How to Draw a Systems Diagram

Step-by-Step Instructions for a Simple Example
Basic Steps to Follow:

1. Identify components of system:
   - Things
   - Events
   - Measured Value/Data

2. Characterize the behavior of the system components:
   - Are they static?
   - How do they change with time? Sketch graphs!

3. Identify linkages and connections between components.

4. Draw the linkages between system components, indicating feedback loops.

5. As you draw components and connections on the diagram, make sure that you have included all of the relevant components.
   - Add new components and connections as needed.
   - Pay attention to the level of detail you are including – is a component or connection too specific for the diagram you are making?
A Simple Example: Heating a Room
Step 1: Identify Components of the System

• Components:
  – Heater with on/off switch
  – Room
  – Thermostat (optional)

• Events:
  – Turning on/off the heater

• Measured Value:
  – Temperature of the room
Step 2: Characterize the Behavior of the System Components:

• Components:
  – Heater with on/off switch
  – Room
  – Thermostat

• Events:
  – Turning on/off the heater

• Measured Value:
  – Temperature of the room
Steps 3 & 4: Identify and Draw Linkages Between Components (Without Thermostat):

1. Enter Room
2. Heater Switch On
3. Warmed Room

Temperature vs. Time Graph:
- High Temperature
- Low Temperature
Steps 3 & 4: Identify and Draw Linkages Between Components (With Thermostat):

Enter Room → Heater Switch On → Thermostat

- **Warmed Room**
- **Measure Temperature**

- **T > set point, turn off**
- **T < set point, turn on**

![Temperature Time Graph](image)
Step 5: Consider Where Additional Detail Could Be Added:

- **Enter Room**: The biological/physiological mechanisms for a person entering a room and sensing the temperature.
- **Heater Switch On**: How the heater works (i.e. switch on, current passed through element, fan blows air into room or switch on, burner fired to heat water, water circulated through pipes).
- **Warmed Room**
  - Flows of heated and cold air into/out of the room.
  - T > set point, turn off
  - T < set point, turn on
- **Thermostat**
  - How the thermometer works.
  - How the thermostat works.
- **Measure Temperature**: How the thermometer works.
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