4, 155-169.

Voros, J. (2003). A generic foresight process framework. foresight, 5(3), 10-21.

Capacity Building Through Community Building: The Story of the Systemic Design eXchange.
Brent Wellsch, Roya Damabi, Ben Weinlick and Aleeya Velj

Systemic Design

Capacity Building

Community Building

Reflective Practice

Community of Practice

Flourishing Community

This paper profiles the learning journey and emergence of the Systemic Design eXchange (SDX): a community of practice based in Edmonton, Alberta, Canada seeking to build cross-sectoral capacity (e.g. private sector, public sector, not-for-profit sector, etc.) in the discipline of systemic design. SDX launched in December 2015 and has been stewarded through a

collaborative partnership between two innovation labs from different walks of life: the Government of Alberta CoLab and the Skills Society Action Lab.

SDX currently features a membership base of more than 350 leaders from diverse sectors who gather on a bi-monthly basis. SDX has a bias towards learning by doing and aims to be a gathering place where multiple sectors can come together, learn about, and explore systemic design.

Theory around communities of practice has driven the evolution of SDX. The notion of a community of practice was developed by Jean Lave and Etienne Wenger (Lave and Wenger 1991; Wenger 2000) as the basis of a social theory of learning. What characterizes a community of practice is that it is a social grouping bound by an inherent shared interest in co-developing capacity in a common practice. Beyond this, communities of practice typically engage in efforts dedicated towards developing shared meaning over time (i.e., mutual sense-making), both about the practice they are exploring, as well as the broader environment and context that the practice seeks to interface with.

SDX demonstrates the power of using a community of practice approach to collectively explore systemic design and catalyze the adoption of systemic design as a methodology, toolkit, and mindset for tackling complex challenges.

SDX does this by bringing together a diverse group of people, enabling participants to create a shared theory of change around how systemic design can further both incremental and transformative social innovation, and by enabling participants to explore the connection between systemic design and other emerging (and more traditional) change practices. At an individual level, SDX encourages and supports members (SDXers) to work with reflective practice and aims to bridge personal and collective approaches to change.

To facilitate learning, SDX adopts a multi-pronged approach:
• SDX invites innovators to present their stories of how they have applied systemic design to a complex challenge and offer insights about what they have learned.
• SDX enables new collaborations to form. This has led to spin-off efforts that have applied systemic design to various complex challenges.
• SDX seeks to understand the personal experiences of its community members to appreciate the opportunities and barriers each are facing in applying systemic design in their own contexts. This helps to generate empathy for fellow community members and surface future areas of exploration for the community.

By prioritizing experiential learning, SDX complements and bolsters the academic tradition that underpins the theory of systemic design. At the heart of the systemic design ethos is an acknowledgement that the complex nature of the 'wicked' problems we seek to address requires not only systemic solutions, but an intersectoral approach that is systemic in terms of the membership of the change agent team itself.

While simple in theory, creating the conditions for genuine cross-sectoral learning and collaboration to emerge can be difficult to accomplish. However, the design of SDX offers effective principles for how to achieve this. A community of practice design is enabling SDX to break down siloes and generate a sense of common identity amongst its membership. In short, this is uniting a flourishing community of practitioners in their shared purpose around addressing and creating positive systemic change through the application of systemic design.

To conclude, the authors seek to contribute to the dialogue at the upcoming Relating Systems Thinking and Design Symposium by chronicling harvested insights concerning how a community of practice approach can serve as a promising model for practically disseminating awareness and knowledge of, confidence in using, and united conviction towards the adoption of systemic design for addressing complex challenges.

Storytelling as a driver for policy developments.
Hilde Opoku and Kristin Støren Wigum

Art

Participatory design

Globalization

Awareness for Change

System Oriented Design

Policy-making

The world situation today calls for new holistic approaches towards questions concerning the relation between human equality and maintenance of natural ecosystems that have fundamental consequences for further development of our global civilization (Meadows et al. 1972, 1992)(Hylland-Eriksen, 2014). This paper will discuss how global oriented art and artists can be a catalyst of value changes, through local experiences and storytelling. Does art play a role in the shaping of politics and future systems design?
Storytelling is a common goal and tool of the different professions mentioned. However, what stories do we want to tell, how can we become able hearing them, and where do the stories come from?

Our western life style permeated by consumerism, has become global. Rituals, rhythms of the day, holidays, and activities in our spare time have become costly affairs. Designers have used their skills together with production companies and advertising industry, to give shape to everyday things as trendy products that must be exchanged regularly. Status is not what you have as such, but having the right product at the right time (Dokk-Holm, 2001). The ideal designer working for a non-profit cause is rare. However, lately designers who are working in the intersection of art, architecture and design, have introduced the values of arts and crafts modernised by artistic methods and storytelling. Expression of local identity is shown through choices of local (raw)material and crafting methods. Slowly new – more sustainable solutions – seem to be emerging.

Some important distinctions between a piece of art work and a designed product, are the designers focus on functionality, user perspectives, and criteria for mass production in an economic efficient way for a certain market, whereas the artists use their own experiences, perceptions of society and context in life to emphasize what they find important and valuable to visualise and talk about.

It may seem as design education in Scandinavia and Europe is returning to more original organisational structures that bring design, art and architecture closer together, as intended described by the Bauhaus educational concept (Findeli, 1995). What potential has this constellation in context of wicked problems, related to social, ecological and economic sustainability, and globalisation of production and local place development to day? What values do artists bring into public debates of place development, or political decision making in general, promoting democratic processes?

Participatory design is seen as crucial for successful design especially within service design. Dialogue and feedback from users of the new solutions is guiding the design team towards more appropriate concepts (Hannevig, Parker 2012). Artwork and art performance has its purpose to effect the audience. Often the viewer is meant to participate for a personal experience. New research is exploring more extensively the participation in material-based art work (Berg 2014). Berg points to the need of certain skills in order to reach the potential of public participation of art processes, such as how art may bring in a transformative social force to a place.

This paper will explore the voice and force of artistic work and process as important channel for democratic change and contribution to new forceful stories for policy-making, awareness and inspiration for design for sustainable life-styles and society. The paper compares the works and approaches from an artist who has crossed the disciplines from design to art, emphasizing our manifold of resources, and an artist who tells the stories of products imported to his country Ghana, from Europe and industrialised cultures and how they now are literally woven into his daily surroundings.

In a globalized communication structure we are now able to hear and see voices from all the continents and it is not necessarily pleasant stories that reach our own everyday life from abroad. How may this have an effect on new politics in Norway for sustainability? Through system oriented design methodology (Sevaldson et al, 2014) we look at the impact of

contemporary artists on the conceptualization of product impact on culture, ecology and democracy.

Referances:
Berg, Arild. (2014). Artistic Research in Public Space, Participation in Material-based Art. Aalto University publication series, Doctoral dissertation 33/2014. Finland, Helsinki: Unigrafia. ISBN-978-952-60-5601-2

Dokk-Holm, Erling og Siri Meyer (red). (2001). Varene tar makten (trans. Eng. The commodities overtake the power). Gyldendal Norsk Forlag. Gjøvik: AIT Gjøvik AS.

Findeli, Alain. (1995). "Moholy-Nagy's Design Pedagogy in Chicago (1937-46)" , p.29-43, Margolin, Victor (editor). The Idea of design. Cambridge, Mass., USA: MIT Press.

Hannevig, Lise and Marjorie Parker. (2012). Dialog. En praktisk veilder. (In Norwegian only. transl. Eng.: Dialouge. A guidebook for practice.) Finland, Porvoo: Bookwell OY. ISBN 978-82-92773-50-5

Hylland Eriksen, Thomas. (2014). Globalization: The Key Concepts. (Second edition) Bloomsbury. London /(Norwegian: 2008) Globalisering: Åtte nøkkelbegreper.

Meadows, Donna, Dennis Meadows and Jørgen Randers.(1972).The Limits to growth. USA: Universe Books. ISBN 0-87663-165-0

Meadows, Donna, Dennis Meadows and Jørgen Randers. (1992). Beyond the limits. Confronting Global Collapse. Envisioning a Sustainable Future. USA: Chelsea Green Publishing. ISBN- 0-930031-62-8

Sevaldson B., Ryan A. Eds. (2014) Relating Systems Thinking and Design 1. Practical Advances in Systemic design, Formakademisk Vol 7, No 3, Oslo

---

Putting the horse in front of the wagon: how a multi-contextual design space successfully addresses complex challenge.
Wouter Kersten, Jan Carel Diehl and Jo van Engelen

Thursday 11:00. Room A3.

context variation

complexity

rich design space

What's going on?

We observe that designers who want to address complex issues are currently often falling for the temptation to fight this complexity with simplification. They acknowledge that there are differences between contexts (e.g. user groups, countries) and to address this, they zoom in on one specific context. This enables them to develop a solution that works in that specific context. After this has been achieved they start working on variations for new contexts. This strategy may look appealing, but seems to satisfy a desire for management control rather than address a real life issue. Complex situations seem complex for a reason: reality is complex. Simplification by focusing on a beneficiary group in one context has several consequences which together clarify why it is the wrong response. We mention a few of these consequences:

• Heads down design: Simplified issue analysis results in incomplete views, which is certain to result in limited quality of 'solutions'. If at all useful then only for a limited group, a small part of the issue and/or a short duration in time.

• Path dependency: Any next step to improve the starting solution will be a small variation on the first step, even if next steps, e.g. involving new beneficiary groups, in fact require a different way of looking at the situation and quite different 'solutions'

• Early zooming reduces the solution space: Since complexity is characterised by many elements, and many interactions taking place, will severely reducing the number of connections lead to something meaningful? Can we think of an alternative?

Alternatives are possible and several authors have provided thoughts on this. Below we list a representative while not exhaustive summary:

• Accepting the reality of contemporary society being complex is the first step in enabling yourself to deal with it: "fight complexity with complexity" (Stacey, 1996)

• Move beyond simply putting (human) users central as the solution, but apply more systemic thinking throughout (Jones, 2014)

• Information that is novel to you, i.e. enriches your overall view, is more likely to reside at or over the edge of your network than in the centre (Sunstein and Hastie, 2015).

• 'Complex Adaptive Systems' are able to adopt and evolve with changing circumstances which is arguably the most important characteristic to cope in a rapidly accelerating society (Friedman, 2016).

• Especially when still in issue definition phase, consider the concept of (re)framing (Dorst, 2015), but refrain from being satisfied with just using that concept. Ask how reframing can be nudged in a direction that is likely to be useful. "Reframe!" is not a helpful guideline. We may need to provide better guidance on how to reframe to be able to address complex issues. One important element is that it requires multiple perspectives. In practice, involving different (types of) people to be able to actually reframe (Suen, 2015).

• While moving from single-angle to collaborative inquiry is a good step, the move we really need to make is to shared inquiry, to arrive at true integration of multiple perspectives and in that process start seeing new emerging patterns (Nelson, 2014).

• From research with junior designers it became apparent that to source inspiration that turns out to be relevant, this inspiration should neither be too close (i.e., too obvious) nor too far (i.e. really arbitrary) removed from the challenge at hand. (Gonçalves, 2016). However, they often do not get much guidance how they might achieve this. Can we combine these alternative thoughts?

The above provides ingredients for a way forward when dealing with complex design challenges. We

propose an approach and associated attitude that takes these thoughts one step further: Context Variation by Design (CVD). It combines four main principles to shape the analysis: systematic variation including of networks, hierarchical decomposition, satisficing and discursiveness. These principles interact and create a rich solution space that allows crucial connections to be revealed by avoiding early simplification. A central construct in this approach is to aim for multi-contextual richness of the design space. Richness as a design construct is a little researched area. Our work intends to change that because we feel it is key to addressing complexity. We elaborate elsewhere. What might this approach add for designers (and others)?

What does CVD-thinking add to a designer's arsenal? We argue that it adds this: recognising that in order to work with the multiformity of many challenges and allowing connections (hidden or otherwise) to be revealed, systemic principles need to be combined with early systematic variation. We consider our key message to be that instead of early simplification and late variation, we should reverse the dynamic: early systematic variation (products, markets, networks) and if still necessary save simplification for later, e.g. by starting implementation in one context first. Examples of what we can expect when we focus on richness of design spaces are: building in 'doors' for future requirements, realising that key requirements in one context are still desirable for other contexts and introducing connected multi-context business models.

In summary

When analysing and considering a complex societal challenge, draw facts, opinions and insights from multiple contexts into one design space to create a rich analysis of the possible issue, as basis for a platform for solution directions that as a whole cater for requirements from a range of different end-user environments. By approaching the challenge in this way,

• One has direction for reframing (preventing too one sided formulation of the challenge), enriching the concept of Dorst.

• One can use systemic design principles combined with a practical issue, connecting to the work of Jones.

• One has guidance on whom to involve in a shared inquiry, enabling Suen's ideas,

• One has guidance on where to source inspiration, building on Gonçalves' work and giving direction on how to decide where to look.

• One creates a design space from which contextual adaptations will be easier to accomplish, addressing worries by Friedman.

• One creates more space for integrated pictures and emergence (Stacey, Nelson) with lower risks of heads down design (Meyerson) and of path dependencies based on early simplifications (Jones)

Sustainable System Design.

Andres Pineda, Ulrik Jørgensen and Erik Hagelskjær Lauridsen

Thursday 11:30. Room A3.

sustainability

socio-technical

system design

In this paper we present the motivation, rationale and methodological outline of a framework for designing sustainable systems. The proposal builds on a discussion that draws on literature from the fields of: Sustainable Transitions, which claims that the necessary transformations of our modern technological systems require paradigm shifts and thus systemic change; Design, which have enriched the scope, scale, and character of objects of design overcoming the limited focus on products to embrace service systems, social innovation and transition design (Irwin, 2015); systemic thinking which has taken up the challenge and need to support design projects at different levels (Ryan, 2014); and socio-technical change, that has contributed with widely adopted theories and methods to analyse technologies in context as socio-technical networks (Latour, 2005). The result is a three stage meta-methodology that guides the collaborative process of designing new mid-range systems like local energy systems, neighbourhood recycling systems and cycles of circular economy for products. We will illustrate the analysis with the presentation of four exemplary projects from students where different aspects of systemic change are salient: inter-systemic dynamics (Blåvoulevard, 2015; Affasldsystem AFK, 2016); intra-systemic dynamics (Energi Sydhavenen, 2016) and circular economy (Ikea, 2016). These projects are developed by students at the 5th semester of the BSc Sustainable Design Engineering, however the aspects discussed here on system design are relevant for the whole education and for the MSc in Sustainable Design Engineering.

Irwin, T. (2015). Transition design: A proposal for a new area of design practice, study, and research. Design and Culture, 7(2), 229-246.

Latour, B. (2005). Reassembling the social: An introduction to actor-network-theory. Oxford university press.

Ryan, A. (2014). A Fram

The power of trust and motivation in a designing social system.
Mieke van der Bijl-Brouwer

social systems

social design

design expertise

design relationships

design management

The world is increasingly faced with open, complex, dynamic and networked problems (Dorst, 2015), which result from a highly connected world (Manzini, 2015). Over the past decade, many have turned to design practice to address these problems, which has led to promising results, but at the same time has also revealed many challenges and constraints. For example, designers have been critiqued for failing to successfully implement ideas (Mulgan, 2014; Norman & Stappers, 2015).

In this paper I take a social systems view of design. Traditionally, design has been described as a social process within a design team (Badke-Schaub, Neumann, Lauche, & Mohammed, 2007; Dorst, 2006). However, the application of design in addressing complex issues has moved design beyond the boundaries of the design team, to what Manzini (2015) calls 'designing networks': a distribution of design processes among numerous actors who differ in culture, motivation, and professional development. As such, designing becomes part of a social system.

A social system is a whole that cannot be divided into independent parts, and within this system both the parts – human beings – and whole are purposeful (Ackoff & Emery, 1972). Social systems theory focuses on the relationships between people (Stacey, 2006). A social systems view of designing could provide support for the development of successful design strategies for complex social problems. To achieve this we need a better understanding of the people and the way they relate to each other in a 'designing social system'.

In this paper I will explore the roles of the human beings that are part of a designing social system, and the way the relationships between these people can be characterised and shaped. The successful application of design requires at least the following capabilities:
• Decision making about investment in design processes and implementation of outcomes
• Design expertise, ranging from novice or naïve to expert or visionary (Lawson & Dorst, 2009; Nelson & Stolterman, 2012)

• Domain expertise about the problem space and feasibility of implementation of solutions.
In a complex social system these roles are distributed over multiple people within different stakeholder groups such as the design team, funders, service deliverers, end-users and service organisations.
To develop an understanding of design within social systems we conducted five case studies of contemporary social innovation agencies in Europe, North America, and Australia. The case studies show design practices in relation to different levels of expertise and impact:
• Local level design: design practitioners who design and implement interventions locally, for example service deliverers: they have a basic level design expertise, high level of domain knowledge, and agency to make decisions within their local context.
• Systems level design: design practitioners with high-level design expertise who rely on interactions with domain experts and decision-makers to develop initiatives that create change on a systems level.

THE ROLE OF TRUST AND INTRINSIC MOTIVATION IN A DESIGNING SOCIAL SYSTEM
The relationships between the people who played a design role in the case studies were explored through phenomenological themes, which describe the structure of the lived experience of the people who participate in the design process (van Manen, 1990). The case studies showed that the themes of trust and intrinsic motivation played a key role in shaping the relationships within the designing social systems, and through that in the success of the investigated projects.

TRUST
On a systems level, trust played an important role in the relationship between decision-makers and expert designers in all five case studies. Trust was essential as designing on a systems level can be a very uncomfortable and uncertain process. This trust was achieved in different ways across the case studies through building long-term relationships, building credibility, and a carefully designed open and participative communication process.
On a local level, trust was key in the relationship between decision-makers and the local designers/ domain experts. In those cases where decision-makers provided domain experts with the agency and capability to design initiatives for their own practices, a high level of trust was experienced mutually. In one case study this level of trust was achieved through the design of what I have previously called a 'social infrastructure' (Author, 2016), a structured way of connecting and empowering people to incrementally improve their service.

INTRINSIC MOTIVATION
Intrinsic motivation drove people in the designing social system to make a difference. The themes that are related to intrinsic motivation are described by (Pink, 2009) as mastery, purpose, and autonomy.
Mastery (or growth): opportunities to learn drive people's motivation to contribute. All case studies included capability building of decision-makers and domain experts, through training or active participation in the project. The relationship between growth and motivation is reciprocal: the learning opportunity drives motivation, and motivation is essential for learning.
Purpose: all participants wanted to make a difference. Purpose-driven decision-makers played

an important role in each of the client organisations in making sure that the design process and design outcomes were implemented. To maintain a sense of purpose decision makers were involved in design, which allowed them to see what the impact was of their decisions. Autonomy (or agency): being able to implement your own design is highly motivating. In one of the case studies service deliverers were provided with the agency and capability to redesign their own practice, which had a profound impact on their mindset and how they experienced their work.

DISCUSSION
Current ways of problem solving fail to address the dynamic and networked nature of problems. Problems are often addressed in a rational and top-down controlled manner, resulting in slow processes, demotivated employees and service deliverers, passive end-users and sub-optimal solutions, which prevent successful implementation. In the view presented in this paper, people within a dynamically designing social system continuously design and redesign interventions on a local and systems level, supported by trusted relationships. A better understanding of the relationships between these people and their capabilities will contribute to the development of structures for organisations and networks in which people are empowered to make a difference through design.

Systemic Design Approach on Water Management.
Dario Toso

Thursday 15:30. Room A3.

Systemic Design

Water

Exclusion Zone

The here presented abstract examines how the adoption of the Systemic Design methodology has led to some interesting and unexpected results during the design process of an alternative water treatment for domestic purpose.

The rapid evolution of the worldwide scenario, the climate change, biodiversity loss, resources depletion and rapid technological and social development called for a radical response from the design community. Anthropogenic pressures on the Earth System have reached a scale where an urgent change of route towards sustainability is inescapable. At the same time, the

understanding of the raising complexity in natural and social systems, resulting by the discoveries occurred during the last century in Physics, Cybernetics, Biology, etc. made the reductionism view inadequate.

Therefore, the Systemic Design (SD) methodology results as a supportive tool for helping the designer to look at the objective in its complexity and to organize all the actors of the project by giving them the ability to relate and evolve autonomously.

As a consequence the individual parts of the system are intertwined, forming a virtuous network (autopoietic) of relations between the flows of matter, energy and information.

In particular the SD methodology here adopted has been developed at Politecnico di Torino with the aim of implementing sustainable productive systems in which material and energy flows are designed so that waste from one productive process becomes input for other processes, avoiding being released into the environment. This model is inspired by the theoretical structure of generative science, according to which every modification in resources generates by-products which represent an added value.

Starting from the observation of natural phenomena, the SD approach aims to "learn from nature" not just for mimicking the natural technologies, but for designing a product system able to positively interact with a dynamic environment and an evolving society.

The application of the SD methodology to the design of a water treatment entailed a focus on the understanding of the water behavior both at molecular and at macroscopic level.

It is well know that water is one of the most abundant resources on Earth and it is inextricably linked to life. The majority of natural phenomena involve water and our existence is dependent on this precious substance, or the lack of it. However water is limited and despite of its ability to self-cleaning along the water cycle, its quality is vulnerable and fragile. Hence, water scarcity and water pollution represent tremendous issues at global level that call for rapid solutions. Therefore sustainable management of water resources is one of the largest commitments to the international community for the coming years.

The state of the art of the methods used to disinfect and decontaminate water and to reuse wastewater or to desalinate seawater, is working in concert to improve health, safeguard the environment, and reduce water scarcity. However, despite modern science is able to investigate water very deeply and even though the efficiency of water purification technologies has increased tremendously in the latest years, many properties of liquid water still remain incompletely understood. Yet, a more profound comprehension of the water behavior can lead to turn the light on the many mysteries of this incredible substance.

The SD methodology drove the research through an intense exploration of the complex properties of liquid water touching a variety of disciplines from physics to chemistry until bioengineering and medicine that has opened the frontiers to a more holistic understanding of water.

As a consequence we got in touch with some of recent theories from physics, biology and biochemistry, that have cast a light on some new properties and behaviors of water able to dramatically change the perspective on which we use to consider this incredible resource.

In particular the recent hypothesis about the liquid water biphasic structure according to

quantum field theory and the evidence of the so called Exclusion Zone (EZ) in the vicinity of hydrophilic surfaces, have inspired the design of a "filterless filter" which has the capability of filtering contaminated water using the EZ phenomenon instead of a physical filter. The separation process is driven by incident light energy, which builds the EZ and thereby excludes the contaminants. It is a self-cleaning process that involve a behavior of water in the vicinity of hydrophilic surfaces that occurs naturally at ambient temperature and pressure.

Therefore, the research started from the exploration of the liquid water abilities in self-cleaning and self-organization at molecular level, and leaded to the design of a water system that drastically reconsiders the water usage at domestic level.
The new house system is here considered as a "living organism" where water is treated using membrane-less and chemical-free purification modules that take advantages of the spontaneous solutes rejection in the vicinity of some hydrophilic surfaces or in a free-vortex.

Systemic map to revitalizing local knowledge in autochthones communities.
Ana Luisa Cavalcante and Francisco Fialho

Thursday 16:00. Room A3.

LOCAL KNOWLEDGE

Design for Cultural Sustainability

Knowledge Management

Demand for construction of systemic map / infographic allowed the questioning, understanding, and the future replication of the local knowledge revitalization system in an Indigenous Land in the State of Paraná (Brazil) whose purpose was to promote the sustainability of culture. Thus, was organized visually the Local knowledge management process. In the collaborative organization, the indigenous is considered a producer of the local, collective, traditional and contemporary knowledge and is part of a dynamic process sociocultural. Planning procedures and compliance with the steps that are relevant to the suggested process of revitalization are presents, namely: Knowledge kind definition (Input); Interdisciplinarity; Research subject; Process steps of the Local Knowledge Management; Proposals (output). This steps are sinthetized in an infoghraphic that show the results obtained of research that structures resources for the construction of local knowledge revitalization system with emphasis on graphic and visual representation in order to contribute to the cultural sustainability of indigenous communities of practice.

Open mind and open heart: Two approaches for exploring the dynamics in stakeholder networks in complex co-design projects.
Remko van der Lugt

Stakeholder networks

Constellations

Gigamapping

Exchange values

In co-design projects, it is imperative to gain an understanding of the dynamics in the stakeholder network, to get a sense on which stakeholders to involve when and in which ways, in order to enable an effective collaborative innovation effort.
Many tools are available regarding stakeholder analysis, primarily stemming from business development. A well-known way is to set out in a graph the interest and importance of other organizations in order to identify how to deal with these. Other stakeholder mapping approaches identify relations and interdependencies in the stakeholder network (e.g. Den Ouden, 2012). From a systemic perspective, such approaches are of limited in various ways. They tend to: 1) focus on direct interest of the own organization, rather than the needs of the network as a whole,
2) have a bias to exchange of (monetary) value, rather than acknowledging the broad spectrum of contributions that stakeholders can bring to each other.
3) limit the investigation to the direct stakeholders, rather than getting a sense of the 'larger whole'.
4) regard the stakeholder network as a solid state, rather than a dynamic system. In order to deal with these issues, we have explored two alternative ways of getting a grip on stakeholder networks.
The first approach addresses the lack of a sense of the whole stakeholder system, by combining aspects from Gigamapping (Sevaldson, 2011), which aims to provide understanding through constructing overview of the system as a whole, with a broad understanding of value exchange inspired by Pierre Bourdieu's broad understanding of forms of (cultural) capital, which we developed towards a series of 8 exchange values (Economical, Embodied, Materialized, Institutional, Social network, Status/reputation, Information, Experience, Personal motives) that can help to get a sense of the value exchange in the stakeholder network, as well as potential dysfunctionalities and patterns.
The second approach addresses the dynamic aspects of the stakeholder network, exploring movement and forces in the system as a whole. Here we bring in the systemic phenomenological approach of constellation work. This approach was developed by Bert Hellinger for family constellations, but is

increasingly applied in organizational settings (e.g. Stam, 2012). These constellations can be set up with people as representatives, or with objects, depending on what the situation asks for and allows. When related to the three mindsets in a Theory U change model (Scharmer, 2009), the first approach addresses the 'open mind', and the second the 'open heart and open will'. In this paper, we will describe these two approaches, and grounding them by both theory and by various cases in which we applied them in design projects. For instance, we applied both approaches in a project on stimulating individual households to recycle cooking oils Based on a structured reflection on our experiences, we describe the potential applicability and benefits of these tools, as well as the liabilities. We share first insights regarding the ways in which these tools approaches may inform designers (and stakeholders) involved in systemic design challenges. We explore possibilities of combining the tools together in a project, and how this can strengthen or hinder insight. Finally, we will also provide directions for further development and research. NOTE ON DELIVERY: If possible I would love to present this work as a workshop, rather than, or in addition to, a presentation. REFERENCES

Bourdieu, P. (1984). Distinction: A social critique of the judgement of taste. Harvard University Press. Den Ouden, Elke (2012). Innovation Design: Creating Value for People, Organizations and Society. Springer Science+Business Media, London. Scharmer, O. (2009). Theory U. Berrett-Koehler Publishers

Sevaldson, B. (2011). GIGA-Mapping: Visualisation for complexity and systems thinking in design. In Nordic Design Research Conferences, Making Design Matter. Helsinki: NORDES.

Stam, J. J. (2012). Fields of connection: Systemic insights into work and organisations Groningen: Het Noorderlicht

---

Changing behavior of the systems we're in: Designing for transitions in Environment, Economy, and Democracy.
Francis Carter, Silvia Mata-Marin, Dimeji Onafuwa, Ahmed Ansari and Dan Lockton

Thursday 17:00. Room A3.

behavior change

practices

systems

transition design

second-order cybernetics

bordering

commons

urbanism

Emerging approaches to designing for societal transitions toward more sustainable futures (e.g. Irwin et al, 2016; Mulder & Loorbach, 2016) involve methodological commitment to engaging with complex sociotechnical systems—the value of a systemic design approach is being recognized in considering everyday practices, from bathing (Kuijer et al, 2013) to food (Barbero, 2015).

However, much systems work focuses on mapping actors and relations, while in transition the dynamic nature of relationships, and how to intervene, is crucial. There is value in a second-order approach, recognizing that we are within the systems we are trying to change: "everything said is said by an observer" (Maturana, 1975:324); "the designer never stands outside the situation" (Dubberly & Pangaro, 2015:78). At RSD3, Ranulph Glanville (2014:3–4) noted, paraphrasing Charles François, in relation to the "typical sort of systems diagrams with boxes here and here and here and here and arrows connecting them", that "Systems people are interested in the boxes and cybernetics people are interested in the arrows." We recognize that design's role is in enabling people experiencing transitions to have agency to change the behavior of the systems they are in: to affect those arrows between the boxes, to exploit relations and seed potentialities within situations. Systems-in-change have been explored before, particularly actors' agency toward systemic goals (Beer, 1972), but we derive an alternative approach from the concept of efficacy in Chinese philosophy (Jullien, 2004), and dunamis or potentiality from Aristotle's Metaphysics. Designing for transition in systems can be seen to involve creating future scenarios through a close read of the present, and to enact change through the transformation of opportune situations.

In our paper, we examine three cases covering making sense of, and affecting, sociotechnical systems-in-change, dealing with permeability of boundaries, agency in effecting intrasystemic change, and differences of experience, but with a common theme of manipulating the present in order to seed the future with many emergent possibilities. In Case 1, migrants experience their behavior being changed by the system; in Case 2, people negotiate how to redraw boundaries to change the behavior of a system; while in Case 3, people are enabled to perceive and enact their agency in changing the behavior of the system.

Case 1: Democracy: Experiencing systems and artifacts as bordering

As the world's population faces an accelerating state of flux, nation-states' borders have failed to regulate and control access of people. This control vacuum has been filled by other sociotechnical systems that are part of everyday life, from drivers' licenses to credit cards; systems are adopting bordering qualities (van Houtum, 2005), constantly re-defining the separation between communities. This leads to tensions between the practice of reinforcing borders—by dominant political interests that seeks to divide and exclude—and practices of border crossing—by migrants that seek to integrate.

Sociotechnical systems embody politics of difference aimed at excluding populations from public life; mobilization, fiduciary exchange, public services are often made unavailable depending on migration status. Exclusion from social spheres of public life has led to migrants adopting practices and changing behaviors with the purpose of navigating and crossing these barriers on an everyday basis. Understanding that the current and future state of the world is one that will be defined by massive flows of migrants—as a response to other global crises (environmental, political, social)—it becomes imperative for designers to think about systems and their role in normalizing politics of difference that affect matters of self-determination and agency for migrant populations.

Case 2: Economy: Design-Enabled Recommoning

We are facing global crises with resources of our collective livelihood, such as water, data and housing. Decline in the availability of these "common resources" is leading to research in new ways of platforming resource use negotiations. Commons represent resource and social systems as well as the practice of managing such resources. They occupy the margins between public and private ownership, and they change the conversation from ownership rights to participation and co-ownership. Commons have clearly defined boundaries that ensure reduced participation costs for commoners as well restrictions for free-riders, who may benefit at the expense of others. For commons to avert system collapse, they need permeable boundaries—open enough to sharing, to relationships, and interactions—but closed to overwhelming external disruptions that may lead to failure (Stavrides, 2016). Boundaries are demarcations represented in rule enforcement (Ostrom, 2015). These rules may pertain to everyday life decisions, may relate to participation eligibility, or they may be enacted to help determine the levels and forms of governance needed.

Luhmann (1986) argues that social systems are new forms of autopoietic systems because they self-reproduce. Communication determines the vitality of such socially autopoietic reproduction—without communication, there is no relationship, and without relationships, boundaries defining the communities degrade. However, social systems are not purely based on communication—humans have agency in building the limits of such relationships. Their changing behaviors continuously redraw the boundaries around social systems.

Case 3: Environment: Constructive Contradictions

Tactics are opportunistic, designed responses to strategies of the status quo which seek to meet the unmet needs of those enacting them. Self-provisioning refers to acts people are "compelled to do out of necessity, since existing market practices and government policies did not meet their basic needs." (Kinder 2016:5-6); a tactical, often informal, response taken by an individual or community, striving to have "powerful effects on local quality of life" (Kinder 2016:28). A place-based, "best response" (Slee, 2006) to current circumstances acts as a constructive yet temporary solution, serving a meaningful purpose for self-provisioning within the current context.

Practices of "everyday urbanism" (Crawford & Speaks, 2005) represent alternative ways of designing that contradict top-down systems. These acts of subversion produce alternative moral geographies—cultural landscapes where certain people, practices, and objects appear to belong and others do not (Cresswell, 2005); these constructive contradictions challenge existing social value structures by proposing practices offering more meaningful action in the world. They introduce play into existing systems by identifying gaps in social services and leverage underutilized resources to overcome those gaps, involving an understanding of the problem space from within the system.

References

Barbero, Silvia (2015). Systemic Design for Food Sustainability: Interpretation of real cases and reflection on theories. Proceedings of RSD 5 Symposium: Relating Systems Thinking and Design, Banff.

Beer, Stafford (1972). Brain of the Firm. Allen Lane, London.

Brewer, Jennifer F. (2012). Don't fence me in: boundaries, policy, and deliberation in Maine's lobster commons. Annals of the Association of American Geographers 102 (2), 383-402.

Crawford, Margaret and Speaks, Michael (2005). Everyday Urbanism: Michigan Debates on Urbanism Vol 1. Distributed Arts Press, New York.

Cresswell, Tim (2005). Moral Geographies. In Atkinson, David, et al (eds.), Cultural Geography: A Critical Dictionary of Key Concepts. I.B. Taurus, London, 128.

Dubberly, Hugh and Pangaro, Paul (2015). Cybernetics and Design: Conversations for Action. Cybernetics and Human Knowing 22 (2–3), 73-82.

Ehn, Pelle, and Badham, Richard (2002). Participatory design and the collective designer. PDC 02: Proceedings of the Participatory Design Conference, Malmö, 1-10.

Glanville, Ranulph (2014). How Design and Cybernetics reflect each other. Transcript of keynote at RSD3 2014 Symposium: Relating Systems Thinking & Design, Oslo.
van Houtum, Henk (2005). The Geopolitics of Borders and Boundaries. Geopolitics 10 (1), 672-679.

Irwin, Terry, Kossoff, Gideon, and Tonkinwise, Cameron (2016). Transition Design Provocation. Design Philosophy Papers 13 (1), 3-11.

Jullien, François (2004). A treatise on efficacy: between Western and Chinese thinking. (Trans. Janet Lloyd). University of Hawai'i Press, Honolulu.

Kinder, Kimberley (2016). DIY Detroit: Making Do in a City without Services. University of Minnesota Press.

Kuijer, Lenneke, de Jong, Annelise, and van Eijk, Daan (2013). Practices as a unit of design: An exploration of theoretical guidelines in a study on bathing. ACM Transactions on Computer-Human Interaction 20 (4), art.21.

Luhmann, Niklas (1986). The autopoiesis of social systems. In: Geyer F. & van der Zouwen, J. (eds.) Sociocybernetic Paradoxes, Sage, London, 172-192.

Maturana, Humberto R (1975). The Organization of the Living: A Theory of the Living Organization. International Journal of Man-Machine Studies 7, 313-332.

Mulder, Ingrid and Loorbach, Derk (2016). Rethinking Design: Transition Design as a critical perspective to embrace societal challenges. Position paper at Transition Design Symposium 2016: Can Design Catalyse the Great Transition?, Dartington.

Ostrom, Elinor (2015). Governing the Commons. Cambridge University Press.

Slee, Tom (2006). No One Makes You Shop at Wal-Mart. Between the Lines.

Stavrides, Stavros (2016). Common Space: The City as Commons. Zed Books.

Urbanism

Imagining Transitions: Designing a Visioning Process for Systemic Urban Sustainability Futures.
Idil Gaziulusoy and Chris Ryan

Thursday 11:00. Room A1.

urban transitions

systemic design

design for sustainability

Australia

Cities have become the locus of socio-technical and socio-ecological transition processes aimed at achieving sustainability. Sustainability transitions are defined by structural changes unfolding across different phases with varying pace and a large number of diverse actor-networks engaging over long-term. With these characteristics, transition projects are archetypal examples of wicked problems both during their conception and execution. The shift in transitions theory and practice from a sectoral focus to a focus on cities increased the systemic complexity that needs to be considered in transition projects with methodological implications. This paper reports and reflects on the design of a visioning process used in the front-end of Visions and Pathways 2040 project; a project that aimed at developing visions, scenarios and pathways for transitioning to low-carbon and resilient futures in Australian cities. Visons and Pathways 2040 project adopted complex adaptive systems view of cities avoiding considering city support systems in isolation from each other or from the built, social and natural environments they are embedded in. The visioning process engaged professionals, researchers and designers to build systemic visions in five iterative rounds in a half-day workshop. We discuss what we have achieved

---

Visualizing the Sociotechnical System as an Urban Democratic Resource; the iCity case study.
Jeremy Bowes, Manpreet Juneja, Carl Skelton, Sara Diamond, Marcus Gordon, Cody Dunne, Davidson Zheng, Steve Szigeti and Michael Carnevale

Thursday 11:30. Room A1.

The increasing dependence of individuals on socio-technical and technological systems in urban life today, has provided an enormous amount of data that reveals user stories, and provides individuals with choices around how they integrate these systems into the quality of their urban life. Visualization and visual analytics tools can provide critical support for researchers, designers and stakeholders to understand these democratic choices related to human activities. Correlating and representing quantitative data from human actors provides insight, explanations for patterns and anomalies that aid in decision support as a democratic resource.

The iCity urban transport project focuses on the development of data analytics transportation and transit planning tools that could increase individual and community participation to the development, planning, and design of transportation systems interfaces as a democratic resource. Through the combination of social media and mobile data with GIS, demographic, socio-economic, and transit data iCity researchers use tools to develop evidence-based User (persona) and Use types (scenarios) through data collection and form stakeholder and related individual user and community engagement profiles. As an interactive system resource iCity sets out the conditions for individuals and groups to highlight their needs /wants /values, participate in strategic planning opportunities as a democratic resource to realize outcomes.
In this way designers and users can identify requirements, provide expertise around more general and fundamental matters of quality, equity, and social values, and a perspective rooted in the experience of urban systems as human experiences. This paper focuses on the comparative methodology and integration of user needs to create a more democratic system resource.

Future Fest: a design concept for deliberative engagement in the urban planning process.
Christopher Pearsell-Ross

Thursday 12:00. Room A1.

systems oriented design

systems

design

democracy

deliberative democracy

urban planning

participation

giga-mapping

This paper presents the research and analysis process, and results (the Future Fest concept) of a school project in the 2016 Systems Oriented Design course at the Oslo School of Architecture and design, as well as some critical reflections. Taught by Birger Sevaldson and Linda Blaasvær, the course focused on the theme of democracy, and partnered with Tønsberg municipality in Norway.

The research process and design proposal from this course are built on 4 conceptual models: the Three Horizons Model, as presented by Curry and Hodgson; the Pace Layers model, as developed my Stuart Brand; the Ladder of Citizen Participation, created by Sherry R. Arnstein; and a model of deliberative democracy proposed by the author.

The Three Horizons Model, developed by Curry and Hodgson in their paper Seeing in Multiple Horizons: Connecting Futures to Strategy, connects systems and futures studies. It outlines an approach to futures studies built upon outlining 3 separate horizons: the present; the desired future; and an intermediate or transitionary stage. This method allows for divergent possibilities and takes into consideration different speeds of change within a system.   Stuart Brand's Pace Layers model, developed from architectural practice, is a concept that outlines different layers within a given object of study (be it a building, a company or the whole world), each with different speeds of change. The model allows for analysis of change within a given system across multiple, interrelated time scales.

Arnstein, in her paper A Ladder of Citizen Participation, develops a foundational theory model of participation as an 8-runged ladder, moving from non-participation at the bottom, through tokenism in the middle, up to citizen power at the top. Her model highlights the diverse range of participatory practices and establishes a normative hierarchy for practitioners working in the public realm.

The author also presents a self-generated model of deliberative democracy, breaking down elements of a healthy, functioning democracy into four categories: formal structures, such as legislative assemblies; institutions, such as human rights and a free press; situations, such as high voter turnout, economic stability, and diverse political debate; and principles or ideals, such as consent, equity and self-determination. These four categories can be seen as blocks stacked on top of one another, reaching to the height of a healthy democracy. If the tower is unbalanced, democracy can be seen as unstable. This model helps to locate design projects and interventions within a range of interrelated systems within the broad concept of democracy.

These conceptual models were used to create a research agenda and theoretical framework for problem definition and concept generation, focused on deliberative democracy and participation in the urban planning process. Working with Tønsberg municipality as a context, a

week long site visit was conducted, with interviews and meetings with various stakeholders the municipal government, including city planners.

Giga-mapping was then used as a tool to develop an understanding of the complex system of participation in urban planning, and a zip analysis was implemented to identify key areas for further research and potential intervention and innovation. Building on this systemic understanding, a series of semi-structured stakeholder interviews was conducted. These interviews helped to identify 5 key priorities for any design intervention: communication, trust, knowledge, capacity, and accountability/efficiency.

With these key priorities identified as conceptual goals for a design process, ideation and concept generation began. Through sketching and modelling, a series of 34 potential design concepts were developed and then analyzed in a matrix, weighing variables such as systemic impact, synergies, thresholds, the 5 key priorities, and time frames. The Future Fest concept emerged as a clear front-runner, having low thresholds to implementation and high levels of potential systemic impact.

Future Fest is envisioned as a collaborative, open-platform festival bringing together members of the public with cultural, institutional and municipal partners to reconceptualize the culture of participation around the built environment and municipal planning process. By applying the 4 conceptual frameworks as lenses to the learnings from the site visits and interviews, the culture of participation itself was identified as the critical locus for a design intervention. Cities are already hotbeds of activity and engagement – just not necessarily in the formal processes of civic consultation.

By moving the fences, as it were, to include a broader range of participatory activities, led by a broader range of individuals and groups, the Future Fest concept hopes to normalize participation and engagement with the urban planning process. By situating the formal processes of participation (many of which are mandated by law) within a vibrant, diverse and open community context, it is hoped that a stronger culture of participation and engagement can be cultivated, broadening civic engagement, and at the same time diversifying the kinds of activities and inputs that are valued by the public service and political leadership.

Housing Horizons: Models for Real Estate and Community Investment.
Adrienne Pacini and Helen Kerr

Friday 11:00. Room A1.

affordable housing

housing system

foresight

systems thinking

community-building

Toronto's housing system is in crisis. As we persist in maintaining this failing system, we are limiting ourselves to the possibility of creating transformational change. Toronto's housing arena is a complex organism of competing interests and influences, reinforcing a stratification between those who benefit from it and those who do not. With limited housing choices, many Torontonians are left with few opportunities to invest in their communities and to generate personal financial wealth for their futures. Through foresight methods, systems analysis, and generative design research techniques, this project asserts that we can create change in Toronto's housing system by transforming real estate investment from an asset into an inclusive and democratic community-building tool. Housing Horizons begins by describing the evolution of the housing arena in Canada and analyzing the dynamics at play in the current system. The research then proposes several design principles for innovation: shift the power in the development industry to smaller community-based players, create wealth-generating mechanisms suitable for renters, and foster collaboration across stakeholders in the system. A city where all citizens can thrive is only possible when the housing system contributes to the wellbeing of its entire population – this vision can be realized through strategies that level the playing field for all.

Landscape of Emerging City Makers: the case of Rotterdam.
Jotte I.J.C. de Koning, Emma Puerari, Ingrid J. Mulder and Derk A. Loorbach

Friday 11:30. Room A1.

Transition Management

Sustainability

Participatory Design

Third Sector

Urban Planning

Cities are increasingly complex environments that inhabit different kind of people and groups that perform different kind of activities. The increasing complexity brings along challenges for the future sustainability of cities. Government, planners and architects are traditionally in charge of planning and tackling the challenges within cities. However, today, citizens and people of other professions also contribute to the debate; and not just that, they take charge, stand in the lead and are front-runners of the sustainable transition of a city. These non-traditional groups of city makers are sometimes referred to as bottom-up initiatives, grass roots or voluntary citizen initiatives; other terms to describe them are civil society, social enterprises, non-profit organisations (NPO) or non-governmental organisations (NGO). The boundaries between these terms are often blurred and used interchangeably (Simsa, 2013). Often these different groups are congregated under the general term third sector. The third sector does not have a specific theorization, or at least not one as established as the state or market (Corry, 2010). The goal of this paper is to characterize the new emerging types of city makers in the context of urban sustainability transitions, where governance creates space for "short-term innovation and long-term sustainability visions linked to desired societal transitions" (Loorbach, 2010, p.163).

An initial categorization is presented to allow for stretching the transformative capacity of these new city makers towards flourishing and sustainable communities.Context

This study of initiatives is executed in the Netherlands where the third sector is characterized by highly active initiatives that are visible in various policy fields (Pape & Brandse, 2016). The urban scale is the lens, often the scale the initiatives operate in, ranging from streets, to neighbourhoods, parts of the city or the whole city and sometimes beyond. Rotterdam, the second largest city in the Netherlands, is the specific case study city. It is recently receiving attention for its transformative energy and as a breading ground for new city initiatives.

Data collection method

A list of 152 initiatives i¬¬n Rotterdam was collected over the course of six months. The goal was to collect basic information to allow identification and description of themes, topics and types of initiatives. In the literature background, an overview of the different definitions and inclusion and exclusion criteria for third sector initiatives will be given. For the data collection process these criteria have been used as inclusion criteria rather than exclusion criteria. This way the literature framed the data collection process and provided a board scope. However, there was a second criterion during the data collection of initiatives: on contributing to sustainability transitions. Again, this was considered in the broader sense and more an inclusion than exclusion criterion. The sustainability transitions contributions criteria included contributions to environmental and social sustainability, of cities, people and systems that connect them.

Results

The data of the 152 initiatives allowed the identification of 10 types of initiatives that contribute to sustainability transitions in the city of Rotterdam. The 10 types of initiatives or 10 'types of city makers' can be found in Table 1: categorization of types of city initiatives. Second, the 10 types are mapped according to their participatory focus in the city and their contribution to the sustainability transition of the city. The results of this mapping can be found in Figure 1: Mapping of the 10 types of city initiatives according to their participatory focus and their sustainable innovation focus.

Discussion and conclusion
The 10 types of city makers show that the landscape of emerging types of city makers is indeed diverse. If all the different actors would be aggregated under one general term and other stakeholders would address them according to the same criteria, specific qualities of each type could be lost. The mapping of the 10 different types of initiatives shows a variation in qualities according to two axes. Different axes could have revealed other variations in qualities but these axes were chosen also in light of the following conclusions that propose a more participatory way of working towards sustainability transitions. The goal of the mapping was therefore dual: to show the variety and to point towards emerging city makers for a more participatory focus in the sustainability transition of cities.

To conclude, the new types of city makers are valuable for the sustainability transitions in general but more participatory networks could benefit cross-overs and accelerate the transitions towards sustainable futures. However, the different types should not be treated as one and the same, they should all be nurtured and stimulated for their specific qualities. New approaches should be able to include these different types of initiatives in the city making process. The interconnectedness and complexity of the different old and new city makers calls for more holistic, participatory and systemic approaches to creating solutions. These approaches need yet to be developed and systems thinking and design could greatly contribute to the development of these new systemic and participatory approaches. In order to develop these new ways of 'participatory city making' it is important to understand for whom and with whom these approaches need to be developed. Therefore, this landscape of emerging city makers that participate and contribute to the sustainability challenges of cities can be seen as a starting point. It is hoped that it can stimulate the development of more participatory approaches to city making in the future; and with that feed the debate of how these design approaches can enable systemic change.

Crafting futures in a Lebanese refugee camp: the Burj el Barajneh Souk.
Nihal Halimeh, Mahmoud Halimeh and Helen Avery

Friday 12:00. Room A1.

livelihoods

participatory networks

community empowerment

The idea behind this project began through an ethnographic study of the Bourj el Barajneh Palestinian Camp's population. Through the research and the understanding of the camp on all levels the project aims to use architectural methods to address the political and social relationships within the enclosed city and its surrounding neighbourhoods.

The sustainable and ephemeral Souk will empower an existing network of talent and craftsmanship; creating a metaphorical bridge that both connects and brings together segregated divisions on the political, social and urban level. The camp will be rejuvenated from within, as the Souk will assist in elevating the current population.

This project begins on a micro scale by working with what is already present and building upon it, creating a sustainable living structure. An architectural configuration will regenerate what is stagnant and fixed, strengthen the existing craftsmen, and improve on the new ephemeral and temporary formation.

The chosen space for the project within the camp is an already living and breathing organism. It is a social space, a market place and an area where the craftsmen have settled. After developing a master plan through different architectural strategies; concealing, constructing, regenerating and extending methods, this particular area stood out, as it's already a platform with social, educational and industrial integrated programmes.

The current Souk will be renovated into a space that connects to the present research circles in Lebanon for creative design projects, this will mobilize and utilize the camp's local talent while developing and expanding on the current knowledge and concepts needed to support a sustainable economy. As the Souk moves into the macro scale of the project it will tie into business support projects; which include shared distribution services, shared administration platforms for cooperatives with micro-banking and micro-insurance programmes.

o Maroun el-Daccache, Beirut: Architecture of conflicts, in Diagloghi tra Discipline, pp. 55-67. Ed. Statiozione Rogers.
o Students' Final Year Projects. FYP 2014, American University. School of Architecture and Design, Department of Architecture and Interior Design. Architecture Programme.

Environment and Sustainability

Unlocking Barriers to Sustainable Food Procurement in Finland: a Case Study.
Helén Marton, Andrea Cuesta

systems thinking

design thinking

design for government

food

circular economy

The case "A Model for Regional Sustainable Circular Food" has been commissioned to the 2017 Design for Government (DfG) course at Aalto University by the Finnish Ministry of Agriculture and Forestry (MMM) and the Ministry of Environment (YM), alongside Sitra and Motiva.

It explores and addresses issues around creating a regional circular food system in Finland and making profitability and sustainability match in this context. This submission falls under two themes of the RSD6 conference: democratic participation and policy innovation and human-scaled and regional economies.

The case is currently in its final ideation and proposal stages, and will be concluded on May 23rd 2017, so the final outcomes are still inconclusive. However, the value of this case already shows in methodologies used and artifacts produced, final results notwithstanding. Our team went through focused, iterative phases of Desktop Research, Empathic Design, Systems Thinking and Behavioral Insights. Throughout the case, methods of both Design and Systems Thinking were applied, and worked with in tandem to explore issues of a sustainable food system.

The case presents an example of the Finnish government's eagerness to embrace design and system methodologies through commissioning this brief and working together with students throughout the course. A commitment to experimentation and innovation is on the highest political agenda in Finland, namely the Governmental Program; and such efforts are evident with increasing interest in the course from various Ministries. Thus, this case is related to the theme of democratic participation and policy innovation. Additionally, the case is also related to the theme of human-scaled and regional economies, as it concerns itself with the regional sustainable food system. Our project grappled with concepts around the culture of centralization, price wars, power relations and viability of small, local farmers when competing

in this environment. We also explored the role of public procurement, and how the centralized practices affect and systematically disadvantage small, local farmers in the process and have no effective way to factor environmental impacts into the public procurement decisions.

"A Model for Regional Sustainable Circular Food" project is a 14 week long process where students are required to discover wicked challenges and propose interventions into the system using various Design and Systems Thinking methodologies as well as extensive desktop research into best practices and other relevant literature.

Throughout the process a rich selection of methodologies were used. In the Empathic Design phase we used interviewing, "sketchnoting" approach, design games like the ATLAS game and stakeholder mapping game. For Systems Thinking, we created system models, rich pictures from the soft system methodology and created participatory systems modeling exercises. For synthesising the information, we used affinity mapping. As for the ideation phase, we used the EAST card deck from the Behavioral Insights Team (UK) besides more traditional brainstorming techniques. Then, the ideation matrix method was used to evaluate our ideas.

During the empathic and systems stage, we especially appreciated using games, design games to be specific; as they were a fruitful and participatory way to engage stakeholders. According to design game scholars and practitioners, Tuuli Mattelmäki and Kirsikka Vaajakallio, these games introduce a structure and elicit a playful mindset that can result in a rich output as participants suspend disbelief and immerse themselves in play. The stakeholder mapping game resulted in rich discussion and a visual interpretation of actors, connections and flows in the Finnish food system. The participatory systems modeling was useful in uncovering the complex world of public procurement from the perspective of public procurers themselves.

The case offers knowledge around design and systems thinking methodologies used to create interventions on wicked challenges, in a governmental context. It presents the challenges of combining these methods, as well as the perceived benefits. It also presents the final intervention proposed to the commissioners of the brief and the ministry response to the ideas presented.

Design as Civics: A citizens' practical philosophy for making wise decisions that 'aim' for the 'good life' in our unsustainable era.
Paul Emmerson and Robert Young

Thursday 11:30. Room A4.

Design as Civics

Sustainability

Civics

Practical Philosophy

Sustainability as Fairness

Fairness between Citizens

Values

Reflexivity

Today's and future generations suffer a lack of fairness resulting from the unsustainable systemic environmental effects of capitalism's western consumer lifestyles. A 'wicked problem' that we posit, in part, design 'supports,' because design is an amoral practice and lacks a systemic perspective. Capitalism's 'free market' metaphor wants and desires – its power – dominates design practice and pedagogical theory.

Our response challenges capitalism's power. Our theory integrates systems thinking and design as the basis of a social practice of citizens'. Whereby citizen's, applying their values as agonistic political conjectures, confront 'free market' ideology. We contend sustainability is represented as the systemic relationship frame term 'sustainability as fairness' (SaF), whereby fairness equals 'fairness between citizens' (FBC).

Our thesis foundation synthesises the Ancient Greek practice of civics with design. It forms the practical philosophy we term design-as-civics (DaC). DaC is a reflexive, systemic radical political praxis for citizens. It intrinsically possesses the explicit value-rational teleological moral goal of delivering the 'good life' for all through its 'aim' for 'fairness between citizens.' We report our findings here briefly from two projects upon which the full paper will expand.

'The Design Ecosystem' – A systemic view towards design and society, in the Indian context.
Maulshree

Thursday 12:00. Room A4.

systems thinking

design ecosystem

systems theory

systemic foresight

108

Design, at the simplistic level, is a human endeavour to make our environments more congenial; the denominators of which are arbitrary and change from context to context. We have reached a point in time where design cannot be an activity in isolation synonymous with mere creativity or innovation. With the need for design to be able to provide a holistic solution, it necessitates a look at the entire system.

It has been noted by a number of designers, design thinkers and system thinkers that a change in paradigm is underway in our society which not only concerns with the World of Design but the environments' we live in. It is therefore perhaps pertinent to take a re-look at not only our understanding of 'design' but also how the same can be differently employed for alternate design solutions. Towards this end, the concept of Design Ecosystem is proposed. Though still in the conceptual stage and further directed to an evolving stage, the concept, provides an alternate perspective and, hopefully, an approach in consonance with the needs of the day. For the most part, in India we continue to follow the understanding of design as in the West, where it originated as an industrialisation by-product. The need of the day though, seems to be adopting a much wider definition of design that would incorporate the practices that have developed sans industrialisation too.

The term 'system' implies an orderly arrangement, an interrelationship of parts. The approach views Design and the Society through the lens of systems theory that enables us to see the structure and the behaviour of the system, and makes an attempt to understand the relationship between the two. Thus, the design community is related to an 'ecosystem'. To draw a parallel with a system of both biotic and abiotic components, the design community is made up of the players that actively affect the system and of other variables that can be said to be part of the 'exo-system' that affects it. The proposed term 'Design Ecosystem' views the encompassing environment and the society as a whole, besides the components that 'design' seeks to directly address , each of which is in fact affected by 'design' at every possible sub-system level. The overlapping, nested, and networked subsystems operating within broader systems need to be identified; their elements, their interconnections and function/purpose of each sub-system, which is the most crucial determinant of systems behaviour, requires determination further.

The objective of interpolating the concept of ecosystem in an exhaustive understanding of design is to capacitate individuals and organisations in providing holistic long-term solutions even for situations that might possibly arise in the future; this is achieved because the solution proposed encompasses all the components of the system – the ecosystem in entirety. While this approach might already be adopted in the West, at least in parts, the need for the same appears severely wanting in the Indian context where it is perhaps even more pertinent and imperative, and, yes, equally challenging.

This 'eco-system', in the Indian context, should take into account the ethnic variations, the socio-cultural factors, the geographical factors, the political and economic factors, and the roles these play in producing patterns of behaviour over time. Identifying these patterns is key to understanding the system, and thus the emergent properties of the system, the leverage points that can initiate desired change, and determining the potential for threshold behaviour and qualitative shifts in system dynamics. A framework that focuses on knowledge and understanding of system dynamics is therefore proposed for the ecosystem – an 'open' and complex system forever in a state of 'flux'. The research and analysis needs to unify information from both specific social values as well as wider objective forces. This requires thinking that is capable of grasping the big picture, including the interrelationships among the full range of causal factors underlying them.

Architecture and Urban Ecologies

Towards Embedded Architectures:
Informed Non-standard and Information-based Design.
Søren Sørensen

This talk pursues the notion of informed non-standard architecture, which arises in the intersection between performance-oriented and non-standard architecture.

In the context of the built environment hard systems approaches and performance approaches has gone hand in hand since the 1960s. However, the introduction of a mixed systems approach in conjunction with design-thinking and research by design significantly changed the take on this and introduced a wider scope of understanding as to what performance and agency in architecture might entail. This entails three conceptual and operational aspects: [i] design and production of architectures, the design of which is informed by specific performance criteria, [ii] the notion of location and condition-range-specific design systems that take a middle position between universally applied designs and entirely bespoke architectures, and [iii] the development of a related design method entitled information-based design.

The 1990s witnessed increased experimentation with and intensification of computational design in architecture. This went hand in hand with the development of means of industrial production, especially computer-aided fabrication that began to be employed in architecture to facilitate the design and construction of complex geometries engendered by computer-aided design. At around the same time computer-aided design and computer-aided analysis were coupled in the attempt to capture, develop and utilize performative capacities, culminating in a series of publications on performance-oriented architecture and significant changes in architectural design and production.

This talk will show systemic research by design activities that focus on two types of design systems, one lightweight and adaptable to local conditions, and another that is massive that co-adapts with landscapes. This research is undertaken at the Research Center for Architecture and Tectonics and the Advanced Computational Design Laboratory at the Oslo School of Architecture.

Encoded ecologies of the Venetian lagoon: A multi-scalar data-driven computational approach for dynamic environments.
Matteo Lomaglio

designing dynamic environments

multi-scalar interdisciplinary approach

advanced computational methodologies

The paper and presentation will focus on a project that combines ecological and architectural scales and addresses the design and transformation of the environment of the Venetian Lagoon through advanced technologies. The project draws from a combined systemic and design approach and proposes a dynamic and varied attitude to landscape preservation and transformation. In so doing the project focuses on a multi-scalar approach to the ecosystem in which Venice is located. A multi-criteria analysis was undertaken based on available ecological, geological and hydrological information of the lagoon. The understanding of the complexity of this ecosystem made it necessary to investigate both current and innovative technological developments reflecting a diverse approach to ecological restoration of dynamic environments. This includes selective preservation and selective transformation in a dynamic an ongoing project for the lagoon, a proposed new botanical garden as a terrain vague, and the architectures and technologies that are key provisions in this complex process.

For this reason it is of fundamental importance to define a complex network of relationships between the different pieces of information collected, in order to encode them together into an integrated set of generative algorithms. The aim of the thesis is the definition of complex systems of data-driven architectural strategies through computational tools. The focus is not only on the architectural scale, but the research and strategies involve the multiple scales of the lagoon, considering the concept of "scale" as determined by two main components, both the resolution (as far as spatial data is concerned) and time. The project aims to utilize the use of advanced computational methodologies in close relationship to geo-spatial information to inform architectural strategies at different scales. It also attempts to initiate a new approach for collaboration between disciplines such diverse and interrelated as geography, ecology, urban planning, computer science, Statistics and Architecture.

A Systems Framework for Designing of Urban Commons and Sharing Practice: Three Case Studies in Singapore.
Jeffrey Chan and Ye Zhang

Sharing

Urban commons

Ethics

Design

Systems Approach

Singapore

"Inventive architectural solutions can contribute invaluably to the dynamics of common space creation. But architecture alone cannot guarantee that designed spaces will become commoned spaces, spaces of commoning and spaces-as-commons." [italics ours] (Stavrides, 2016).

Inexorably in a milieu characterized by the relentless privatizations and enclosures of neoliberal urbanism (Harvey, 2012), the counterpoise of the urban commons has found a steady traction simultaneously in different disciplines today. From critical urban studies (Harvey, 2012; Kip, Bieniok, Dellenbaugh, Muller & Schwegmann, 2015); sociology (Kornberger & Borch, 2015); urban design (Ferguson, 2014); planning (McLaren & Agyeman, 2015); architecture and urbanism (Stavrides, 2016), the study of commoning and the commons has increasingly taken an urban turn. Not only does the urban commons conceptually promise a new field of thought beyond the canonical dichotomy of public versus the private (Schwarz, 2016: 84), but it has also been suggested as a kind of commons that can increase in value while it is being consumed (Kornberger & Borch, 2015).

In turn, these promises have prompted different attempts to design the urban commons, and how various sharing institutions can come to facilitate it (see Ferguson, 2014). Even so, there is still little systemic knowledge on how to either design for shareability (Schwarz, 2016: 87), or the urban commons (Stavrides, 2014). Unlike the commons of common-pool resources (CPRs) pertaining to how bounded communities collectively and sustainably manage woodlands, meadows, or fisheries (Ostrom, 2006), the commons in any city is situated in a system characterized by openness, value pluralism, and conflict. And unlike the goals of many commons in history—where the commons was established to maximize survivability and inclusivity of the least advantaged member of any community (see Linebaugh, 2008)—the goals of urban commons today are admittedly more plural, fluid and contentious (Stavrides, 2016).

Here, we suggest that the design of the urban commons will benefit from a framework predicated on the systems approach. Relying on the systems approach (see Churchman, 1968; Churchman, 1979), this framework asks the following guiding questions for design:

(i) What is the goal of either the urban commons, or the sharing system?
(ii) Specifically, whose goals are these? How is attaining these goals consonant, or contradictory, to the goals of a larger system (e.g., the flourishing of humanity)?
(iii) To what extent is this goal (or goals) appropriate, proper or justifiable? In other words, what is the ethics of this system?
(iv) Who, or what, is the 'enemy' of the system to be designed (i.e., what are the variables that can oppose these goals or counteract the attainment and maintenance of these goals)?

And because every design presumes a certain choice for a certain kind of urban commons, there is therefore also a need to ask this question:

(v) Which commons is being championed at the expense of what other commons? What is the ethics behind choosing one commons over another commons?

In this paper, we propose to analyse three case studies from a design studio conducted on the theme of urban commons and sharing. Each of these case studies presents a different system of sharing and posits different goals that then entail a different set of ethical issues and possibly, resolutions. Here, we briefly introduce the design studio and three case studies and then in a table summarise—tentatively— what some of the abovementioned guiding questions of systems approach may prompt for each case study.

The studio explored what kind of urban commons and sharing system can be designed for regenerating a multicultural historical neighbourhood in Singapore. And design investigation was stratified to tackle the different dimensions of the neighbourhood respectively including urban infrastructure, public amenities, economic production, cultural consumption, etc. The three case studies analysed in this paper are therefore hypothetical proposals each addressing one single dimension of the neighbourhood.

Case study A introduced a system of self-driving cars and energy generators. The former primarily serves as local taxis that facilitate residents moving around in the neighbourhood and in particular connecting to public transport nodes, while the latter produce electricity from the waste of the entire neighbourhood to power the self-driving cars. Residents can use the self-driving car service for free based on the amount of credit earned through contributing waste to the system.

Case study B proposed to deinstitutionalise existing schools and complement them with an open education system using the redundant and/or temporarily underutilised spaces within the neighbourhood. In this system, both residents and visitors with certain expertise and certifications can offer open lessons for a mix of different 'students', who are expected to benefit from a diversity of exposures without paying extra school fees.

The final case study proposed a physical–virtual marketplace for work within the neighbourhood. In this system, a number of digital screens are introduced to the neighbourhood centre as interactive public installations, where different QR codes that link to different work in constant change are displayed, and those who are interested and/or would like to earn extra income can scan the codes to apply for these jobs. The QR codes are deliberately kept offline and only displayed altogether in one place in order to bring residents or visitors to the neighbourhood centre.

Case studies System of sharing Goal(s) of the system Counteraction to the attainment of goal(s)

A Self-driving cars /
Energy
Enhanced mobility/
Energy efficiency
Frugality / Parsimoniousness

B
Teaching / Learning

Knowledge proliferation / Community engagement

Privatisation /
Profit-seeking

C
Labour / Work

Full employment /
Optimal productivity

Leisure /
Inertia

(874 words)

Bibliography

Churchman, C.W. (1968). The Systems Approach. New York, NY: Delta Books.

Churchman, C.W. (1979). The Systems Approach and its Enemies. New York, NY: Basic Books.

Ferguson, F. (ed.) (2014). Make_Shift City: Renegotiating the Urban Commons. Berlin, Germany: Jovis.

Harvey, D. (2012). Rebel Cities: From the Right to the City to the Urban Revolution. London, UK: Verso.

Kip, M., Bieniok, M., Dellenbaugh, M., Muller, A.K. & Schwegmann, M. (2015). Seizing the (Every)day: Welcome to the Urban Commons! In M. Dellenbaugh, M. Kip, M. Bieniok, A.K. Muller & M. Schwegmann (eds.), Urban Commons: Moving Beyond State and Market. Basel, Switzerland: Birkhauser, pp. 9-25.

Kornberger, M. & Borch, C. (2015). Introduction: Urban Commons. In C. Borch & M. Kornberger (eds.), Urban Commons: Rethinking the City. New York, NY: Routledge, pp. 1-21.

Linebaugh, P. (2008). The Magna Carta Manifesto: Liberties and Commons for All. Berkeley, CA: University of California Press.

McLaren, D. & Agyeman, J. (2015). Sharing Cities. Cambridge, MA: MIT Press.

Ostrom, E. (2006). Governing the Commons: The Evolution of Institutions for Collective Action. New York, NY: Cambridge University Press.

Schwarz, M. (2016). A Sustainist Lexicon: Seven Entries to Recast the Future—Rethinking Design and Heritage. Amsterdam, The Netherlands: Architectura & Natura Press.

Stavrides, S. (2014). On Urban Commoning: The City Shapes Institutions of Sharing. In F. Ferguson (ed.), Make_Shift City: Renegotiating the Urban Commons. Berlin, Germany: Jovis, pp. 83-85.

Stavrides, S. (2016). Common Space: The City as Commons. London, UK: Zed Books.

Architecture as Systems Design & Innovation Design Discipline.
Christos Chantzaras

Thursday 17:00. Room A1.

Talking about architecture can be in broad terms divided in talking about buildings and talking about processes. Focusing on the latter, architecture is a way of thinking and looking at things, people, spaces and interactions, which is close to systems design. In 2015, Tim Brown, the CEO of IDEO, stated that "architectural education is the best systems design education in the world." In regard of Russel Ackoff, who graduated first in architecture before turning to operation research, the question arises, what exactly are these skills, that architecture and architectural education have in common with systems design, and what distinguishes them.

The paper proposal and talk is a first approach to clarify similarities and differences by reviewing the architectural programming method. The method is seen as medium through which the skills of architects as designer of systems are becoming visible, recognizable and

comparable. The talk during the RSD 6 Symposium will give a brief look back on the history, principles and application of architectural programming and outline its relevance for defining a new approach of architectural design thinking. As management tools and methods, coming from decisions attitude, a are reaching limits in dealing with rising complexity, uncertainty and alternative thinking, architectural programming can provide a bridge towards the design attitude in developing new systems of organizations and innovation processes bringing the skills of architects (as abstracting complex socio-technical systems, understanding context and interrelations, applying non-linear thinking for handling wicked-problems and the ability for synthesis) into the decision zone of management tasks.

Regarded as „research and decision-making process that defines the problem to be solved by design" architectural programming integrates elements of scientific research, project management and architectural thinking. Considering its basic principle to separate solution from problem and extensively examine context, content and complexity of a (building) project, it can be viewed as predecessor to the nowadays commonly applied Design Thinking method.

Selected projects from practice will be presented, along with student's works and workshops, resulting from a newly created initiative on Architectural Entrepreneurship at the TUM Department of Architecture. The question of how to raise awareness for architecture as "Systems Design & Innovation Design Discipline" will opened for discussion during the RSD 6 symposium, as well as, what further steps may be appropriate for an integration into architectural education.

Systemic Design Pedagogy and Education

Teaching Design for Democracy.
Birger Sevaldson and Linda Blaasvær

Design for Democracy

Systems Oriented Design

Education

This proposal reports on a new studio course at the Oslo School of Architecture and Design (AHO), started in autumn semester in 2016. The course will be repeated in autumn 2017 and in the coming years. The aim is to slowly develop pedagogic approaches and a curriculum for teaching Design for Democracy.

The proposal will present the course briefly and we wish to spend time on discussions and input to how to develop it further. It is important for us to present this work in progress, share our experiences and to have ideas and input as well as criticism so that we can develop it better in the coming runs. At the time of presentation, we will be in the middle of the second run of the course and we will be able to present our resent experiences. The course is a master level studio. Its length corresponds with 24 ETCS duration is one semester.

The course is suitable for all sub-domains in design like service and product design, interaction design, design management and other new fields of design like organization, strategy, policy etc. It is also relevant for architecture, urbanism and landscape architecture. The course ranges from micro to macro scale and students can develop and choose their perspective.
Systems Oriented Design (SOD) is the integrated bases of this course.

We are experiencing major unrest in the world; democratic values are at stake, people fleeing from their homes and from war. Many nations are heading towards democracy but it is a cumbersome way forward. The party systems is under stress. Even established democracies are struggling. Norway is not an exception when it comes to the need for better participation and accountability of voters and citizens in general. The representative democratic systems' inherent reinforcement of short-term perspectives together with the complexity of the driving processes makes it very difficult for citizens to voice long-term considerations and to know how to claim participation. Local dialogic democracy is underdeveloped compared to the major tasks that communities are confronted with. These range from sustainability to economic development and integration.

Work place democracy is under pressure. The neo-liberalist wave of the late last century, new economies and cultural changes have weakened the labor unions, their influence and their power.

Inequality is rising globally while the sense of fairness is crumbling. These are corner stones of functioning democratic societies.

On the other hand, design has a long tradition of developing processes from a democratic perspective. Universal Design and Participatory Design processes are examples of this. In addition, designer have been involved in democracy in designing voting processes and information distribution for a long time.

However, design for democracy can be developed further. Can we, through design, envision and describe a future that supports a balanced distribution of power, values, and resources? Can we contribute to building democratic cultures and lowering the threshold for participation in democratic processes? Can we design processes that make it easier to think long term and through this encourage sustainable development? Can we, through the design of our surroundings help the emergence of democratic organizations?

The theme Design for Democracy seeks innovation to support democratic processes in small and large scale. Democracy is under pressure and there is no guarantee that democracy will prevail without a comprehensive effort to protect and develop democratic processes. This effort for developing democracy may in many ways, be perceived as a design process, and designers have a lot to contribute.

In our age where the Internet has made it possible to reach out with ones opinions and where Democracy 2.0 has been relevant for a while, it is important with an effort to find out how designers can help.

The theme may involve a number of areas and issues where design can be a crucial factor:

– How to convey democratic history? –
– How to help people to vote for their long-term interests?
– How to make discussions of sustainability more accessible?
– How to vote on behalf of others, your children, grandchildren, future generations or others who cannot vote? (Agency)
– How Designing voting process as an interactive service?
– How Reveal / uncover and communicate processes that undermine democracy?
– How to fight for democracy? (Activism) What is the role of digital media in the ongoing popular uprisings?
– How to build democratic cultures?
– How to design our environment, cities, architecture and nature in democratic processes and democratic expression?
– How designing new democratic arenas?
– Networks, Technology and mobile phones as the venue for Democracy 2.0.
– Design for variety, tolerance and integration.
– Crowd Sourcing. (Self-organizing systems)

– How can design fight oversimplified solutions and populism?
– How can design make economic processes transparent?

System Thinking is a foundation to develop a deeper understanding of sustainability, ethics, culture and society, and to develop the understanding of communication, technology and innovation. Students will gain a general understanding of systems thinking and especially on SOD. They will develop skills in adaptive expertise, Very Rapid Learning, collaborative processes and participatory design.

The course is principally political neutral. However, understanding society including power structures are necessary in this study.
Ethical considerations are important and we think that social systems should not oppress and marginalize any participant or citizen nor do harm to non-humans.
We do not think that design can fix problems easily. We do not think every change does need long-term commitment but we think change is a continuous process. It is a misunderstanding to focus on processes of change like if they would be different and separate of an imagined normal state of no change. We do not believe in the traditional designer role, providing plans for people for them to implement. The best we can do is to use our designerly creativity to suggest actions that might trigger new directions in the flux of society. We therefor think of this project in the framework of versioning and iterations. The design activity is an integrated part of this ongoing flux.

In line with this position, the suggested design interventions need to take these issues in account and demonstrate how they might evolve into new versions, how they will work and might develop independently after the designers have left the field.

The School of System Change: Designing a learning system as a system change endeavor
Corina Angheloiu, Laura Winn and Anna Birney

Thursday 16:00. Room A2.

System change

Education

Learning systems

Community of practice

Design thinking

Context

The Western education system has long been diagnosed as not fit for purpose for a post-Industrial Revolution world. Since the 1980s, attention has turned to the evolution of design education as exemplary of thinking and learning processes which enable future practitioners to deal with complex problems and uncertainty (Lawson, 1980). This has led to the development of design thinking as a field and the advent of 'designerly ways of knowing' (Cross 1982). Cognitive psychologists have argued that these represent the interplay between binary processes of convergent thinking (which asks 'what comes next in this logical sequence?') and divergent thinking (which asks 'what might this mean?'); of rational, deductive thinking and intuitive, open-ended processes of thinking (Lawson 1980).

On the other hand, sustainability educators have called for 'the necessary transformation of higher education towards the integrative and more whole state implied by a systemic view of sustainability in education and society' (Sterling, 2004). New approaches to problem solving and problem setting are required to enable fundamental change at every level of society if we are to tackle interconnected "wicked-problems" such as climate change, biodiversity loss and inequality (Worldwatch Institute 2013, Capra and Luisi 2014).

Over the last decade, calls for 'earth-literate leaders' (Martin and Jucker 2005) have intensified given the recognition of the complexity and interconnectedness of sustainability issues which span beyond the triple-bottom line of social, environmental and financial systems and are closely intertwined with issues of governance, decision-making (Adams et. al 2017) and ultimately, with seeing sustainability as the 'ability to sustain ourselves' (Birney, 2015).

But how to achieve such a transformation?

Across formal education disciplines the teacher-centred pedagogy is still the dominant paradigm. Students and teachers still follow the learning patterns of the apprentice – master power dynamic (Souleles 2017). This is in antithesis to notions of empathy, the ability to develop deep human-centred understanding, to adopt different viewpoints and to develop a mutual understanding. However, these capabilities are key to equipping future generations of 'earth-literate' practitioners and leaders.

New challenges, new ways of learning: The School of System Change

Forum for the Future, an international non-profit working with business, government and civil society to solve complex sustainability issues, has been a pioneer in this field by setting up the first ever Masters for Sustainable Leadership in partnership with Middlesex University. By 2015, after 20 years of running the Masters course, over 150 students went on to become successful sustainability leaders. Recognising the challenges pointed out above, we set off to redesign the Masters programme, guided by the following inquiry questions:

How might we equip people with the capabilities to lead system change initiatives addressing complex sustainability issues?

How might we grow a global community of practice connecting existing networks of 'change agents' who want to shift whole systems?

How might we intently design a learning system which doesn't reinforce the prevalent master –

apprentice dynamic?

Our long term vision is to create a global community of practice (Wenger, 2010) for people who are catalysing the system-level change we need to achieve a sustainable future.

The School of System Change will:

equip people with the capabilities to lead system change initiatives addressing complex sustainability challenges

offer flexible access to the best learning experiences, tools, and case studies from the field of system change

grow a global community of practice by connecting existing networks of 'change agents' who want to shift whole systems.

We are calling the people who benefit from the School and who join our community, 'change agents', as they will be working to create change the world over. The ultimate outcome of the School will be the impact of the work that these change agents go on to do – finding ways forward on a range of global problems across the economy, the environment and society.

Prototyping a learning system: Basecamp#1

We are taking a system change approach to our own endeavour, through building an emergent strategy towards our vision as we go along; trying out different approaches that deliver change in their own right, but enable us to understand the ecosystems and markets (geographies and communities) we are entering into; and growing the necessary "connective tissue" to run the School effectively and build relationships to create development capital, market reach, delivery capacity and a sustainable viable operational and financial model over the long-term. Basecamp#1 is a successful pilot learning experience, and also a "test bed" for the community of practice we want to build, bringing together participants and contributors from different parts of the world and enabling them to learn together and support their work facilitating systemic change for sustainability on an ongoing basis.

Early findings from running the pilot have shown us that, to deliver the wider impact we are aiming for, participants (and contributors) need support to continue to develop their skills, experience and network.

Indicative bibliography:

Birney, A. (2014). Cultivating System Change: A Practitioner's Companion (1 edition). DoSustainability.

Cross, N. (1982). Designerly ways of knowing. Design Studies, 3(4), 221–227.

Lawson, B. (2005). How Designers Think (4 edition). Amsterdam: Routledge.

Martin, S., & Jucker, R. (2005). Educating Earth-literate Leaders. Journal of Geography in Higher Education, 29(1), 19–29.

Sterling, S. (2004) 'Higher education, sustainability and the role of systemic learning', in Corcoran, P.B. and Wals, A. E. J. (eds) Higher Education and the Challenge of Sustainability: Problematics, Promise, and Practice, Kluwer Academic Publishers, Dordrecht, 47-70.

Sterling, S. (2001) Sustainable Education—Re-Visioning Learning and Change (Dartington: Green Books).

Souleles, N. (2017). SOCIAL CHALLENGES VERSUS TEACHER-CENTRED PEDAGOGIES. Retrieved from https://www.academia.edu/32422621/SOCIAL_CHALLENGES_VERSUS_TEACHER-CENTRED_PEDAGOGIES
Wenger, E. (2010). Communities of Practice and Social Learning Systems: the Career of a Concept. In C. Blackmore (Ed.), Social Learning Systems and Communities of Practice (pp. 179–198). London: Springer London.

Using Giga Mapping in Systems-Oriented Design Education.
Eunki Chung

Giga-mapping

Systems-Oriented Design

Conceptual Models

Things

Design Education

Through series of Giga mapping (Sevalsdon, B. 2011) posters produced at a graduate level design seminar course at SCAD (Savannah College of Art and Design), I aim to discuss the application of Giga mapping approach in teaching systems thinking to design students.

The assignment was a three-week project asking students create i) 1,000 words non-fictional essay of a thing's narrative as non-human actants (Latour, B, 1992) (Tonkinwise, C, 2006) and ii) a Giga map illustrating the thing's interrelationships in the developed narrative. Giga mapping paper and online resources at Systems Oriented Design (http://www.systemsorienteddesign.net/) were introduced to students prior to the assignment. All students were pursuing M.A. or M.F.A. in Industrial Design or Design Management, and have at least 2 years of professional design or design-related practice.

In the poster session, I plan to give details of the assignment, showcase selected students' works (attached), share student's reactions to the assignments, and facilitate a conversation to advance systems-oriented design education. Based on the poster session outcome in RSD6, I wish to develop a collaborative research/paper with AHO and other Giga mapping using institutions and researchers.

Systemic Design Master Development.
Patrice Ceccarini

Our presentation gives an overview of the design methods in architectural systemic design (or systemic design in general) developed by a team of researchers-teachers of the Ecole Nationale Supérieure d'Architecture de Paris Val de Seine. We will briefly expose some key notions for giving an understanding to the specificity of our approach such as the concept of "architectural affordance », as well as another important concept of our design methodology that we call architectural profiling.

Finally, to illustrate our design processes, we will show some samples of interesting cases developed by students in their Master's diploma studies.

Teaching Team Work in Systems Oriented Design.
Andreas Wettre and Birger Sevaldson

Systems Oriented Design

Therapy

Team work

Systems oriented design (SOD) is rooted in systems thinking. SOD is considered one approach of Systemic Design. Systems thinking is also representing a way of approaching therapy as one of its specific applications. Many of the approaches in management have emerged from the knowledge developed in and around therapy. The way to look at an individual or a group of people as a system is one of them. Systems thinking helps where a traditional root-cause analysis fail to give us the necessary understanding.

In a 7 weeks bachelor studio course at the Oslo School of Architecture and Design Systems Oriented Design was the main approach and topic. The students were working in teams with a complex task with a company as partner. The company is developing and marketing solutions for charging of electrical vehicles. The brief given from the company was to develop new charging solutions. Such design teams are systems in their own right. This is realized both by second order cybernetics and by for example the three dimensional model of Lurås (Lurås, 2016). In our work with the educational program at AHO we wanted to create a higher understanding by combining SOD and systems thinking applied to team and individuals. The teams were constructed to ensure that all teams had individuals representing product-, interaction- and service design.

As the students developed their understanding and ability to map the systems around charging electrical cars we wanted them to use the same kind of thinking to understanding the team dynamics and how each individual is affected by the team, and how the individual behavior affected the team's ability to move towards the goal of utilizing the diversity. The CMM theory (Barnett Pearce og Vernon Cronen 1980) describes how any communication is happening in a system of contexts, and in a team we create a common social world when communicating. The co-creation of a common understanding of the contexts is essential to grasp the complexity and create breakthrough design.

We started out by letting the team define their purpose. Creating a common and deep understanding of the team's purpose is proven by Bang & Midelfart (2012) to be essential to a management team's performance. We have lots of experience, from business consultancy, using SOD's GIGAmapping to create a common understanding in the team of the complexity within it is to fulfill its purpose. A team of designers that is set to create a design utilizing the diversity in the team faces most of the challenges a management team will face. Such as agreeing on the teams purpose, communicating within the same context, knowing when a topic is raised how they as a team and individuals can add value, stopping each other when distracting the discussion, being curious at the others and not fighting for one own view etc.

Gigamapping works well allowing the team not to follow a structured approach, but rather an unstructured discussion going from one context to the next and back again. This unstructured discussion helps everybody grasping the holistic perspective of the complexity. The unstructured discussion is also crucial when design teams or other management teams work with complex (wicked) problems. Typical for such work is that predefined briefs are unsuitable to use. The projects tend to have an open-ended nature where issues are explored during the projects and learning is integrated in the process.

To deepen the understanding of the purpose the team members where challenged to understand how we can look at one person as a system, linked to his/her surroundings where changes in the internal system (behavior) will affect changes in the external system (team?) and vice a versa. We used "Social constructionism" and Kenneth Gergen´s perspective on reality being constructed in relations and nothing is considered real before we agree that it is (Kenneth Gergen "Realities and Relationships" 1997).

As a tool to improve communication around reality, common purpose and how to use task conflicts to create better solutions, we examined Chris Argyris´ Ladder of Inference (The Ladder of Inference was first put forward by organizational psychologist Chris Argyris and used by Peter Senge in The Fifth Discipline: The Art and Practice of the Learning Organization.) This concept helps us understand how our assumptions are formed and that being part of a system will influence how we filter information and form assumptions and being curious on other´s assumptions will open for new insight.

There are many similarities in using mapping techniques to understand systems in SOD and understanding our own and our fellow team member´s assumptions and behaviors. Developing skills in using the right questions at the right time is essential in both cases. To dig more into this, we trained on dialogue using the four main elements of a) believing that you can learn from your fellow team members b) respect even when disagreeing c) exploring different views and d) build on each other. The basic idea is to use task conflict in a constructive way; exploring different views will generate better solutions. To create the right atmosphere we were using Karl Tomm´s categorization of questions, starting with the fact oriented questions before moving into relational questions, to hypothetical questions before ending up with the more strategic, leading questions (Interventive Interviewing: Part 111. Intending to Ask Lineal, Circular, Strategic, or Reflexive Questions?*
KARL TOMM, M.D.t 1988).

To understand group dynamics and organizational behavior even better, we used Stacey´s theories about the complexity of organization and how the old dominant logic fail in trying to plan up front and not considering the relational knowledge that will emerge (Solsø & Thorup, Ledelse i kompleksitet 2015). We wanted the students to use the learning from the emerging design project and adapt that also to the emerging competence and diversity in the team – to help the team make the right decisions and develop innovative design.

The sub-goal of the project is to make designers understand that the team is a system itself and understanding the individuals and team dynamics will help creating new design, where harmony is not necessarily an aim, and where conflict might be productive. A high performing team has the ability of using task conflicts to create better design without creating relational conflicts. We wanted them to use many of the same methods as they use in design and apply them to team development. We hoped that their ability to understand team dynamics and their own role in the team as a system would increase by using many of the same methods they use in understanding the different possible solutions in design.

We believe that the teamwork perspectives presented here also are relevant for building functioning democratic cultures on a larger scale.

In the presentation, we will discuss the reported experiences from the students.

Open-ended Design as Second-order Design. A case study of teaching Cybernetics and System Thinking to Industrial Design students.
Francesca Ostuzzi, Walter Dejonghe and Jan Detand

Open-ended Design

Cybernetics

Second-order Design

Industrial Design

Education

Design can be seen as the process of creation of what is not there, and what is ought to be [7]. One of the main problems of this complex process is the gap that is created between the design space and the real context of use [3]. To cover this gap, a constant conversation is needed, between all possible stakeholders of the design process itself. Thanks to this conversation, which can be seen as Second-order Cybernetics, the actors learn about what conserves and what changes in the designed solution thanks to the context/environment [2], which can also be defined as re-appropriation [8]. This conversation can occur only in time and in the real context of use. To facilitate the conditions for this conversation to happen, which is ultimately a design act done by others, a second-order design is advocated [2][4]. The definition by Dubberly et al. of second-order design as "[The signage system] is never completely finished, never completely specified, never completely imagined. It is forever open." closely resembles the definition of Open-ended Design as outcome of the design process that is "able to change, according to the changing context. Open-ended Design, can also be defined as suboptimal, error-friendly [6], unfinished, Wabi Sabi, contextual, context-dependent and is characterized by its inner flexibility due to the voluntary incomplete definition of its features, also defined as its Imperfection." [9].

In this paper, we describe a case study of teaching Cybernetics and System Thinking design to Industrial Design Engineering students. The course, given to 3rd year students, is project-based [5] and focuses on small communities. The goal of the course is to let the students interact with the community and, by the constant use of functional prototypes and observations of the occurring interactions, try to start a self-sustaining process. The described year edition is about compost, both aerobic and anaerobic. Specifically, we focus this paper on an experiment where the students' learning process was supported by the adoption of Open-ended Design Solutions.

The flow of the experiment is as follows.
• Every student received a case study where specific strategies for Open-ended Design are

adopted in commonly used industrial products.

• (Task 1) Every student had to conduct an analysis following the flow reported in Figure 1, which mainly consists of:

o Model of Alpha process, highlighting the spontaneous process occurring and the meaning feedbacks related to is.

o Model a possible "controlling solution", meaning a solution that ignores the identified spontaneous process. To do so, the use of archetypes was advised [1].

o Explicit the main hypothesis (HP) done by the designer and how this relates to the complex dynamic of change. Starting with the basic HP for which "of the product is used, then it changes".

o Answer and explain the ten lenses of OeD, here listed.

♣ Why is the product changing? (relation with the spontaneous process)

♣ Who is changing the product? (agents of the spontaneous process)

♣ Is the main actor making a change to reach a particular goal? (goal directedness)

♣ What is changing in the product? (phenomenology of the process)

♣ How much is the product changing? (phenomenology of the process)

♣ How fast is the product changing? (phenomenology of the process)

♣ Is the change reversible? (phenomenology of the process)

♣ When is the change happening? (relation with the Life Cycle of the product)

♣ Where is the change happening? (relation with the Business Model)

♣ How many products can be produced in this way? (relation with the Business Model)

o Describe and explain the lens "How", which is divided in mechanisms, that is how is the change physically supported (i.e. by using a modular solution, by using a fragile material, etc.) and strategies, that is how commercially is the change supported (i.e. by producing a big number of standard products in form of DIY kit, by using digital technologies in co-creation processes, etc.). Highlighting relations with both the engineering background of the students and their entrepreneurial skills.

o Model of Beta Process, highlighting if the newly designed system is working as anticipated (accordingly to the HP) or not.

• (Task 2) Every student has to design a double-blind test in order to learn more about the spontaneous interaction between the actors and the product, in the real context of use. To do so, the strategies studied and described in Task 1 should be applied, in order to increase the intensity of the traces (working as feedbacks) left by the interaction itself.

Figure 1: Open-ended Design, dynamic and learning process.

Students applied practical Open-ended Design solutions, or second-order design solutions, to start a conversation (through design) with different stakeholders. Here, the voluntary (designed) imperfection of the system served as trigger for re-appropriations, which helped the designers in learning about the real interactions with the system itself. This experiment stresses the need for teaching system thinking skills for designers, focusing on the fundamental capabilities as anticipating possible scenarios and losing control on the designed object. Also, it stresses the importance of practical examples and strategies to achieve and support re-appropriation

processes in real-life experiments. These strategies cannot be taught to students as "fixed realities" being highly related to the context, but can be introduced to them as inspirational and comparative tool. By doing that, the actual Open-ended Strategies developed by students became the expression of their creativity as designer, and served as tool to support intentional change.

Short reference list

1. William Braun. 2002. The System Archetypes. The Systems Modeling Workbook: 1–26. Retrieved from https://kumu.io/stw/systems-kele#systems-archetypes
2. Hugh Dubberly and Paul Pangaro. 2015. Cybernetics and Design: Conversations for Action. Cybernetics and Human Knowing 22, 3: 73–82.
3. Guido Hermans. 2015. Opening Up Design: Engaging the Layperson in the Design of Everyday Products. Umea University.
4. Klaus Krippendorff. 2007. The Cybernetics of Design and the Design of Cybernetics. Kybernetes 36, 9/10: 1381–1392. https://doi.org/10.1108/03684920710827364
5. Dabae Lee, Yeol Huh, Charles M. Reigeluth, Stephanie Bell, Emily J Summers, and Gail Dickinson. 2010. Project-Based Learning for the 21st Century: Skills for the Future. The Clearing House 83: 39–43. https://doi.org/10.1080/00098650903505415
6. Ezio Manzini. 2012. ERROR-FRIENDLINESS How to deal with the future scarcest resource: the enviornmental, social, economic security. Tha is, how to design resilient socio-technical systems. John Wiley: 56–61.
7. Harold G. Nelson and Erik Stolterman. 2012. The design way: intentional change in an unpredictable world. London.
8. Francesca Ostuzzi, Peter Conradie, Lieven De Couvreur, Jan Detand, and Jelle Saldien. 2016. The Role of Re-Appropriation in Open Design : A Case Study on How Openness in Higher Education for Industrial Design Engineering Can Trigger Global Discussions on the Theme of Urban Gardening. 17, 4.
9. Francesca Ostuzzi, Lieven De Couvreur, Jan Detand, and Jelle Saldien. 2017. From Design for One to Open-ended Design . Experiments on understanding how to open- up contextual design solutions . In Design for Next.

Mapping the invisible: Co-designing with taboos and illegal systems as systemic design materials.
Adrian Paulsen and Manuela Aguirre

Friday 12:00. Room A3.

co-designing

taboos

illegal

systems

workshop

This is a hands-on interactive workshop to work with taboos and illegal systems as reflective co-design materials. As systemic design practitioners, we've experienced that certain (powerful) stakeholders – during giga-mapping sessions – ask (or demand) that particular perspectives or areas are intentionally made invisible (or left out). Reasons vary. Sometimes it is to avoid governmental attention, sometimes it is because systemic components are illegal or would simply be embarrassing to share.

Giga-mapping systems (Sevaldson, 2011) inevitably exposes faults, weaknesses, power relations, and accountabilities. Sometimes these are centered around specific roles – sometime a product of the system as a whole. Sometimes these are formal – and sometimes not. When mapping is done rigorously, these systems are not 'covered-up' – but they illuminate powerful opportunity areas or leverage points. In any case, these factors require careful systemic navigation. As design moves deeper into both private and public sectors, the optimistic, open and empathic design approach is challenged.

That is why we are proposing to curate the conditions where these type of conversations can surface in a reflective, constructive, and confidential way. Building on our previous workshop at RSD3 (Aguirre & Paulsen, 2014) – where we used physical material properties to discuss how invisible relationships shape our social interactions – we will create tangible ways to map the invisible. As an outcome, we expect to co-create an instrumental and practical toolkit that participants can bring back to their own social systems (organizations like healthcare, education, public policies) and shed light on these sensitive issues through a systemic design approach.

Why is this relevant? We recognize – when mapping diverse perspectives in complex social systems – that certain perspectives influence what is represented and what is left out. The strengths of a systemic approach lies in co-creating robust, resilient, and synergic interventions that have an 'appropriate fit' in the social systems in which they are embedded (Banathy, 1996). Therefore, when things are 'made invisible' on purpose – this limits the potential impact of giga-mapping's with regards to holistic understanding – which then in turn inevitably limits the abilities to co-design.

In order to facilitate this discussion, we will either bring sensitive cases from our own practice or – if people are willing and trust is enabled – we will facilitate an anonymous discussion that is relevant to the people in the room. We want to encourage a reflective space that allows for sharing stories, anecdotes, fears, and doubts between practitioners and researchers. In order to assure confidentiality and for trust to be established, a non-disclosure agreement will be provided and all electronics will be securely stored. Participants that join must know that this is work in progress and a prototype in its nature. Therefore we invite participants to come with an

open mind, be critically experimental, and be prepared to co-create actionable spaces for reflection through co-designing with taboos and illegal systems as visible design materials. (Max 20 people)

Aguirre, M., & Paulsen, A. (2014). Using material properties to understand and shape relationships in public and social services. In B. Sevaldson & P. Jones (Eds.), RSD3, Third Symposium of Relating Systems Thinking to Design. Oslo, Norway: Oslo School of Architecture and Design, October 15-17, 2014. Oslo: Systemic Design Research Network. Retrieved from http://systemic-design.net/wp-content/uploads/2015/03/Proceedings-Aguirre-Paulsen-RSD3_V2.pdf

Banathy, B. H. (1996). Designing social systems in a changing world. (R. L. Flood, Ed.). New York: Plenum Press.

Sevaldson, B. (2011). Giga-mapping: visualisation for complexity and systems thinking in design. In I. Koskinen, T. Härkäsalmi, R. Mazé, B. Matthews, & J.-J. Lee (Eds.), Nordes '11, the 4th Nordic Design Research Conference. Helsinki, Finland: School of Art and Design, Aalto University, Helsinki, Finland.

Systemic Design Cases

Design for living in the doughnut: the case of the mobile phone.
Maja van der Velden

Thursday 15:30. Room A4.

lifecycle thinking

mobile phone

planetary boundaries

sustainable design

System thinking (Checkland & Poulter, 2010; Jackson, 1991; Sevaldson, 2011) offers a framework for conceptualising a product as an open system of complex interactions. At the same time, the open system is located within a complex set of planetary boundaries, which form the ecological ceiling for any system on our planet. Research led by scientists from the Stockholm Resilience Center and Australian National University resulted in the Planetary Boundaries framework, which establishes nine "specify precautionary biophysical boundaries within which humanity can thrive" (Steffen et al., 2015).

Economist Kate Raworth (2012, 2017) added an inner circle to the nine boundaries, called the social foundation (see Figure 1). This foundation, based on the 17 sustainable development goals (SDGs), consists of twelve social aspects. Together, the ecological ceiling and the social foundation create a "safe and just space for humanity". Economic activity taking place in this space is, by necessity, "regenerative and distributive". Any other type of economic activity will result in overshooting the ecological ceiling or contribute to a shortfall in the social foundation. How can we design for living the doughnut? I am exploring this safe and just space for people and planet as a design space, taking the mobile phone, one of the most unsustainable, digital consumer goods, as my case.

At the start of 2016, Norway, a country of five million people, had a mobile phone density of 97% (ages between 16 and 65). Even so, two million new mobile phones were sold in Norway in 2016 (Elektronikkbransjen, 2017). The systemic approach taken in my research project informs the understanding of the mobile phone as a product that starts its life in the cobalt mines in Eastern Congo and ends its life among e-waste scavengers and small recycling workshops in India, China or Ghana. Other lifecycles are possible too, but this scenario is quite common. In this perspective, selling two million new mobile phones in Norway in 2016 is a risk to the "safe and just space". The particulars of this risk arevisualised in a so-called Risk Catalogue. The Catalogue presents the social and environmental risks found in the lifecycle of the mobile phone. By combining systems thinking and lifecycle thinking, it

becomes possible to map the effects of design decisions not only in the use phase, as often is the case in critical inquiries in HCI, but also in the resource extraction phase, the manufacturing phase, and the end-of-life phase. Some of the risks can be related directly to design of the mobile phone, while other risks are the effect of other aspects of the product lifecycle, but here design may play an indirect role in sustaining these risks. I my contribution I will map the risks found in the mobile phone lifecycle on the doughnut of social and planetary boundaries and discuss options for intervention through design.Figure 1. The doughnut of social and planetary boundaries

References

Checkland, P., & Poulter, J. (2010). Soft Systems Methodology. In M. Reynolds & S. Holwell (Eds.), Systems Approaches to Managing Change: A Practical Guide (pp. 191–242). Springer London. https://doi.org/10.1007/978-1-84882-809-4_5

Elektronikkbransjen. (2017, January 30). Bransjetall og statistikk. Retrieved 13 April 2017, from https://www.elektronikkbransjen.no/artikler/bransjetall-ogstatistikk/375828

Jackson, M. C. (1991). The origins and nature of critical systems thinking. Systems Practice, 4(2), 131–149. https://doi.org/10.1007/BF01068246

Raworth, K. (2012). A safe and just space for humanity: can we live within the doughnut. Oxfam Policy and Practice: Climate Change and Resilience, 8(1), 1–26.

Raworth, K. (2017). Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist. Chelsea Green Publishing.

Sevaldson, B. (2011). GIGA-Mapping: Visualisation for complexity and systems thinking in design. Nordes, (4). Retrieved from http://nordes.org/opj/index.php/n13/article/view/104

Steffen, W., Richardson, K., Rockström, J., Cornell, S. E., Fetzer, I., Bennett, E. M., … Sörlin, S. (2015). Planetary boundaries: Guiding human development on a changing planet. Science, 1259855. https://doi.org/10.1126/science.1259855

Employing Service Design and Systems Thinking Approaches as tools to support collaboration across a multi-stakeholder initiative: the responsible food consumption exemplar.
Jenny Darzentas, Helen Petrie, John Darzentas

Systems Thinking

Service Design

Community based Design

The application of Systems Thinking to support challenging design interventions in situations that are characterised as being highly complex and human-centric is the subject of this paper. Such situations are increasingly acknowledged as major design problem spaces requiring the participation of multiple stakeholders and use of inter/multi-disciplinary thinking tools.

The situation treated in this paper concerns an initiative to develop innovative directions from different but related disciplines to design services for small communities. This is an ambitious aim in an open-ended project structure that yet still needs to be accountable. What this means is that the project needs to set and meet its own success criteria, when it is not at all clear about:

• the types of opportunities that will emerge,
• whether the collaborations across interests / disciplines are in fact feasible,
• whether the results that are presently envisaged will be commercially intelligible.

One very real expectation is that at a minimum, the whole endeavour will fragment into many small subprojects, each on their own of some value, but none of them able to demonstrate and uphold the vision of the 'big picture' (however vague that big picture might be). Again without some measure of cohesiveness to sustain it, the vision underpinning the initiative will fade and die in time.

What can be done to give some measure of cohesiveness to this initiative? The authors proposed to support the governance of this situation by introducing a Service Design perspective that utilises Systems Thinking. The situation is complex because it is inherently social. The idea has been presented to the participants of the initiative in terms of the value of adopting a shared perspective to their work. There are two parts to this. One is engaging the power of the metaphor of services since the innovation the initiative seeks to create is based on designing services. The other is providing a shared understanding of the initiative using Systems Thinking. That is to acknowledge the problem space as a system, rather than a set of disjointed projects. A shared understanding expressed in systemic terms enables stakeholders to appreciate aspects such as:

• the identification of as many as possible of the stakeholders
• the situation is amenable to design interventions

• the rich interdependencies that are present in a systemic view, and that the approach of an assemblage of small projects will reject or ignore

• the necessity of negotiating and creating a collective understanding.

• that there will be outcomes, both favourable and not so favourable, that cannot have been foreseen at the outset, (and that these are the result of the 'system's emergent properties')

• what systemic notions such as those of 'requisite variety', of 'self-organisation', of 'self-reference' may mean and what they may offer in this design space .

Adopting the systemic perspective does more than give a shared view, it also gives a shared vocabulary with which to label developments, or to actively seek outcomes. It legitimises the need to network and to spend time on areas where one is not considered an expert, to acquire new knowledge and learn new ways of doing things, and to break down the conventions and cultures that sustain working in siloes with peers and in mutual appreciation of each other's work, with little time or incentive to look 'over the fence' into another disciplinary area, or way of doing things.

In the case of designing services for small communities the initiative described here recognises that stakeholders are traditionally independent actors with their own individual ways of working. The task is not to adopt a common vision, but to find ways to work within a similar interpretation of the situation and what needs to be done, that is comfortable and worthwhile for each stakeholder. It is commonly acknowledged that it is difficult to move towards some flexibility in previously held ideas and interpretations of a vision, and if not review them, at least lay them open to scrutiny by others. Our fieldwork so far has made use of the co-creating service design paradigm, as robust means to engage participants and work towards the shared systems based perspective.

In this working paper, we describe the work on one relatively small scale but multi-disciplinary project that involves experts from the domains of computer science and HCI and archaeology. The overarching aim of the project is to leverage the work of groups of amateur archaeologists who organise themselves to collect data, for various purposes. This data is collected in a way that makes sense to the individual groups, but the data itself can be useful to other groups of people, including professional academic archaeologists and historians, as well as interested citizens.

In the particular case we are looking at a group that has self-organised to collect data about their churchyard cemetery. Their starting point is taking a church graveyard plan of grave plots, and checking that the data about who is buried there is accurate. At weekends and in their spare time, the group meets to make measurements of the plot and its location, to photograph headstones and other ornaments, and to transcribe inscriptions. As they have progressed in their work they have sought the help of other groups with registering GPS locations, with using Reflectance Transformation Imaging (RTI) (a kind photography which magically reveals inscriptions not visible with the human eye because of erosion) etc. In addition, various members of the group have accommodated their own interests, for instance one is interested in photography and is the RTI expert, another one is collecting additional data about stonemasons who were responsible for the carving and inscriptions, while yet another interest is in the different types of headstones. As with all such groups, time is of the essence, as the artefacts they seek to record data about are intensely vulnerable to erosion and the passage of time. The group also maintain and run a blogspot, which gives regular accounts of activities http://embsay-research-group.blogspot.co.uk and give talks about their work to other groups in a network of such amateur groups. In addition, the blogspot writer is talented at bringing out the human and storytelling aspects of their work, making the blog enjoyable to read. http://embsay-research-group.blogspot.co.uk/2017/01/ The initial aims of the academic stakeholders were threefold: to understand the aims of the group and

see what technological interventions might support the existing practices (of recording data and inputting into a system) and how these should be designed so as to be valued by users (easy to learn and use, and better than existing paper-based collection methods(HCI); to see how the data collected might be formatted so that it fits with the already existing metadata schema for such data so that the and then can be searched over (Archaeology); and to see how best to support this team, and other such communities, in their endeavours (Systemic Design).

From our point of view, our design problem space was that of stakeholders who were working well independently, and contributing to the large vision, although not in any well-formed way. We had a sense that although the group might disband and go their separate ways once this project was over, although the experience was already spawning interests that could be developed further by individuals, as well as inspiring others to join them to form new communities.

What is of interest to the systemic design community was the use Systems Thinking to learn and understand and capture a Holon which includes these communities. That way, amongst other things, the motivations of the stakeholders are be uncovered. As a result it should be possible to map these to form new directions, or to give voice to previously unexpressed aims and interests. After meeting, the group by themselves, reflected on their activities and summarised them as follows:

With the fresh viewpoint, we can begin to really appreciate how far we have come – our little team of enthusiasts has been able to combine a range of skills, knowledge, and interests to bring together a fascinating project with multi-faceted perspectives which happily complement each other nicely:

• Updating and amending the parish church records
• Raising awareness of the churchyard as a local heritage asset
• Developing and sharing skills in RTI photography
• Revealing and recording previously unreadable monumental inscriptions
• Providing information in response to family history enquiries
• Developing a successful working partnership between local people, church members and local heritage groups
• Developing and researching specific interests – stone masons, iconography, cultural significance of memorials, changing artistic styles of local memorials
• Engaging with the local primary school
• Offering graveyard tours as a way of promoting interest in local history

http://embsay-research-group.blogspot.co.uk/search?updated-max=2017-02-10T14:58:00Z&max-results=7

It is with such a set of ideas that the design interventions might go forward to help to implement some of these directions. Accordingly, technological support can be designed to be multi-purposed, serving both some of the soft, but extremely important, objectives (developing successful working partnerships between local people, church members and local heritage groups) while implementing clear hard goals (a common way of updating and amending parish records about graveyards).

Taken back to the multi-stakeholder innovation initiative, this project serves as an exemplar for other small scale community projects. In systemic terms, the project has, through the interests of the stakeholders, recognised, amongst other things, emerging themes and properties in their world:

• the Embsay research group primarily working on updating and amending parish records, but who as individuals themselves have many other co-existing interests and motivations:
• the academics, coming from different disciplines, also with differing expectations about methodologies and end goals.

Getting together to articulate the big picture raised the work from being simply technological support in terms of a handheld application to support the current needs of recording data, to understand the possible directions. The next step is to formulate ways to move the big picture into design interventions, inspired by the paradigm of service design (i.e. services are the main output, even if these are delivered with technological support). For this, the boundaries, interrelationships and functions of each of the directions need to be articulated, in order to understand where the interdependencies lie, and how some functions may affect interrelationships. For instance, an insistence on using a handheld app to collect field data may obviate the need for the transcribing work. However, this could mean the sessions that take place in people's homes, especially when the weather is bad, will not be necessary, and will break down this teamwork aspect.

The expectation is, that if each of the small community projects is able to report back, not just on the implementations they have developed, but on the results expressed in systemic terms (boundaries examined, elements considered, interrelationships revealed, and functions (or activities) existing or desired, then there is a possibility to compare projects and potentially apply findings from one to another, in order to create and maintain collaboration that is both initiative-wide and of practical use.

COLridor at Zvonařka: Co-Design and Co-Living for Sustainable Futures.
Marie Davidová and Kateřina Zímová

Thursday 16:30. Room A4.

bio-top

bio-corridor

co-design

co-living

systemic approach to architectural performance

systems oriented design

giga-mapping

performance oriented architecture

non-anthropocentric architecture

The old garden of log-house Zvonařka with adjacent Nusle Stairs is Prague's nature like bio-tope with remarkable diversity (see Figure 1) and together with the adjacent railway, parks and gardens generates rare bio-corridor within the city centre. As it is located in one of the most expensive residential areas, the pressure on its building development is high. In 2011 a large apartment-complex design was submitted

for permit, arguing for keeping the greenery character due to its green roofs (RH-Arch, 2011). Neither previous, nor recently proposed metropolitan plan lists the area for protection (Institute of Planning and Development Prague, 2016). From the personal conversation with its creators, the Institute of Planning and Development Prague has its interest in increasing city's density, not extending its bio-corridors and bio-diversity. The plan is neither co-designed with ecologists nor with local communities or NGOs. It is created purely by urbanists, marking the areas in the plan from the table. As also confirmed by the Concept of Metropolitan Plan Justification, the plan does not consider "details" (Kubeš et al., 2014). It also states that for the reason of being behind the range of land planning, the design is not done in respect of European Commission's strategy of Green Infrastructure (European Commission, 2010), but instead, the term Landscape Infrastructure is used (Kubeš et al., 2014). This term is not respecting the complexity of the strategy. First author's architectural NGO Collaborative Collective (Collaborative Collective, 2012, 2016) fixed through cooperation with second author's ecology support and evaluation focused NGO CooLAND (CooLAND, 2016a, 2016b) first ecological pre-study (Zímová, 2016) for reasoning its relevance, building on and submitting detailed investigation for funding.

Within spring semester 2017 a fully transdisciplinary systems oriented co-design studio course will be led by Collaborative Collective and CooLAND among the Faculty of Art and Architecture at TU of Liberec (architectural and environmental design students), the Faculty of Forestry and Wood Sciences (forestry and wood engineering students) and Faculty of Living Environment (ecology students), both at the Czech University of Life Sciences in Prague, the Faculty of Humanities Studies at the Charles University (students of social and cultural ecology), local community and the local environment (see Figure 2). This 'GIGA-mapping' (Sevaldson, 2011, 2015) and 'full scale realisation prototyping studio' (Davidová & Sevaldson, 2016) will focus on supporting the local bio-tope by building shelters for habitat of i.e. bats, insects or homeless people. The design process, prototyping and further local development will fully engage local specific environment together with the local community. In this sense it is not only participation but co-design . Here the co-design method involves both, biotic and abiotic agents within so called 'Time Based Design' investigated by Sevaldson (Sevaldson, 2004, 2005, 2017) where the project does not end by the building finalisation. This project is to motivate humans to co-live with other species and among each other across the social differences. The common events such as honey harvest from planned bee-hives should support the eco-system through 'urban prototypical interventions' (Davidová, 2004; Doherty, 2005). This 'non-anthropocentric architecture' (Hensel, 2013, 2015) was concluded by first author's previous study on performance to be at the end also most beneficial for humans (Davidová, 2016). It is therefore alarming that though the UN agenda for 2030 sustainable development is calling for collaborative partnership of all stakeholders and fight of poverty while being determined to ensure that economic, social and technological progress occurs in harmony with nature to reach prosperity (United Nations, 2015), its goals are so anthropocentric, that 'Cities and Communities' are discussed in separate goal (United Nations, 2015, 2016a) from bio-diversity, discussed in 'Life on Land' goal (United Nations, 2015, 2016b). These goals are not in any sense cross-referenced. As opposed to this human-centred approach, this project is to demonstrate the relevance of consideration of human settlements as being part of overall eco-system. Through generating public awareness and pride for the local specificity and community, we believe the bio-corridor will be marked into Metropolitan Plan and no future building development in the precious garden will be enabled. Through this 'Ecological Urbanism' that involves 'anticipation, sensing, curation, collaboration, production, interaction, mobilisation, measures, adaptation and incubation'(Mostafavi & Doherty, 2016) , our politics is going from the bottom up!

Co-designing a real-world laboratory for systemic design in the Italian Alps: how complexity shapes the process.
Tobias Luthe

sustainability transitions

place-based research

experimentation

boundary objects

scaling effects

Real-world laboratories (RwL) are part of a dynamic family of sustainability research settings, i.e. living laboratories, urban labs, or social innovation labs. They share the idea to use experiments in real-world settings to understand and shape societal transformations towards sustainability. RwL create spaces for transdisciplinary research, developing and experimenting with potential solutions to complex sustainability challenges. They provide opportunities for informing global sustainability through place-based research and systemic design, and help define context-specific pathways towards sustainability.

On the case of the RwL MonViso Institute (MVI) in the Italian Piedmont mountains, demonstrated on a number of concrete examples and experiments, we explore the RwL approach for improving the understanding about systemic design and social-ecological transformations and how they differ from current modes of research. We pinpoint challenges and opportunities to inform the transfer to global sustainability from place-based, context-specific pathways towards sustainability, applying the RwL concept of combining transformation, experimentation, transdisciplinary (TD) collaboration, long-term orientation, transferability, learning and reflexivity. The interdependency of these characteristics is showcased by different experimental settings at the MVI, for example with University groups engaging in TD and systemic design research on-site, while critically reflecting, presenting and cognitively evaluating results and effects with local stakeholders and international audiences on a global scale.

The systemic design process of building the MVI as RwL and demonstration hub for systemic design is complex and guided by this complexity. We illustrate this on a number of examples: for instance, balancing local traditional knowledge, local building regulations and necessary innovation in building materials and techniques is both systemic design and a later-used demonstration of it. The doing and the demonstration of systemic design are interwoven and feedback into each other, which make the SD process quite complex, leading to conceptually

less-systemic design decisions that actually only demonstrate the reality in doing systemic design in a real-world setting. Thus, the inherent complexity that becomes obvious only in the doing is shaping the process of developing the MVI. Further examples are funding or social inclusion, while all are connected.

Finally, we reflect on the MVI design as RwL applied to different scales of transformations. The specific challenges and benefits imposed on the MVI RwL, given its location, provide insights into labs as boundary objects and on their typologies to connect sustainability research and systemic design across scales.