

A six-point modeling checklist

A causal loop diagram models of the cause-and-effect relationships between several variables. It is used to **explain the behaviour of a key variable** over a given period and to help **find leverage points for impactful action**. Here is a checklist to evaluate the quality of your model.

1. Does your model explain the behaviour of the key variable?

Your model should **explain the behaviour of the key variable** over time as described in your problem statement [phase 2]. You should start by checking that **the key variable is indeed in your model**.

Depending on the type of behaviour, one (or more) structures should be present in your model: if the behaviour is one of **parabolic growth** or **decay**, there should be at least one **reinforcing feedback** loop; if the behaviour is one of **asymptotic growth** or **decline**, there should be at least one **balancing feedback** loop; if there has been an **unexpected slowdown** in the key variable **after a period of growth**, there should be at least two loops: a reinforcing loop that is dominant during the growth phase, and a balancing loop that dominates during the slowdown. Other, more complex scenarios may be found in system archetypes.

2. Have you found any feedback loops?

Feedback loops influence the dynamics at work in a system. The **type of loop** depends on the polarities: an **even number** of “-” polarities (or none) has an amplifying effect; an odd number of “-” polarities has a regulating effect. **Name your loops** according to their role in the system (e.g., “word of mouth commercial growth loop”). **Sometimes loops are hidden**: to reveal a loop, start from a variable and identify all the paths that allow you to return that same variable. Each path corresponds to a loop.

3. Are all polarities correct?

Positive (+) polarities reflect a change in the same direction, *all other things being equal*. **Negative (-) polarities** reflect a change in the opposite direction, *all other things being equal*.

4. Are there delays or threshold effects (or “tipping points”)?

Delays and threshold effects influence relationships between variables. To find threshold effects, we **look for accumulations** (i.e., stocks) in the model. You can **use a symbol** to represent these phenomena. For example, a rectangle for an accumulation.

5. Can your model help you find leverage points for action?

Your model should be precise enough to make it easy to identify systemic leverage points. These are most often **“cause” variables that can be acted upon**. Can **causes be added** to your model? Can **causal chains expanded** or **aggregated variables ungrouped** to facilitate the identification of leverage points? Have you identified all the **rates** (e.g., adoption rate, usage rate, tax rate, growth rate), **ratios** and **parameters** that could be adjusted in your model? Are all **the constraints, limits, or objectives** (implicit or explicit) visible in balancing loops?

6. Is your model readable, parsimonious and efficient?

Do all the variables in your model **contribute to the story**? If there are variables without causes or effects, are they **useful** in the model? Do the names of the variables allow them to be seen evolving over time? Does the **layout** of the model (color, grouping of variables, titles, etc.) make it easy to read?