Co-Design Problem Solving Methods

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Overview

Co-Design is an approach to problem solving that promotes new choices (rather than leaping to familiar answers), supports free thinking (rather than thinking in silos) and ultimately aims to help communicate prototype solutions to get feedback for rapid innovation (i.e. learn fast, fail safely – see Fig.1). Drawing on industrial and architectural design practice, co-design is hands on and collaborative, encourages creativity and the integration of knowledge from diverse experience. It is particularly useful for problem solving for climate change and development because it is a neutral method by sector or discipline when climate problems typically need inputs from divergent sectors and evidence bases. One of the softer outcomes of using co-design is that it's playful use of physical modelling, visual diagrams and peer feedback builds trust and confidence between participants who may typically bring lots of doubts and questions about how to move forward together on the complex and emergent challenges that climate change and development present.
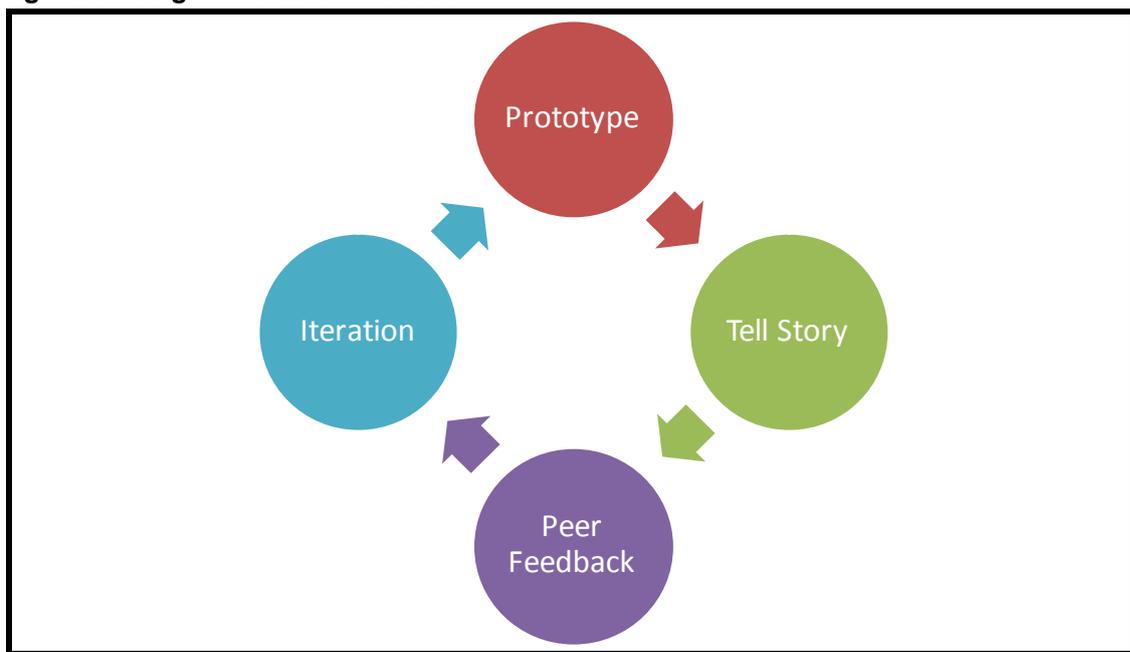
In this paper you'll find four complimentary co-design methods:
1. Physical Models
2. Diagrams
3. Storyboards
4. Rolling Peer Assist

The first three methods are alternative ways to generate new choices and support free-thinking. The fourth method is a more extensive way to communicate prototype solutions for feedback.

Fig.1 Co-Design Innovation Process

Co-Design with Physical Models

A physical model of a solution (e.g. a policy, service or tool) makes a written idea come alive. Using rough materials (card, tape, straws, polystyrene shapes) allows you to quickly mock up prototype solutions and share them with colleagues and users for feedback.

A model can easily represent a policy process in three dimensions (e.g. exploring different combinations and sequences of the stakeholders, resources, activities involved in an assessment, capacity building or decision making event). Perhaps the size of elements in your model will relate to relative power or the space between elements of your model will relate to communication gaps that need to be bridged?

Process Tips
To run a three hour Co-Design with Physical Models process try adapting these straightforward tips to your needs:

Preparation
Four weeks before the day draw up a list of potential participants and one or two critical friends and announce the Co-Design session. The critical friends can help to challenge and nudge along thinking during the co-design process.

Two weeks before the day of the session invite participants to send you the title of a real world problem or opportunity they would like to work on with others. Compile suggestions, indentifying any related ones so you have a list participants can prioritize and select from on the day.

In the week before the session you will need to get hold of modelling materials such as cardboard, felt pens, bendable straws or wire, polystyrene foam shapes, sticky labels, sticky tape, coloured paper etc. It is also useful to have a digital camera to photograph the model and a flip chart to record feedback.

Example Annotated Agenda

30 Minutes
1. Introduction of the Co-Design with Physical Models approach (including showing how the modelling materials could be used)
2. Sharing of the compilation of problems / opportunities and facilitation of participants' prioritisation and selection of what they will work on

15 Minutes
3. If you have more than 5 participants form groups of 3-5 people around one of the selected problems / opportunities (groups working on different things works best)
4. Participants collect modelling materials from the resource table for their group

45 Minutes
5. Before you begin to brainstorm on solutions come up with a visionary title for your solution to serve as a boundary within which to think freely

6. Drawing on experience from beyond your sector/discipline/area, brainstorm to produce divergent insights that create new choices to make regarding your vision of a solution (rather than converging on a solution too quickly). To initiate the brainstorm try asking the question 'What desires, actions, or drivers lay beneath this problem?'
7. Cluster the insights under a title that completes the sentence "To address this problem / opportunity we could choose to XXXXXX..."

60 Minutes
8. Create a tangible representation of the solution by quickly building a physical model. Neatness, faithful representation and artistic flair are not needed. Grab some materials and begin to model ideas that could represent a tool or structure that responds to those new choices (e.g. the ideal components and qualities needed for a document, an organisation or collaboration of actors). Talk about your initial model with each other and adapt / reconstruct it. Maybe one element of the model shows how familiar elements are brought together in a novel arrangement or how a catalytic force radically changes the quality of a traditional component. Use shapes and labels to communicate important features of your prototype solution.
9. Respond to challenges from the critical friends or challenge them to apply their experience to speed the prototyping

30 Minutes
10. Each group uses the model of their prototype solution to tell stories about their idea to get feedback from their peers that will help in future iterations. The organiser of the session should actively moderate this session so that as many opinions as possible are heard. Each group needs fifteen minutes so if you have more than two groups this part of the process needs to be longer.
11. Capture feedback on a flip chart and photograph to share with each group following the session.

Further Information
The Co-Design method is adapted from the Human Centred Design Toolkit (2009), IDEO

Download the HCD Toolkit here you just need to register:
http://www.ideo.com/work/human-centered-design-toolkit/

Also by one of the IDEO founders, Tim Brown's book Change by Design:
http://www.ideo.com/by-ideo/change-by-design?cbd

One of the instances where IDEO have used this HCD process is in collaboration with Acumen Fund and the Bill and Melinda Gates Foundation on drinking water innovation in India and Kenya. See the Ripple Effect project site:
http://rippleeffectglobal.com
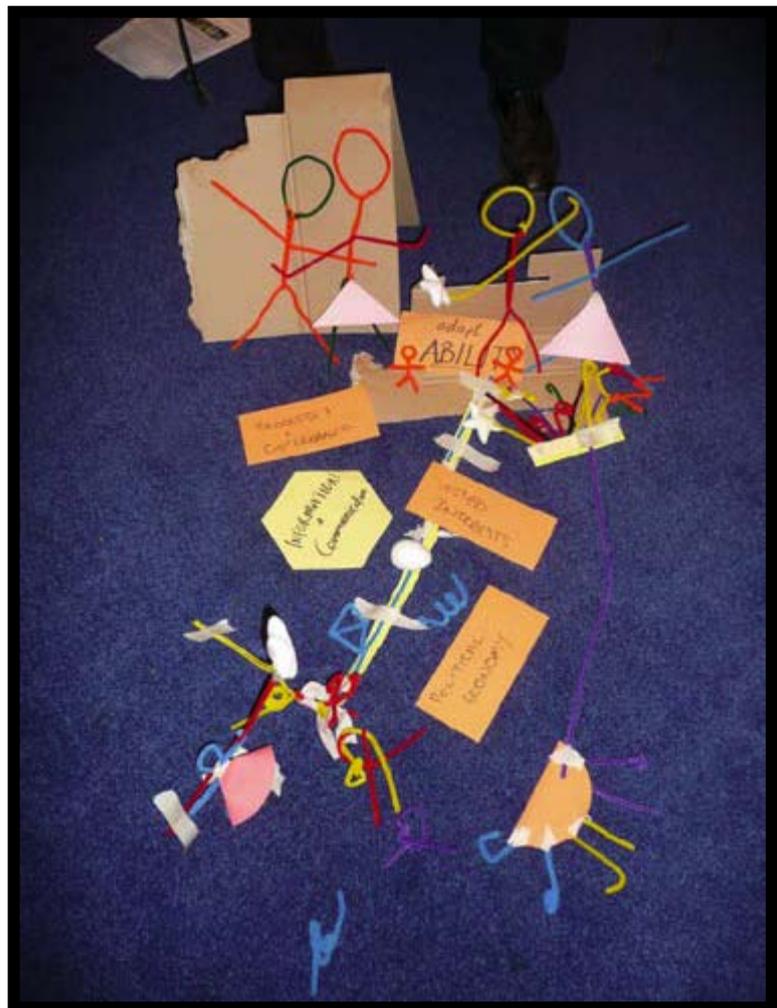
Co-Design with Diagrams

This version of co-design with diagrams is the Hadron Problem Collider[1]. Rather like the particle accelerator at CERN[2] it collide parts of a problem together to help create new and unexpected building blocks for a solution.

The Hadron Problem Collider a great way to collaborate in exploring the assumptions and related ideas to a problem or opportunity. By breaking the problem into its component parts and then systematically exploring associations and ideas that come from colliding each part with all others new insights emerge that better reflect the knowledge of the whole group and are less bound by conventional thinking.

Process Tips
To run a two and three-quarter hour Co-Design with Visual Thinking process try adapting these straightforward tips to your needs:

Preparation
Four weeks before the day draw up a list of potential participants and one or two critical friends and announce the Co-Design session. The critical friends can help to challenge and nudge along thinking during the co-design process.

Two weeks before the day of the session invite participants to send you the title of a real world problem or opportunity they would like to work on with others. Compile suggestions, indentifying any related ones so you have a list participants can prioritize and select from on the day.

In the week before the session you will need to get hold of drawing materials such as large sheets of paper, felt pens, sticky labels, sticky tape, etc. It is also useful to have a digital camera to photograph the diagram and a flip chart to record feedback.

Example Annotated Agenda

30 Minutes
1. Introduction of the Co-Design with Visual Thinking approach (including showing how the drawing materials could be used)
2. Sharing of the compilation of problems / opportunities and facilitation of participants' prioritisation and selection of what they will work on

15 Minutes
3. If you have more than 5 participants form groups of 3-5 people around one of the selected problems / opportunities (groups working on different things works best)
4. Participants collect drawing materials from the resource table for their group

60 Minutes

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[1] Adapted from the 'Hadron Joke Collider', pg.65-77, The Serious Guide to Joke Writing, Sally Holloway (2010)
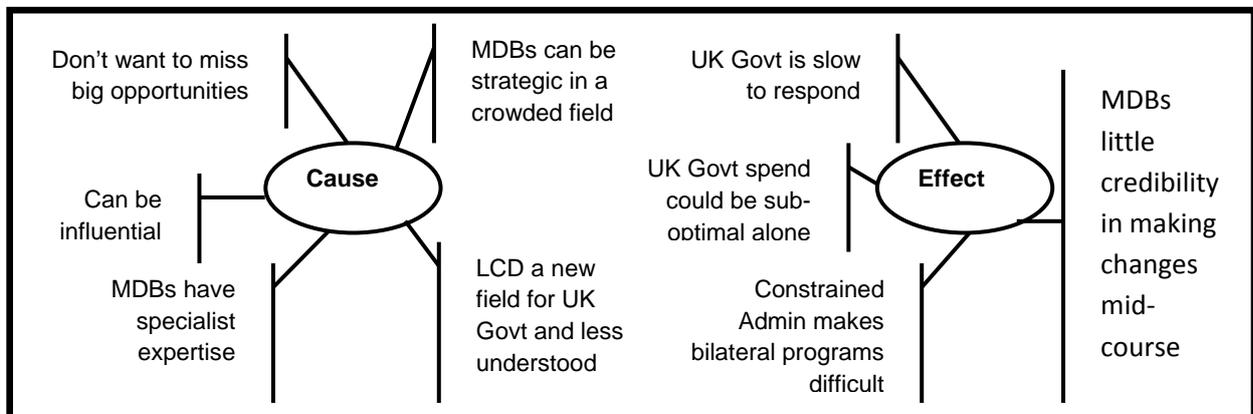[2] The Hadron Collider is the physics program that smashes atoms together at very high speed to create rare and new particles.

5. Divide the problem or opportunity into two parts – a significant cause and a significant effect and reduce them down to two short phrases.
6. Draw two circles equally spaced on a very large piece of paper (e.g. four flip chart pages taped together) and write one phrase in each. On branches radiating out of the first circle write words that you associate with that phrase (five or six sub-subjects will do). Cover up that half of the flip chart and do the same with the second circle and phrase.
7. Reveal both circles and their associations. On a new flip chart list any ideas that come to mind when you apply in turn one word from the right hand circle to the phrase at the centre of the second circle. Do this for all the words on the right and then reverse the process apply words from the left-hand to phrase on the right.
8. Review your list and circle related or stand out ideas. Expand or synthesise these to make them more concrete, reflecting on the principles and instruments / approaches developed in the workshop.
9. Respond to challenges from the critical friends or challenge them to apply their experience to speed the prototyping
10. Write a statement as a flip chart poster that incorporates the best idea as a prototype product or service that's a solution to your problem.

30 Minutes
11. Each group uses their poster of their prototype solution and Hadron Problem Collider diagram to tell stories about their idea to get feedback from their peers that will help in future iterations. The organiser of the session should actively moderate this session so that as many opinions as possible are heard. Each group needs fifteen minutes so if you have more than two groups this part of the process needs to be longer.
12. Capture feedback on a flip chart and photograph to share with each group following the session.

Hadron Problem Collider on 'How and why to work with multilateral development banks on low carbon development?'

Don't want to miss big opportunities

MDBs can be strategic in a crowded field

UK Govt is slow to respond

MDBs little credibility in making changes mid-course

Can be influential

Cause

UK Govt spend could be sub-optimal alone

Effect

MDBs have specialist expertise

LCD a new field for UK Govt and less understood

Constrained Admin makes bilateral programs difficult

Further Information
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Co-Design with Storyboards[3]

A narrative storyboard imagining the complete experience of a stakeholder or user through a series of rough sketches (e.g. stick figures and speech bubbles) helps to explore perspectives, sequences and time-scales.
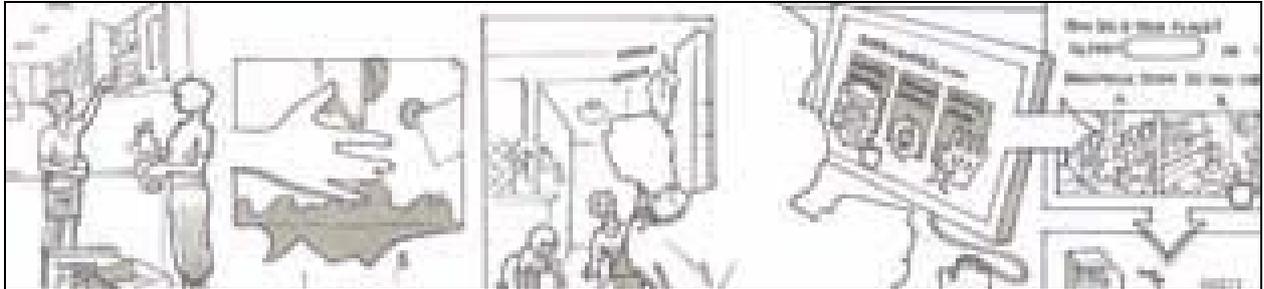
A storyboard can walk through how a stakeholder or user would ideally respond to an intervention (e.g. what their initial assumptions and needs are, what happens as they encounter different people and resources and how their behaviour or abilities change in the end). On review, perhaps there are tensions or possibilities in the narrative that additional scenes in the storyboard can help resolve.

A storyboard can illustrate how a sequence of interactions and discussions between idealised actors can move toward a desired outcome (e.g. how a new kind of organisation or mechanism enables traditional actors to come together in unexpected ways). Maybe by exaggerating reactions or attitudes in the story it will be easier to see where a new middle ground could lay.

Process Tips
To run a three hour Co-Design with Storyboards process try adapting these straightforward tips to your needs:

Preparation
Four weeks before the day draw up a list of potential participants and one or two critical friends and announce the Co-Design session. The critical friends can help to challenge and nudge along thinking during the co-design process.

Two weeks before the day of the session invite participants to send you the title of a real world problem or opportunity they would like to work on with others. Compile suggestions, indentifying any related ones so you have a list participants can prioritize and select from on the day.

In the week before the session you will need to get hold of drawing materials such as large sheets of paper, felt pens, sticky labels, sticky tape, etc. It is also useful to have a digital camera to photograph the storyboard and a flip chart to record feedback.

Example Annotated Agenda

30 Minutes
13. Introduce the Co-Design with Storyboards (including showing how the drawing materials could be used)
14. Share the compilation of problems / opportunities and facilitate participants' prioritisation and selection of what they will work on

15 Minutes
15. If you have more than 5 participants form groups of 3-5 people around one of the selected problems / opportunities (groups working on different things works best)

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[3] Adapted from the Human Centred Design Toolkit, (2009), www.ideo.com

16. Participants collect drawing materials from the resource table for their group

45 Minutes
1. Before you begin to brainstorm, each group should come up with a visionary title for their solution to serve as a boundary within which to think freely
2. Drawing experience from beyond your sector/discipline/area, brainstorm to produce divergent insights that create new choices to make regarding the proposed solution (rather than converging on a solution too quickly). To initiate the brainstorm try asking the question 'What desires, actions, or drivers lay beneath this problem?'
12. Cluster the insights under a few titles that complete the sentence "To address this problem / opportunity we could choose to XXXXXX..."

60 Minutes
3. Next draw the outline of the story board (e.g. a six by three grid of empty cells about portrait A4 size each) and roughly sketch out the beginning and end scenes in a story that describes how your solution works. Use stick figures and other simple images.
4. Then flesh out connecting steps in the narratives (e.g. that show how different stakeholders and organisations behaviours, capacities, relationships and roles change). If one step looks wrong, tape a blank sheet of paper over and recreate the scene. Add labels or speech bubbles to emphasise key actors, behaviours or outcomes in scenes
13. Respond to challenges from the critical friends or challenge them to apply their experience to speed the prototyping.
5. Finalise your storyboard narrating a tangible idea of the solution to your problem.

30 Minutes
17. Use the storyboard of the prototype solution share your ideas to get feedback from your peers that will help with further iterations of the idea. The organiser of the session should actively moderate this session so that as many opinions as possible are heard. Each group needs fifteen minutes so if you have more than two groups this part of the process needs to be longer.
18. Capture feedback on a flip chart and photograph to share with each group following the session.

Further Information
The Co-Design method is adapted from the Human Centred Design Toolkit (2009), IDEO

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Rolling Peer Assist

Rolling Peer Assist is a powerful approach to calling in advice and support from your network to help solve tricky problems we face at work. It essentially involves inviting a group of people you trust to hear what you know about a problem or issue you are facing and asking them to share what they know about similar situations from their context. It can also serve as a more extensive way to communicate prototype solutions for feedback from co-design using Physical Models and Visual Diagrams.

Rolling peer assists are particularly good for accelerating learning because sharing the same problem sequentially with different groups of peers promotes reflection and iterative thinking. Each time the problem is shared it becomes better defined and each time advice is received it builds upon what was previously heard.

Process Tips

To run a three and half hour Rolling Peer Assist process for three problems try adapting these straightforward tips to your needs:

Preparation
Four weeks before the day draw up a list of potential peers (e.g. invite 40 to secure 15 attendees) you would like to join you, trying to include a mix of technical skills and experience. You will also need one person per group to act as the facilitator for the Rolling Peer Assists.

One week before the day of the session share a brief description of what you already know about your problem and what advice and support you would ideally like to receive with your facilitator for feedback. Refine your presentation so it is clear and lasts no more than ten minutes. You will also need to get hold of a flip chart to record feedback.

Example Annotated Agenda

15 Minutes
Step A. Have a brief round of introductions, explain the Rolling Peer Group Process and invite peers to form into three mixed background / experience groups.

10 Minutes
Step B. In each group, those seeking input set out what they know about their problem or issue and what ideally they would like to get out of feedback.

15 Minutes

Step C. In each group hold an initial round of clarifications with the peer group to clear up any misunderstandings from your presentation.

30 Minutes
Step D. In each group the facilitator then invites peers to take it in turn to share experience they have that may relate to this problem / issue. Remind peers to be positive and constructive if they directly offer advice. If you are the one receiving comments don't be defensive – it's all useful. The facilitator helps to ensure the discussion remains constructive on all sides and takes notes on the flip chart. Peers then go to another group and the process is repeated until each group has heard and feedback on each problem.

Two More 55 Minute Rounds Step B to D
Repeat steps B to D twice. Groups move between problems, while the facilitators and those seeking input stay still.

30 Minutes
Following all the rounds the seekers report back in plenary to all peers on what they have learnt and are taking away to act on from the advice and support received.

Further Information
The Knowledge Sharing Toolkit (CGIAR) article on Peer Assist (non-rolling type):
http://www.kstoolkit.org/Peer+Assists

Common Knowledge Associates Peer Assist Guidelines (non-rolling type):
http://www.commonknowledge.org/userimages/resources_peer_assist_guidellines+.pdf

Learning to Fly (2004), Chris Collison and Geoff Parcel, Chapter 7 'Learning from your Peers', Wiley-Capstone Publishing, Chichester