

Systems Mapping Facilitation Manual
Arqus Winter School
Bergen, February 2021

(2hr session)

Acknowledgements: This manual was developed by the core modeling team of Birgit Kopainsky, Anaely Aguiar, Christina Gkini, Brooke Wilkerson and Lars-Kristian Trellevik from the Online System Dynamics Collaborative at the University of Bergen (UiB), Norway.

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Workshop: Systems mapping of the processes combining in 'creating climate risks'

Table of Facilitation Team Members and Roles

Roles	Session 1
Opener/Closer	Birgit Kopainsky
Facilitators	Birgit Kopainsky, Anaely Aguiar, Christina Gkini, Brooke Wilkerson, Lars-Kristian Trellevik, Scott Bremer, Jakob Grandin
Modelers	Winter school volunteers
Presenter (model presentation)	Modelers

Session Agenda: 120 minutes

Activity	Description	Time
1. Miro workspace/ Zoom setup	The modelling team prepares the workspace and initial Zoom call.	-15 min
2. Welcome, Introductions, Plan of the day	The project leader welcomes participants and opens the meeting. Introduction of the modelling team, and a brief introduction to the activities that will be completed along the workshop.	5 min
3. Introduction to ST/SD - Group formation	Systems Thinking and System Dynamics are introduced by one member of the modelling team who then instructs participants to form groups and directs them to their respective workspaces in Miro.	15 min
4. Problem articulation	Brief introduction of each group's problem variable to be addressed during the workshop.	5 min
5. Variable Elicitation	Participants identify key factors around our problem and their development over time.	15 min
6. Causal Mapping/ Connecting factors	The facilitator and modeler help participants find the connections between different concepts or variables that contribute to or are affected by the problem variable.	20 min
7. Break		45 min
8. Causal Mapping/ Feedback loop identification	The facilitator gives a brief outline of how the map was updated during lunch break. The facilitator also checks and confirms the map together with participants in case there is something that needs to be added, removed or changed. The facilitator and modeler help participants identify feedback stories in the map.	40 min
9. Leverage points	Participants identify possible entry points on the map for actions that can alleviate the problem.	10 min
10. Next Steps and Closing	The facilitator thanks participants for their time, informs them of how their contributions will be carried forward, and invites them to stay to fill in the online workshop evaluation form.	10 min

Scripts

Group model building sessions typically consist of a sequence of small group activities or “scripts”.¹ These scripts describe the essential components of an exercise along with the inputs from other exercises needed to do the script and the outputs produced from the script. Additional information about scripts can be found in the latest version of *Scriptapedia*, available on <https://en.wikibooks.org/wiki/Scriptapedia>

¹ Andersen, D. F., & Richardson, G. P. (1997). Scripts for group model building. *System Dynamics Review*, 13(2), 107-129.

Hovmand, P. S., Andersen, D. F., Rouwette, E., Richardson, G. P., Rux, K., & Calhoun, A. (2012). Group model building "scripts" as a collaborative tool. *Systems Research and Behavioral Science*, 29, 179-193.

Facilitation Manual

TIME	ACTIVITY	ZOOM SCREEN	MIRO SCREEN	SCRIPT
11.30 – 11.50	Welcome, introduction, plan for the day, group formation	Zoom with shared screen		<ol style="list-style-type: none"> The opener announces the start of the session. <ul style="list-style-type: none"> → Welcome the participants and thank them for attending. → Briefly explains the background of this workshop, and the purpose for bringing the participants into the session. The opener begins the introductions: <ul style="list-style-type: none"> → Introduce yourself, and then introduce the other members of the facilitation team. The opener introduces ST & SD. The opener then describes the plan for the modeling session, when breaks will be, and asks if all participants are ready to begin. Group formation: <ul style="list-style-type: none"> → The opener assigns the groups with respective facilitators and modelers and arrange break-out rooms in Zoom. → Participants move to their break-out rooms where the facilitator will start with the mapping session. → Facilitators run the entire session from their Zoom shared screen and modelers work directly on the Miro board.
11.50 – 11.55	Problem articulation	Zoom with facilitator's shared screen	Graph over time on the top of the board	<ol style="list-style-type: none"> The facilitator probes for the problematic behavior related to climate risks that will be the focus of the session. The facilitator introduces the problematic variable with a graph over time as a way to visually describe a problem's behavior, beginning with the

12.10 – 12.30	Systems mapping (connecting variables)	Zoom with facilitator's shared screen	CLD area (collective)	<ol style="list-style-type: none"> 1. The facilitator introduces the variable connection script like this: <i>“The goal of a variable connection exercise is to find the connections between different concepts or variables that contribute to or are affected by some issue—in this case [Insert problem variable].</i> <i>We can start by taking one of the factors you created in the first exercise. Can someone identify a factor that can share a relationship with the problem variable? It can be a cause of the problem variable or a consequence”</i> 2. The modeler moves the variable to the CLD area. 3. The facilitator clarifies from the participants the nature of the relationship between the factors (black arrows, change in the same direction OR , red arrow, change in opposite directions), and then the modeler draws the appropriate connection in the Miro board (red for negative, black for positive) 4. The modeler draws the links the facilitator is describing, and Miro board is on the main screen for everyone to see. 5. The facilitator continues to ask for connections, focusing on extending the story captured in the first connection. <ol style="list-style-type: none"> a. <i>“We have just made a connection between A and B – what else do we know about this story – is there anything that contributes to A, or can we think of anything that changes because of B?”</i>

				<p>b. Once participants have run out of connections for the beginning story, or if a particularly meaningful story moves the discussion onto another pair of factors, but return to the prompt above in point a.</p> <p>-> During this process, the modeler is free to ask questions to clarify the relationships between the variables.</p> <p>5. Once most of the factors around the diagram have at least one connection (if there are 1-2 factors that still need to be connected, draw participants' attention to that factor and ask them to make the connection).</p>
12.30 – 13.15	Lunch			<p>The modeling team cleans up and revises the diagram.</p> <p>Clarifications can be available during lunch break for participants that request it.</p>
13.15 – 13.55	Systems mapping/ feedback loop identification	Zoom with facilitator's shared screen	CLD area	<p>1. The facilitator tells participants that the map created before lunch has been revised – taking care to remind participants that we have not discarded their ideas, but have visually cleaned up the map, and made adjustments. Then the facilitator asks whether there are more variables or connections missing and the modeler adds them accordingly.</p> <p>2. The facilitator continues with the diagram trying to identify at least one feedback loop and says:</p> <p><i>"We will now try to identify feedback stories in this diagram (loops), which will make it easier to read and understand this diagram."</i></p> <p>3. The modeler then arranges the diagram according to what participants say about potential loops. If the picture is very tangled and requires more effort</p>

				<p>to clarify, a few minutes can be allowed to think about the possible feedback stories.</p> <p>4. The facilitator asks for additional connections people can see in this diagram. In particular, the facilitator emphasizes feedback loops, encouraging participants to extend on existing stories, and close feedback loops if possible, rather than add connections more generally.</p> <p>5. The facilitator asks if the participants have any comments or reflections on the diagram.</p>
13.55 – 14.05	Leverage points identification	Zoom with facilitator's shared screen	CLD area	<p>1. The facilitator continues with identifying leverage points or policy entry points to alleviate the problem, by saying:</p> <p><i>“What we are now going to focus on is in identifying entry points for interventions: Where do you think action is needed to improve the problem we’re discussing today?”</i> – state the problem</p> <p>2. <i>“Look at loops/traps/cycles and we will try to intervene in these areas.”</i> [describe one – show how it becomes a ‘trap’ which are often loops]</p> <p>3. <i>“Let’s look again at the map together, think about 3 factors or areas that you think are the most important places where we could act to improve the problem”.</i> Let them shout.</p> <p>4. The modeler places polka dots in different colors next to the entry points indicated by participants, this way is clearer where we want to break the cycle.</p> <p>→ The facilitator briefly prepares the modeler to give the map presentation for the plenum.</p>

...14.15 ENDS...	Closing			The <i>facilitator</i> thanks participants for their time, informs them of how their contributions will be carried forward, and invites them to stay to fill in the online workshop evaluation form.