Change Lab/Design Lab for Social Innovation

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Change Lab/Design Lab for Social Innovation: a thought piece for the development of a new approach for building capacity for social innovation in Canada

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Executive Summary

The following white paper is designed for two purposes. The first is to provide an overview of the origins of the concepts informing Design Labs/Change Labs in general. We note that the concept is the integration of very specific and sophisticated expertise drawing from at least four distinctive academic/scientific traditions: a) group psychology and group dynamics, b) complex adaptive systems theory, c) design thinking, and d) computer modelling and visualization tools. The intersection of these traditions offers a rich conceptual ground for the development of breakthrough solutions to intractable problems arising in the context of complex social and ecological system interactions. These demand a number of elements to be successful including: a) high expertise in data gathering, facilitation and process design; b) a carefully designed process that includes a number of generic elements; and c) the selection of appropriate problems or design briefs, for which the Change Lab is best suited. In short, Design Labs/Change Labs are not only a new form of collaboration or a way to convene interested stakeholders to discuss change, but also a particular social technology that combines the best of a number of pre-existing social technologies. They can be a powerful tool, but only if the requirements are respected.

The second purpose of this paper is to provide a basis for a discussion among interested funders and experts about whether and in what way the Design Lab/Change Lab concept can be modified to forward the social innovation agenda. The fit would seem to be ideal. The social innovation framework also draws on thinking in social psychology and group dynamics, as well as on complexity theory. It privileges products, processes, ideas or designs that bring new components together in new relationships for breakthrough solutions. It therefore is informed by thinking on the dynamics of innovation and on the role of design in those dynamics. Lastly, due to its reliance on complex systems perspectives, it can be considerably aided by simulation modeling and visualization tools. Remaining questions are many, including whether such SI labs might be place-based or virtual, how many generic processes should be

associated, who customers for change labs might be and what particular elements would make social innovation labs distinctive.

1. Introduction

Scientists and activists concerned about the future of human society and the planet have pointed to the urgent need for sustainability transitions (Clark 2001; Raskin et al. 2002). Due to the complex, systemic and interrelated nature of the serious social, economic and environmental problems confronting us, we need new forms of problem solutions. These may require radical, systemic shifts in deeply held values and beliefs, patterns of social behaviour and multi-level governance and management regimes. In addition, we will need to harness human creativity and innovation potential in order to tip the interlinked social and ecological systems in the direction of greater resilience and sustainability.

In the last 2 years, there has been an explosion of interest in what have been called Change Labs or Design Labs. The need to find new processes to support whole system transformation and assist people in government, civil society or the private sector to find solutions to complex and intractable problems has grown continuously more pressing, at the same time at which government resources are becoming more precarious. Such Change Labs offer a place for creative, cross-sector and cross-disciplinary decision-making and innovation. The process is supported by careful design and facilitation and is resourced by research geared to the decision maker's needs. The focus is on those "wicked problems" that seem insoluble, and reconciling seemingly antithetical elements such as the need to grow the economy and to maintain environmental services, or to maximize both short term profitability and long-term sustainability (Banerjee 2008; Bason 2011).

In this paper, we will: 1) review the intellectual origins of the change lab idea, 2) identify the definitive elements of Change or Design Labs, 3) review examples of the most sophisticated change labs, and 4) present a proposal for a social innovation Change Lab.

2. Design or Change Labs: What are They?

Change or Design Lab processes bring together a variety of stakeholders to develop a common understanding of a problem space, from which the stakeholders can design innovative new solutions. The most in-depth of these processes extend for months or years through multiple iterations of information collection, analysis, creative engagement and prototype development. A permanent Change or Design Lab can conduct multiple processes along these lines simultaneously and, more importantly, continually develop new techniques and improve upon existing approaches.

Such Change or Design Labs provide more than just a new arena for collaboration, although they share some aspects with the whole systems approaches that became popular in the last half of the 20th century. They are not just the direct application of processes used in traditional, technical and environmental design, although they do stress prototyping and applied outcomes, as well as draw directly on the language of design thinking. They instead represent a rich integration of knowledge drawn from several decades of work done around group psychology and dynamics, whole system and

complexity theory, design thinking and computer visualizations and simulations. Understanding these origins can help set the boundaries of what Change/Design Labs are and are not.

3. History and Origins of Design/Change Labs

Change Labs represent the coming together of at least four disciplinary and theoretical streams:

A. Group dynamics and group psychology
B. Complexity theory
C. Design thinking
D. Computer modelling and visual language

A. Group dynamics, group psychology and complexity theory:

In the period between 1940 and 1970, the Tavistock Institute in London was developing a theory of group dynamics and change based on psychoanalytic interpretation, and extending it to the concept of group dynamics. Here, Wilfred Bion's work was profoundly influential (Bion, 1961). It gave rise to the notion of group psychology, group therapy and group dynamics. Meanwhile, Kurt Lewin, one of the other fathers of group psychology, created the National Training Labs in the US with the support of the US Navy and the National Education Association. The NTL was based on the idea that learning and behavioural change was most easily facilitated in the small group environment. According to Lewin, this was further accelerated by creating cultural islands – remote settings where participants were separated from their daily lives. Over time, the approaches for learning and group change identified at NTL became the basis of the organizational design and development of process design and group facilitation, and the NTL became a major training facility for the first consultants specializing in this field. (http://www.ntl.org/inner.asp?id=178&category=2).

Researchers at Tavistock and NTL interacted in a series of conferences entitled the Macy Conferences (Montagnini, 2007). Between 1946 and 1953, ten meetings were held and participants included Ross Ashby, Julian Bigelow, Heinz von Foerster, Ralph Gerard, Molly Harrower, Paul Lazarsfeld, Kurt Lewin, John von Neumann, Walter Pitts, Leonard Savage and Norbert Wiener, Gregory Bateson, Margaret Mead and guests including Erik Erikson, Claude Shannon and Talcott Parsons. It was here that psychoanalytic and group psychology thinking met open systems thinking. These conferences are usually considered to have created the origins of cybernetics.

B. Complexity theory and group psychology come together:

In the late 50s and early 60s, Eric Trist, a social scientist working at Tavistock, combined these two streams of thinking (open system theory and group psychology/dynamics) into a theory of change in whole social systems. Trist was the first to address the notion of whole system problems or "megamesses" as he termed them (1963). Trist felt that we acted like

systems in creating large system problems, but we acted like individuals in trying to solve them. If we were to find a solution to these broad problems confronting us, we needed to respond as a system. Trist felt we needed to get the "whole system into the room." Processes were designed and facilitated in accordance with the best thinking in group dynamics and group psychology, but the content was left to emerge and self organize in accordance with the tenets of complex/open systems thinking. The result was the Future Search process, one of the first robust whole system approaches (now expanded to include Appreciative Inquiry, Deliberative Dialogue, World Cafes and Theory U type processes among others). The theoretical underpinning of Change or Design Labs is therefore rich; it is heavily tied to developments in design, organizational and process management and complexity theory.

C. Enter Design Thinking

In the early 21st century, however, these "whole system technologies" were married to the field of design. Wikipedia defines design as:

> (noun) a specification of an object, manifested by an agent, intended to accomplish goals, in a particular environment, using a set of primitive components, satisfying a set of requirements, subject to constraints;
> (verb, transitive) to create a design, in an environment (where the designer operates).

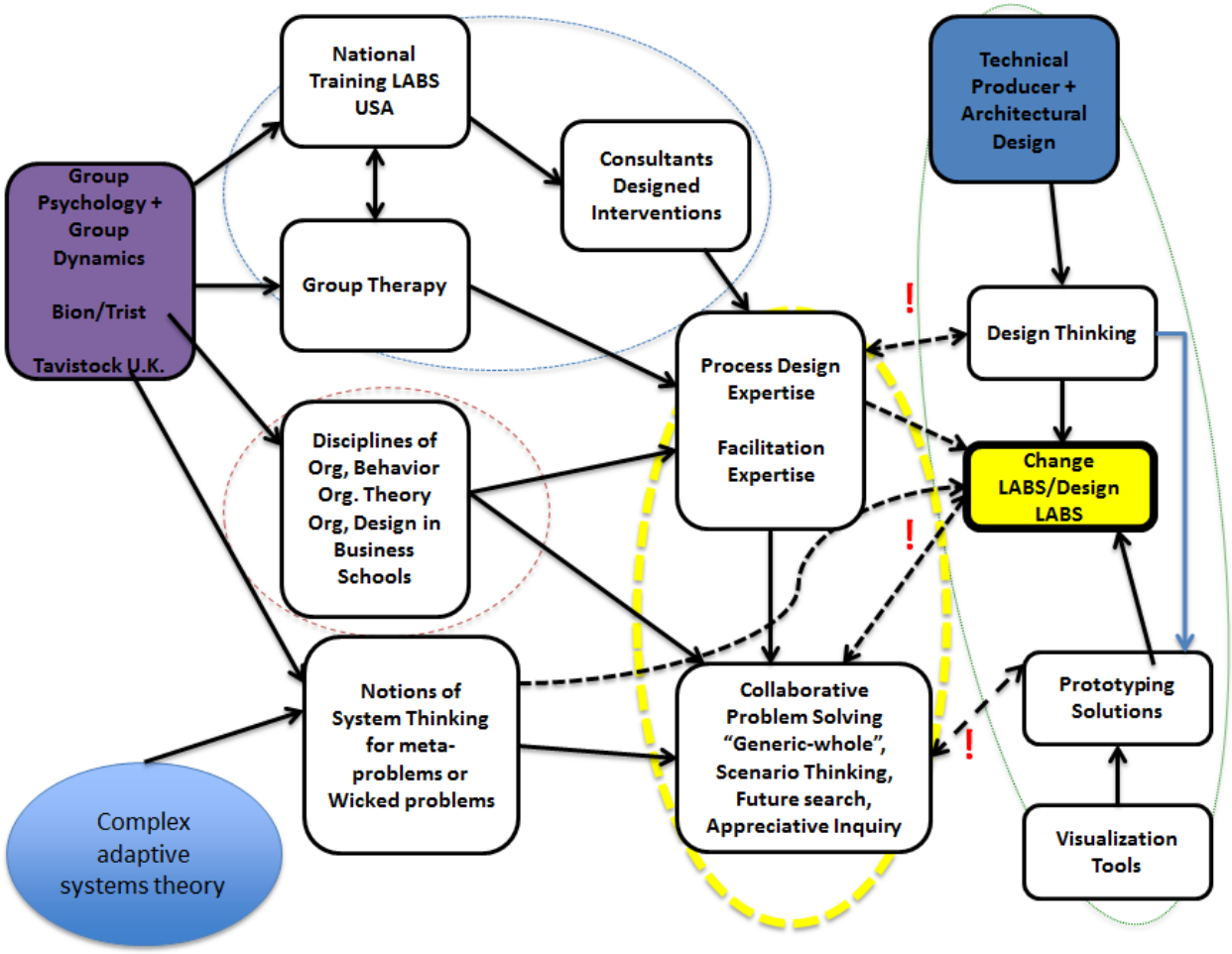
While humans have been designing objects and technologies since the stone age, design became a field of study and expertise sometime in the late 19th to early 20th century. Throughout the 20th century, the concept of design was largely used to refer to the creation of physical objects or spaces. The notion of *process* design may have originated with automated assembly lines, but complex process modelling and design developed in parallel with the capacity of computers to model and simulate interactions between numerous components through time. This was initially most closely associated with chemical process modelling, defined by Wikipedia as:

> a computer modeling technique used in chemical engineering process design. It typically involves using purpose-built software to define a system of interconnected components, which are then solved so that the steady-state or dynamic behavior of the system can be predicted. The system components and connections are represented as a Process Flow diagram. Simulations can be as simple as the mixing of two substances in a tank, or as complex as an entire alumina refinery.

However, it was not until the late 20th century that organizational development specialists began to refer to process design in reference to the activity of creating and facilitating group problem solving processes and the kind of whole system processes that Trist and others had developed. Then, in the mid 2000's, a number of well known designers, including Canada's

Bruce Mau and Tim Brown from IDEO, stepped out to make the claim that "design thinking" could be used to talk about "massive change" or breakthrough thinking in complex problem domains (Berger, 2010; Brown, 2009; Kelley and Littman, 2005).

The "elective affinity" between this thinking and that of "whole system design" thinking was obvious. Whole system thinking contributes the sensitivity to group processes and dynamics, the notion of social islands and the idea of convening the "whole system" in the room. However, its emphasis remains on problem solving and system change through collaborative action. Design thinking adds precision about the design process (emphasizing the importance of collecting good data in advance, the importance of a clear design brief and how to construct it and the notion of rapid prototyping) and adds the specific focus of breakthrough thinking for (social) innovation. Together, they make up the elements of the Change or Design Labs currently being run in such places as MIT and Stanford, as well as by such consulting firms as REOS and Participle.



D. A Useful Addition: computer based modelling and visualization tools

Finally, developments in computer simulations have radically increased the power of simulation and visualization. This can support rapid prototyping and sensitivity testing, and can make it possible to play with scenarios. Simulation has strong historical ties to each of the three other threads described above, and can play an important role in supporting effective Change Labs.

Both early systems theory (which informed the development of group dynamics and group psychology) and complexity theory built on early computational insights into the dynamics of systems. The earliest work in systems theory was inspired in large part by developments in WWI and WWII of control theory models that included feedbacks to help war planes fly better (Lewis, 1992). These original mathematical insights found wide applications in understanding numerous systems including human systems. The idea of feedback supporting a person to change behaviour came out of this. Ludwig von Bertalanffy drew on them for his General Systems Theory. Other systems dynamics models included those by Jay W. Forrester and his colleagues at MIT (Richardson, 2011).

Complexity theory was inspired in large part by the discovery of complex patterns. In particular, by the discovery of chaotic attractors (systems that were fully deterministic and cycled within the same range indefinitely, but never cycled through exactly the same pattern more than once), and by the results of simulating multiple interacting agents. Startlingly, these systems produced patterns that seemed to mirror numerous natural and social systems. Computer simulation made it possible to explore the rich patterns that these classes of systems created.

Computational simulation also has strong ties to design. Rapid prototyping in simulation makes it possible to test ideas and understand the implications of decisions. Simulation not only uses no materials; but once the designer specifies the design, there is no additional manufacturing time needed and he or she can modify the simulation to explore a range of alternatives. In parametric design, an approach that increasing numbers of engineers and architects are using, the designer defines relationships rather than numerous individual numerical values for each part. Rather than saying the wheel of a car is two feet across and its height is 6 feet, for instance, he or she might simply say it is three times the wheel height. In a good parametric model, changing just a few variables can transform the whole system (Woodbury, 2010).

While there may be a few exceptions that are more specialized, in general, Change Labs draw on the relatively narrow subset of models that are useful for groups working together to understand systems. In the context of design labs, the interface that allows participants to imagine and refine alternatives together matters as much as the implementation of the algorithm. Our capacity to build models that explore how sophisticated systems behave under different circumstances often outstrips our capacity to develop models as tools for

thinking with. Computational simulation is ubiquitous in understanding mechanisms or preparing for manufacturing; detailed models of everything from the neuron to the economy to the climate promise both explication and guidance; and people spend increasing portions of their time immersed in game simulations like Second Life, Civilization or SimCity. A far smaller portion of simulations leaves its interface open and clearly explains its limitations so that designers and decision makers can modify the assumptions or the inputs as part of thinking through their response to a problem. Even fewer make these capacities so accessible that groups can use them constructively to build and explore models together.

Numerous systems change processes already use mapping and prototyping to help participants to understand and engage with systems. If it is handled well, simulation and visualization can play a powerful supportive role. A number of groups have explicitly built models as tools for thinking with.

For example, the Conservation Breeding Specialist Group (CBSG) brought together policy makers, biologists, people in the field and others in species protection meetings to work together to save species. As part of these workshops, they developed a tool that let policy makers make decisions in simulation and understand the effect those decisions could have on particular species. These proved remarkably effective for increasing decision maker's understanding and as a tool to support decision-making (Lindenmayer et al., 2000).

Another example is John Robinson and Jonathan Salter's research group at UBC which developed visualization software to be used with members of the public and decision makers to understand the implications of their own action beliefs and values. The models don't provide right or wrong answers, but they can reveal contradictions within a persons own choices and beliefs. The city of Vancouver used the models to host public sessions to engage with people about trade offs in environmental decision-making (Tools for Modeling, Visualization and Community Engagement, 2011).

Neither of these models is the most sophisticated of its kind, but both let users interact with and explore them and so enriched the way they thought about a problem.

The second area with direct application to Design or Change Labs is the dramatic recent improvements in the tools available for visualization and display. Interactive whiteboards and tabletops make it possible for groups to see and manipulate information together. Tools for producing infographics that clearly show the relationship between different data are becoming much more widely available. Hans Rosling was among the most popular speakers on TED for his presentation on plots of statistics because he made them so beautiful and compelling (TED, 2006). He has since made his tools publically available. Wide dissemination of smart devices like the iPhone make it so that, with clear design and sufficient support,

even in larger groups individuals could make their own explorations and answer questions using their own devices to feed into a collective design process using some simulation.

Simulation and visualization is an area that has tremendous potential for helping people to understand complex systems. Mapping and prototyping is already widely used in design processes, and future work will make better models that are easier for participants to understand and manipulate, and will more deeply embed compelling visualizations into the toolset available to support Change Labs.

4. What are the elements that make a successful Change or Design Lab?

Each Change or Design Lab has a unique approach that it takes to design, research and experimentation. However, there are a few common elements which appear to be built into each successful model.

a. **Broad-based research** is used in each change-making workshop to provide a substantive evidence-base for understanding complex systems. This research is at times deliberately qualitative, as a supplement to statistics and quantitative data more generally available, and to get the voices of others into the room. However, across all labs, it is not reliant on a single methodology, like ethnographic research, focus groups, population statistics or service usage data, but instead brings a variety of information sources together – including all these – to build a holistic understanding of the problem space. It should be noted that the research stage involves two parts: "research in" which helps to deepen and focus the design brief and "research out" that helps to determine how the focal problem is seen by a broader community.
b. **Co-creation of solutions** reaches across sectors and silos with a goal of citizen engagement. The workshop itself will include a carefully chosen group of decision makers, representing a variety of viewpoints and including those capable of implementing solutions. The greater the diversity, the greater the potential for innovation. However, diversity also requires careful process design and the right tools to allow diverse decision makers to come to break through solutions together.
c. **Specialized physical environments** create spaces conducive to creativity. Physical space correlated with creativity also signals a complete departure from routine. This "bounded space" helps to manage the sense of risk associated with departing from a role.
d. **Clear process design and facilitation** provide all participants with a sense of where their workshops are going and how the work they are currently doing researching, sense-making or prototyping will fit into broader system change. Processes are used to ensure that participants are all able to effectively provide their analysis and creativity to the Change or Design Labs. Processes are there to provide the direction and put momentum behind a change-making project, not stifle its creativity.
e. **Rapid prototyping** is used to quickly model elements of the problem space and solutions to problems. These prototypes provide tactile models that can help participants quickly think through the implications of a wide variety of system interventions. This provides a greater

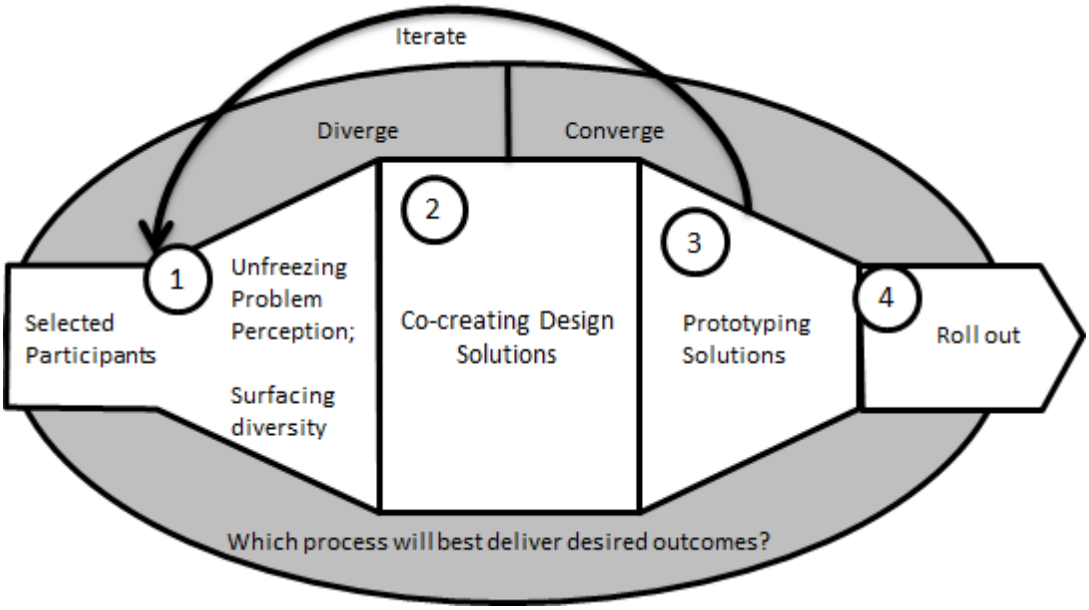
understanding of system dynamics than research alone and eventually is the breeding ground for the creative solutions that will ultimately be implemented.

f. **Multi-disciplinary support staff** provide research and prototyping support for participants. The timely provision of support ensures that participants can spend their time working rather than waiting for requested information and prototypes to arrive. Here the multi-disciplinary aspect of the staff is important as there will be a wide variety of requests made upon the staff and a broad range of expertise is needed to quickly adapt. Chief among the expertise involved are: design skills (both technical and process), facilitation skills, ethnographic skills and political/collaborative skills.

g. **Continual learning** by the Change or Design Labs staff itself allows the Change or Design Labs to build upon the supports they offer. Change or Design Labs develop libraries of tools and methodologies to facilitate participant engagement, and internal training programs for staff. To thoroughly build this expertise, most Change or Design Labs are either a part of or heavily collaborate with academic institutions. The Change Lab staff also support the roll out of solutions and, in the process, learn and adapt the solutions, as in an experiment.

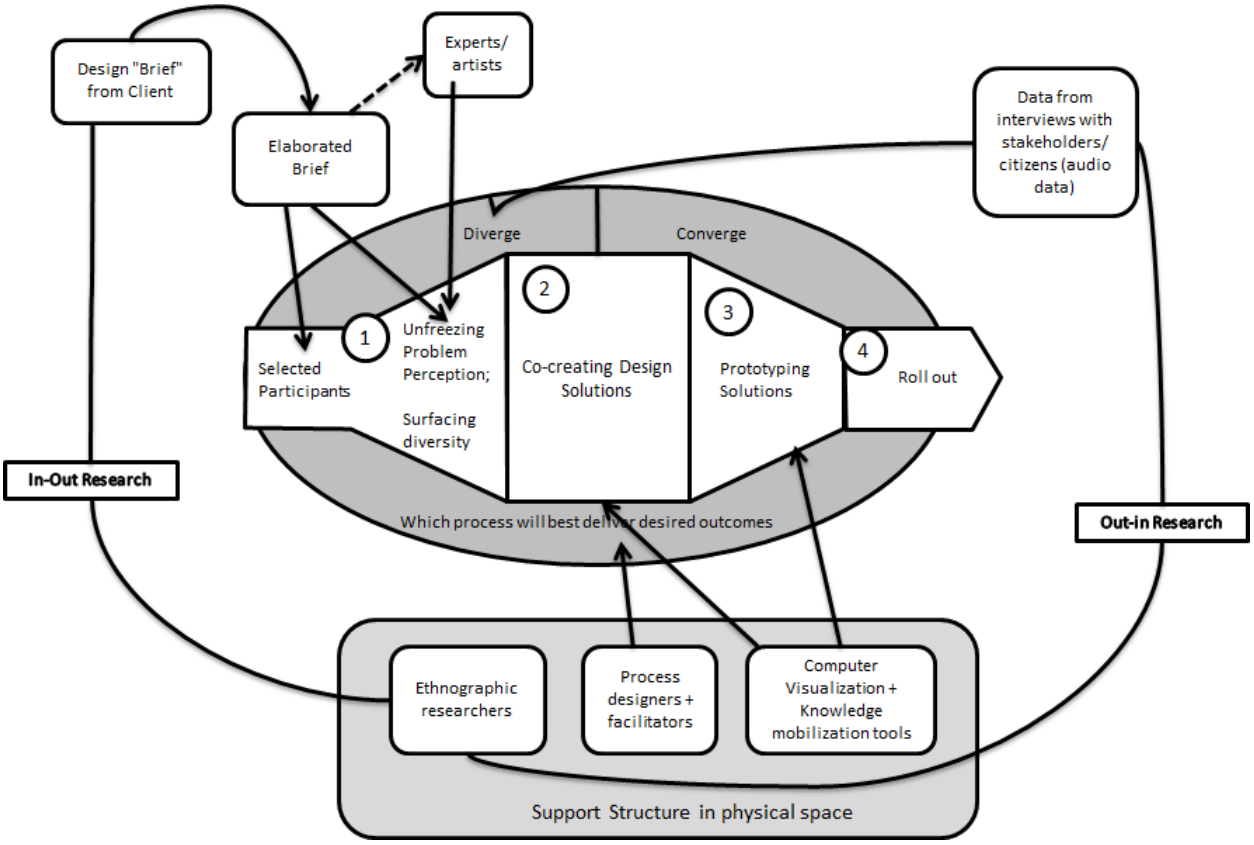
The most in-depth workshops will be operational for months or even years, although the simplest mini-workshops can be conducted over the course of a day. All bring together a selected group of participants, seek to open up a range of divergent views to bring a broader understanding of the problem space and then have those views converge upon a set of solutions that can be brought out. Broadly, this process has four steps:

1. The participants unfreeze their understanding of the problem space, surface their diverse viewpoints and learn about different understandings of the space.
2. Participants develop common understandings of the problem space and use that as the starting point to co-create design solutions.
3. Solutions are prototyped and quickly tested. From here, what is learned can lead back to (1) with a further deepening of the problem perception and another iteration of the unfreezing, co-creation and prototyping process.
4. At some point, prototyping leads to the selection of a set of design solutions that participants feel comfortable rolling out as a system intervention.

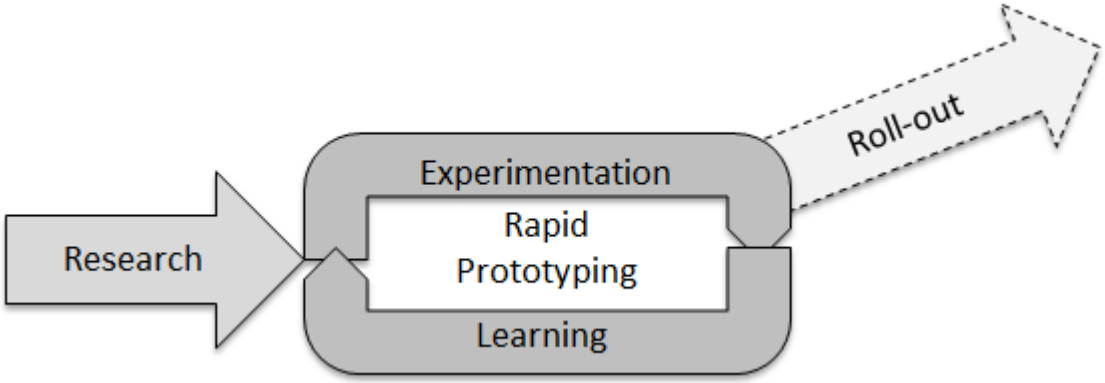


5. Change or Design Labs: Key Examples

Denmark's MindLab is a collaboration between three government ministries that seeks to break down the silos between organizations and build the space to develop creative cross-sectoral innovations. They have developed a long-term process that involves frequent iterations and a constant reframing of the problem space so that ministry staff, business leaders, non-profit executives and citizens have an opportunity to view complex problems from each other's perspectives. Problems the MindLab has broached include reducing government red tape, youth employment, gender equality and climate change.



MindLab's infrastructure greatly enhances the effectiveness of these processes by giving participants access to strong research and design support. Research evidence from a variety of sources – statistical, ethnographic, simulations and others – are brought in to provide participants with different lenses through which they can view the problem space. As quickly as possible, MindLab processes also prototype simple physical models, diagrams, role-playing exercises or visualizations to help provide substance to the ideas being considered. A skilled design team can use these "first steps" to provide small-scale, low-cost experiments that can generate interesting additional evidence people can use to better understand complex problems.

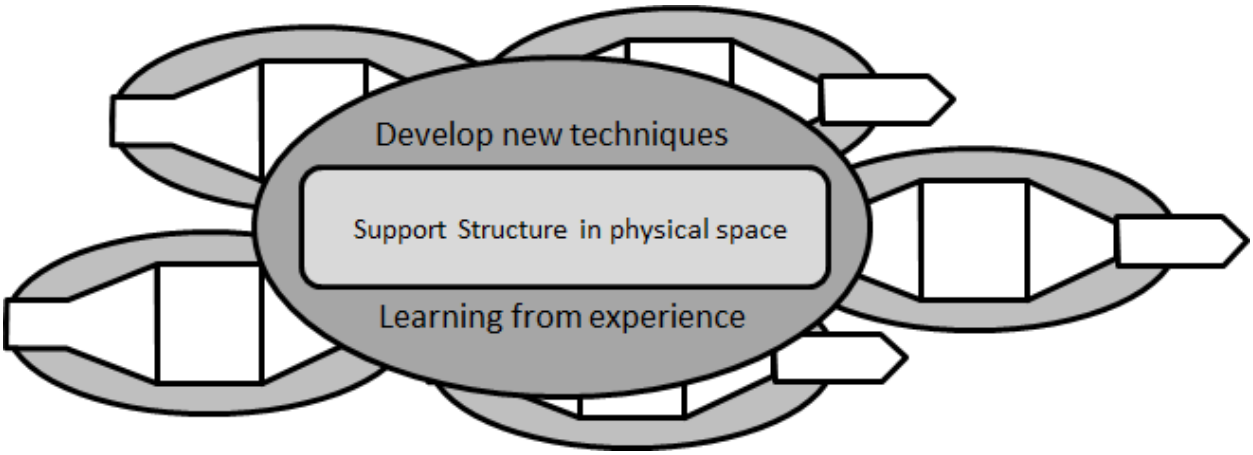


The Massachusetts Institute of Technology Media Lab runs on its prototypes. At any given time, the MIT Media Lab has dozens of prototypes at relatively advanced stages of development, and many dozens more in early phases. Only a handful of these will ever be rolled out at a larger scale, but the development of those early prototypes provides the space for experimentation and learning which can then be applied to other, often immediately unrelated, designs.

Within the dynamic system that a workshop becomes there are a variety of places for external intervention and support. From the start, the selection of an appropriate group of participants and a design "brief" frames the entire development of the workshop process. Experts, artists and designers inform the participants as they enter the divergent phase of the process, and the collection of research and contracting of new workshop-specific research will inform that development. Finally, the support of the Change or Design Lab's infrastructure – both physical and human – facilitates quick, creative development.

Having multiple Change or Design Lab processes underway at any point in time provides enough demand to necessitate a specialized support space and staff. The specialized space of the Change or Design Lab allows the physical architecture to be built to facilitate the workshop process and provide a space away from participants' day-to-day workspaces, allowing them to more easily reframe their thinking about complex problems. Where the most powerful transformative impact of a Change or Design Lab comes about is when the permanent staff and facilitators can learn meta-processes from the successes and failures of each individual workshop that goes through the lab. This further development of process design and management skills can improve the effectiveness of the Change or Design Lab itself by experimenting with new processes and improving the training the Change or Design Lab staff can offer participants.

At the Stanford Institute for Design, or d.School, higher education is built into the Change or Design Lab. Courses in design are offered to graduate and professional students from any department at Stanford University. In addition, the d.School posts a variety of videos and documents online demonstrating the tools that have been developed at d.School and the stories of how they have been used.



Websites:

MindLab http://www.mind-lab.dk/en

d.School Stanford: http://dschool.stanford.edu/

MIT Media Lab http://www.media.mit.edu/

Alia Institute http://www.aliainstitute.org/track/solving-tough-problems-the-change-lab-approach-to-co-creating-new-social-realities/

6. Proposal for a social innovation based design for an Innovation Change/Design Lab

Change Labs focusing specifically on social innovation would contribute in important ways to the ecology of Change Labs and processes and would address core questions in social innovation.

Social innovation researchers are singularly well positioned to understand the patterns by which ideas that cannot simply follow a market driven product adoption cycle propagate into the market. A social innovation framework emphasizes the development of alternatives and solutions, but places more attention on the processes by which those alternatives become deeply integrated into systems and ultimately influence the belief, resource and authority flows of the system.

Social innovation Change Labs would not work in isolation but are a natural keystone to anchor and maintain a whole ecology of social innovation supports including:

- **Preparing Reservoirs of Alternatives**

  In part, social, cultural and economic systems maintain limitations and boundaries. These limits come to seem natural and necessary, but the space of what is possible is actually much larger.

  During periods of disruption, one of the means of recovery and reintegration is to access genuine alternatives. This requires that society creates stores of alternatives to draw on and keeps them in circulation.

  These alternatives are threatening within the normal social space because they challenge habits and the flow of resources. Alternative spaces can make them safe and can offer grounds not just for developing but also for testing alternatives so that there is a deep, rich store to draw on.

- **Creating Pathways for Innovation**

  A core means of propagation of innovations is the alignment of core actors. When innovations have the most profound impacts, they are often reinforced by individuals who come from different directions and for different reasons. Participants in Change Labs get a chance to explore and practice openness in a safe environment.

It would be interesting to experiment with whether this shapes how they respond outside the lab and whether they have other tools to asses innovations that they might otherwise have rejected a-priori. In addition to fostering a degree of general openness, the SI Change Labs are also designed to bring together particular people and foster relationships that can directly support the propagation and development of innovations.

- **Maintaining Complexity and Moving Across Scales**

  One of the core problems in social innovations is that while individuals working in systems have deep knowledge of the systems, including things that do and do not work and continually alternative approaches and solutions, those insights and alternatives rarely cross scales to drive economic or policy change and so rarely fulfill their potential. Many, many people engage directly with systems but a relatively small number of factors drive larger societal level variables. This simplification helps keep the system tractable so that a small number of leaders at the top can carry what matters about it in their heads and govern with limited knowledge, but the richness and complexity of real systems gets lost. As a result, the number of alternatives available in the dialogue is far smaller than what the society actually produces.

  Modes of governance suited to complex systems must find ways to support information to cross scales and for the richness and patterning of real systems to shape decisions and resource flows. A suite of tools for exploring and imagining systems together is necessary to begin to create corridors that let innovations cross scales. Change Labs that strategically bring people together and engage in mapping and understanding whole systems have the potential to do exactly this.

In sum, what would be unique about a social innovation lab? In addition to fostering a degree of general openness, the SI Change Labs are also designed to bring together particular people and foster relationships that can directly support the propagation and development of innovations.

1. They would be infused and guided by the social innovation model and questions, including: a cross-scale, whole system focus and an emphasis on the role of integrating vulnerable populations as well as the importance of social innovation for resilience.
2. They would use ethnographic research focused on deepening the “design brief,” but also tapping cross-scale models, that is, gathering stories and examples from the very local and specific context of innovation to the broad policy contexts which define the parameters of innovation.
3. Their experts would be a customized team of activists, innovators, policy makers, etc., who are particular to the focal problem/design brief and potential resources for parts of the emerging strategy.
4. They would use computer programming to model systems (to be developed at Waterloo), and also for strategic decisions.

Social innovation Change Labs would not work in isolation but are a natural keystone to anchor and maintain a whole ecology of social innovation supports.

References

Anon. “Snapshot.” http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html.

Berger, Warren. 2010. *Glimmer: How Design Can Transform Your World*. Vintage Canada.

Bion, Wilfred R. 1961. *Experiences in Groups: And Other Papers*. Tavistock, UK: Psychology Press.

Brown, Tim. 2009. *Change By Design: How Design Thinking Transforms Organizations and Inspires Innovation*. Harper Business.

Centre for Interactive Research on Sustainability. 2011. “Tools for Modeling, Visualization and Community Engagement.” http://cirs.ubc.ca/research/research-area/tools-modeling-visualization-and-community-engagement.

Kelley, Thomas, and Jonathan Littman. 2005. *The Ten Faces of Innovation: IDEO’s Strategies for Defeating the Devil’s Advocate and Driving Creativity Throughout Your Organization*. Crown Business.

Lewis, F.L. 1992. *Applied Optimal Control and Estimation*. Prentice-Hall. http://arri.uta.edu/acs/history.htm.

Lindenmayer, David B., Robert C. Lacy, and Matthew L. Pope. 2000. “Testing a Simulation Model for Population Viability Analysis.” *Ecological Applications* 10 (2): 580–597. doi:10.1890/1051-0761(2000)010[0580:TASMFP]2.0.CO;2.

Montagnini, Leone. 2007. “Looking for ‘Scientific’ Social Science: The Macy Conferences on Cybernetics in Bateson’s Itinerary.” *Kybernetes* 36 (7/8) (August 14): 1012–1021. doi:10.1108/03684920710777522.

National Training Laboratories Institute. “About NTL.” http://www.ntl.org/inner.asp?id=178&category=2.

Richardson, GP, and Carl Harris. 2011. “System Dynamics.” In *Encyclopedia of Operations Research and Information Science*. Kluwer Academic Publishers. http://www.systemdynamics.org/what_is_system_dynamics.html.

TED. 2006. *Hans Rosling Shows the Best Stats You’ve Ever Sees*. http://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen.html.

Wikipedia contributors. 2012a. “Chemical Process Modeling.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc. http://en.wikipedia.org/w/index.php?title=Chemical_process_modeling&oldid=477654794.

———. 2012b. “Design.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc. http://en.wikipedia.org/w/index.php?title=Design&oldid=492222607.

Woodbury, Robert. 2010. *Elements of Parametric Design*. 1st ed. Routledge.

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Appendix 1

Questions for discussion:

a. **Where do the "briefs" come from? In other words, who is the customer?**
We are proposing a model that is 50-75% funded by Foundations who then also become the customers for the services of the Change Lab. For example, a group of grantees working on food security issues could be invited to participate in a Change Lab that helps them to define system level intersections and solutions. Governments could also play a similar function.

b. **How are the briefs refined and focused?**
It is important to have excellent qualitative researchers as a lengthy up front data collection process is key to a successful Change Lab.

c. **How is the data introduced?**
Videography capacity in addition to experimentation with multiple techniques of data presentation is important. Those participating in the change lab should have as much opportunity as possible to interpret and analyze the data themselves, although the data will need to be made accessible.

d. **How are participants selected?**
It is important that, as much as possible, the participants should be defined by pre-existing ties, either to the funding agency or to an organization. Success of such Change Labs often hangs on a sense of accountability to an external authority/funder or to a reciprocal community.

e. **One or more processes?**
It seems that there are at least two types of Change Labs consistent with social innovation approaches. The first would address system dynamics in order to locate key leverage points or opportunities where the insertion of a specific innovation (product or process) would tip the system. The second would be an effort to use the opportunity of bringing system participants interested in innovation into the room and, through redefining the participants' relationships to each other, "bump" the system forward toward innovative alternatives. There may well be other, specialized uses of the social innovation lab space including a "mind lab" type design specific to policy concerns.

f. **Which kinds of visualizations/simulations would be most useful?**
   i. Narrative analyses – "Sensemaker"
   ii. Whole system representations (CAMS etc.)
   iii. Simulations for playing with leverage points and alternatives
   iv. Analytic tools for role out strategy?

g. **Place Based?**
The logic for a place based social innovation change lab is linked to the notion of creating an island to remove people from their daily preoccupations and roles and also to provide a facility where creativity is supported by appropriate physical layout and tools/props. However, once the appropriate "software" is designed, there is no reason why the processes could not be replicated in other lab-like settings, with appropriate adjustments to local culture, etc.

h. **Role out: Action planning**
Plans for this still need to be developed, but, as indicated above, it needs to be based on a good accountability system and involve commitments of the participants themselves.

Appendix 2

Technology to support a social innovation lab process:

We propose putting together a new computer based program that can allow groups, with the help of a facilitator, to analyze complex and problematic systems. The simulation would allow groups to:

a) distinguish the components making up the system (institutions, organizations, individuals, policies, activities, cultural characteristics, economic forces etc.)
b) determine the relationship between these (positive and negative feedback loops, direct and indirect relationships)
c) determine the leverage points where changing key relationships is both possible and would result in a cascading impact on the problem domain
d) identify the pockets of novelty/innovation or shadow attractors that could be strengthened to take advantage of any cascade of change

This program would create a system map that could be used in a variety of different ways by different stakeholders.

a) Academics would be key in bringing existing knowledge and research to bear on identifying areas of certainty and uncertainty in system relationships.
b) Innovators and institutional entrepreneurs could use the platform as a change tool to determine where and when to act. Simulations could allow them to play with alternatives.
c) Policy makers could identify the key political arenas in which they could make a difference
d) Funders could use the map to identify where funding already was in place and where their grants could make a difference.

The process would be iterative:

Step 1:

1. A review of literature (published and grey) would establish who had the best expertise in the area.
2. A process would be designed to bring together experts from around the world who have the best knowledge of the field. The literature review would serve as background for our best guess conceptual map.
3. In a process designed to level power between disciplines, to allow for the recognition of uncertainty and to mediate conflict, experts would work to create a map based on the knowledge of the system. Relationships between variables in the system could be coded according to certainty and uncertainty and type of data available (qualitative and quantitative etc.).
4. The process design would surface both the dominant systems and the “shadow” or alternative systems (generally linked to innovation).
5. The resulting map (called first generation map) would summarize the state of expert and academic knowledge.

Step 2:

1. This map would need then to be translated into maps that communicated to policy makers, funders or social innovators.
2. In the process of using the second generation map a simulation could also be created that would allow participants in the change lab to test solutions.
3. New data could also be added that could be translated back to the first generation map.
4. Ideally, the maps could continue to be moulded for different uses.
5. A “layering” or connectivity between maps would allow people to explore the interactions between systems as viewed by academics, policy makers, funders etc.

This tool needs considerable development. Its goal is to provide a way to integrate the best academic knowledge available concerning a problem domain, to make that available to decision makers and to provide a plastic model that could capture multiple perspectives and could be used to do sensitivity analyses for policy, funding or change options.