# Photo Elicitation for Exploring Complex Systems

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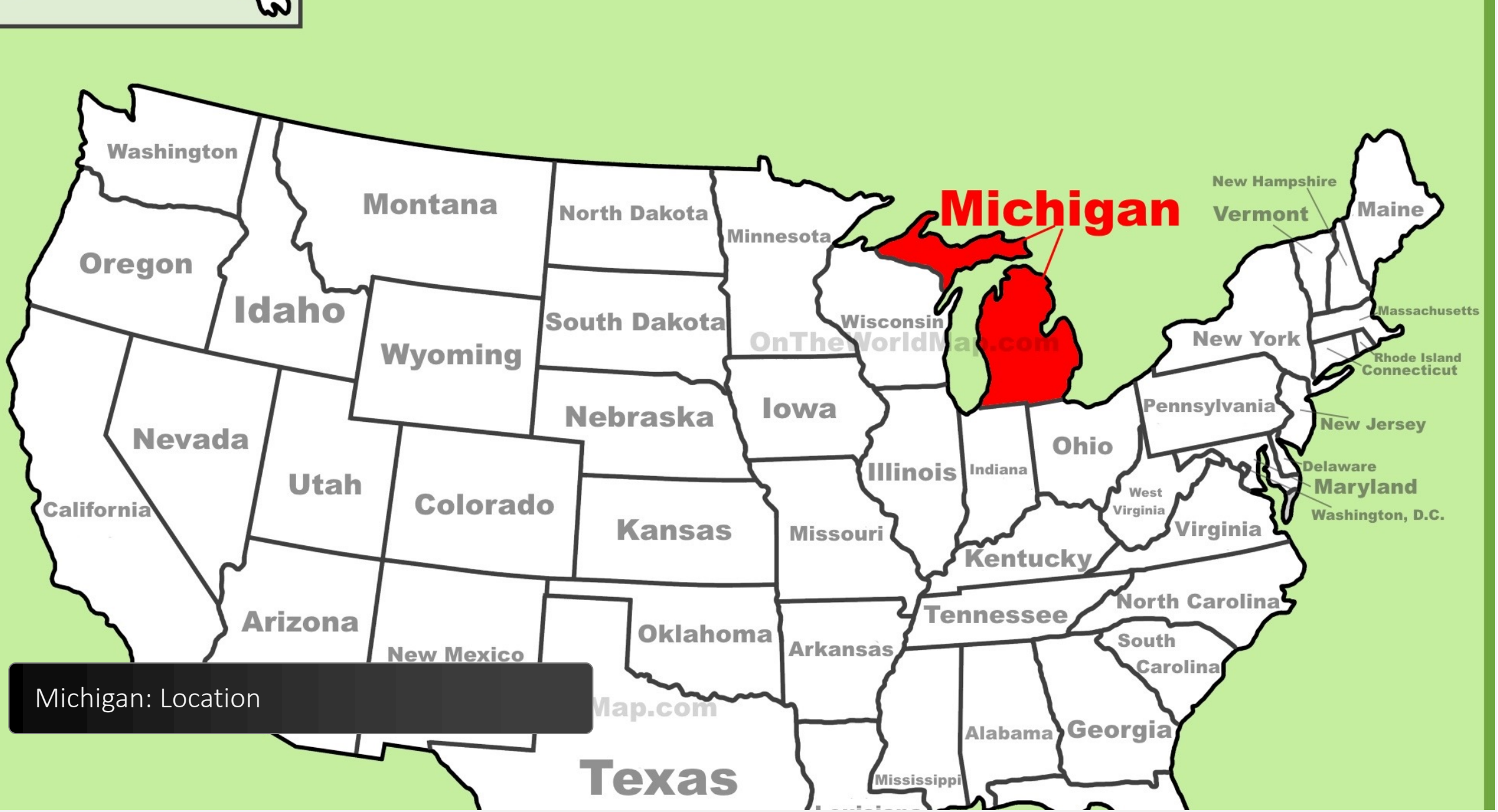



Michigan: Location

# Videos

- Combines immersive videos to show scale & infrastructure with interviews
- Covers all generation technologies
- Introduction: https://youtu.be/GMkXTGZdP3c
- Wind clip: https://youtu.be/MTG0iStKOGU (2:33)

# If you want to dive into 360 video

Here's the gear we use

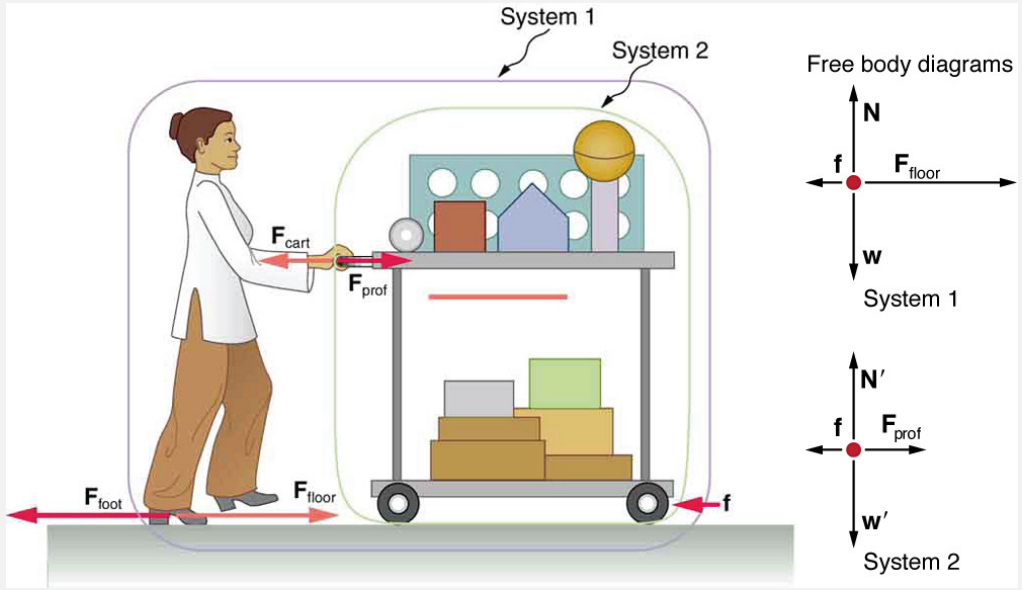
- 360 Camera
  - GoPro Max 360 ($400), waterproof or
  - Insta360 ONE X2 ($415)
  - Plus accessories
- An external SSD that's a big as you can afford. These files are GIGANTIC. You'll need at least a terabyte or two…
- Video Editing Software
  - We use Adobe Premiere Pro and After Effects, which are neither cheap nor particularly user friendly
  - To add drone footage
  - Check out the DJI Mavic Air 2 (~$1,000)



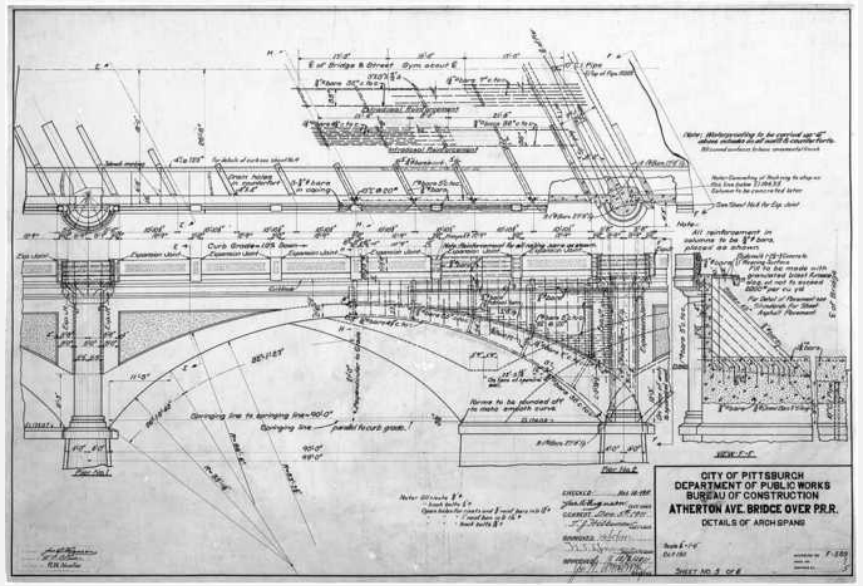




# Let’s chat systems



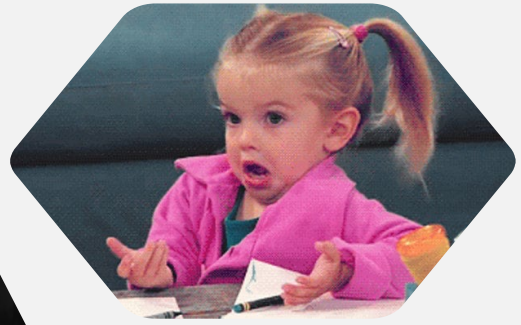


# What do we mean by systems?

*For every complex question there is a simple answer, and it is wrong.*

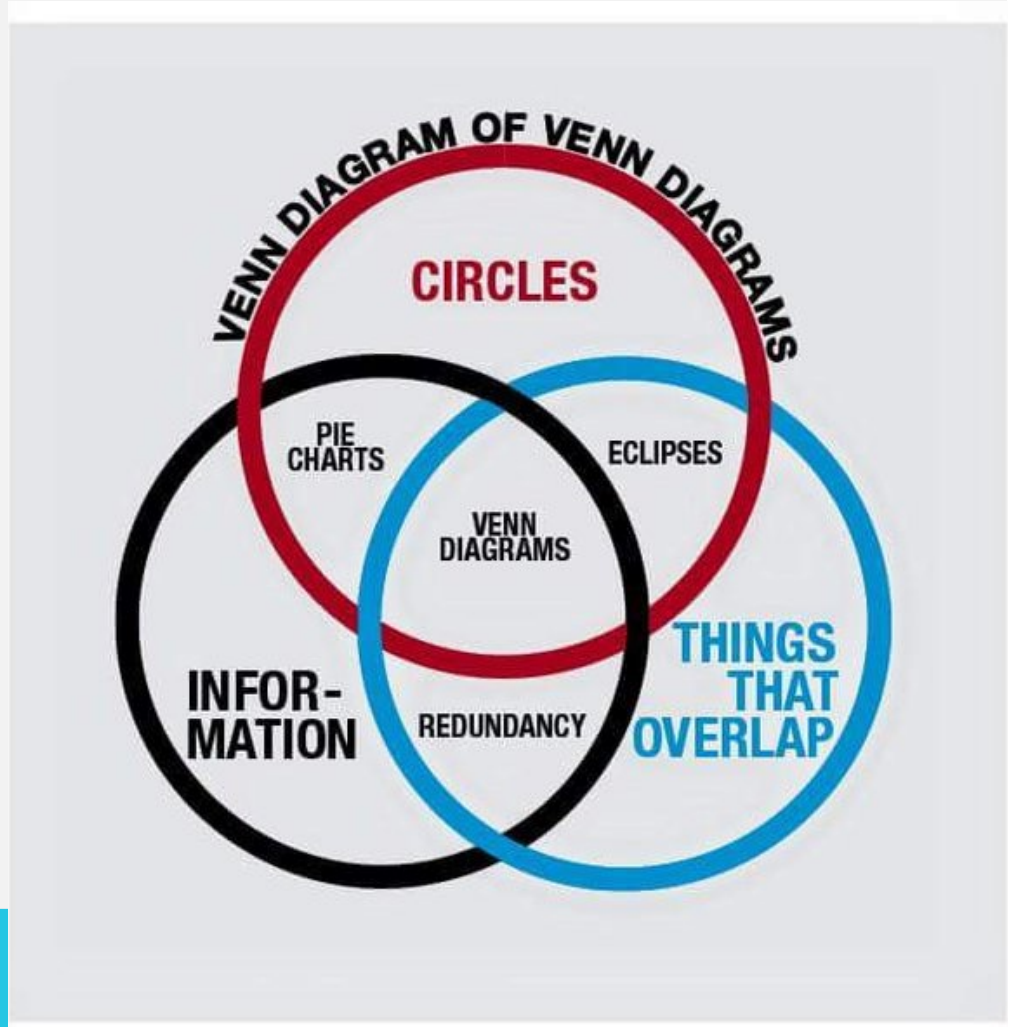
*- H.L. Mencken*




# Systems are defined by their boundaries

And those boundaries are defined by the person describing the system…

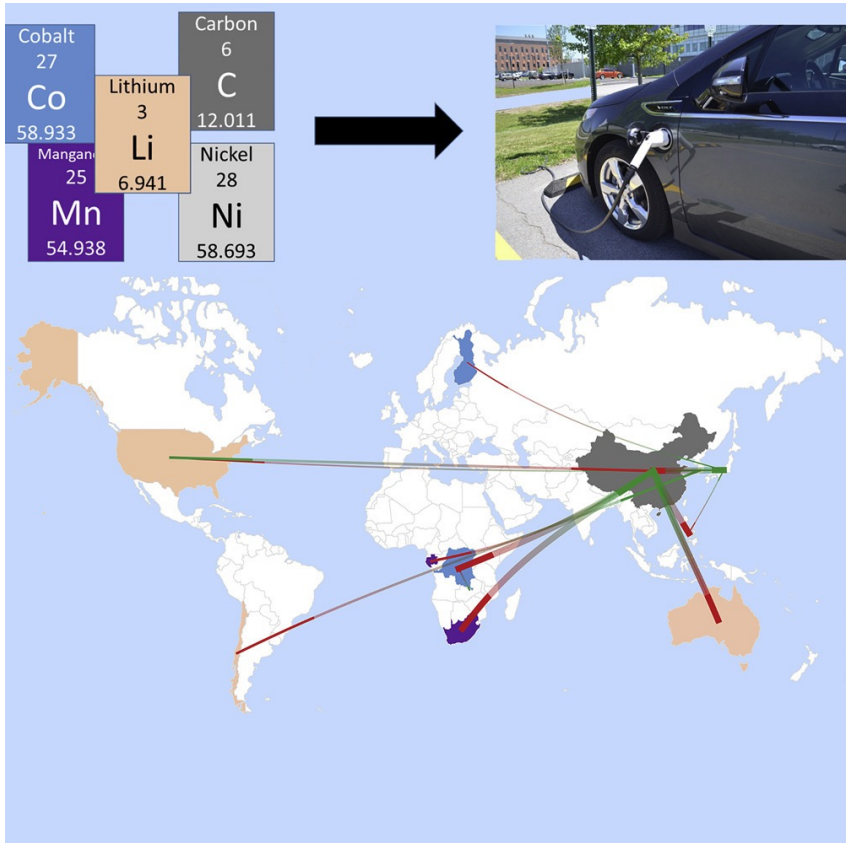
- Defining system boundaries is subjective.
- The things you can discover about a system depend on where you draw the boundaries.
- Why do systems and boundaries matter for STEM?
- Let's walk through an example.

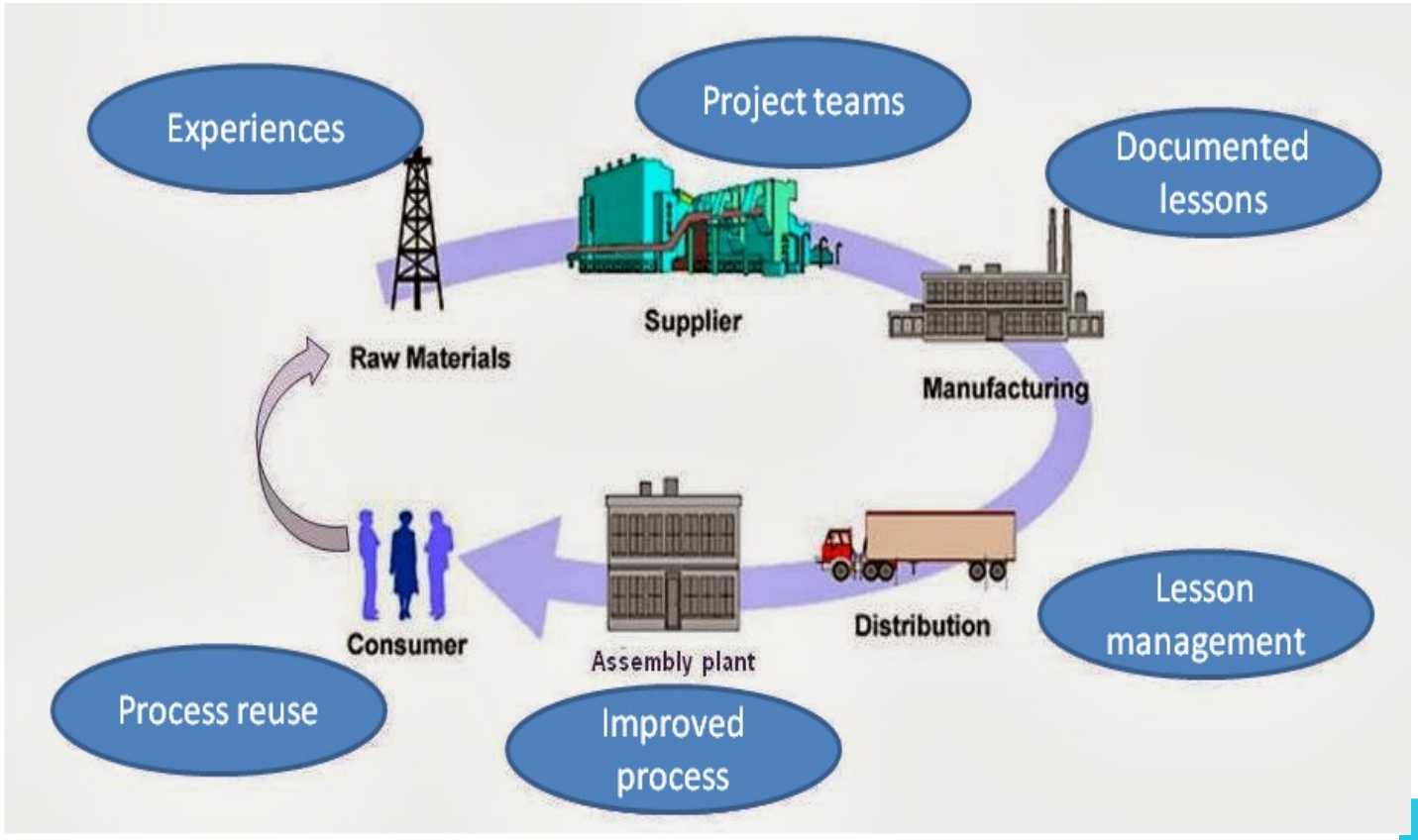


# What is this?


How about this?
TESLA
SUPERCHARGER

# Add raw materials and lifecycle



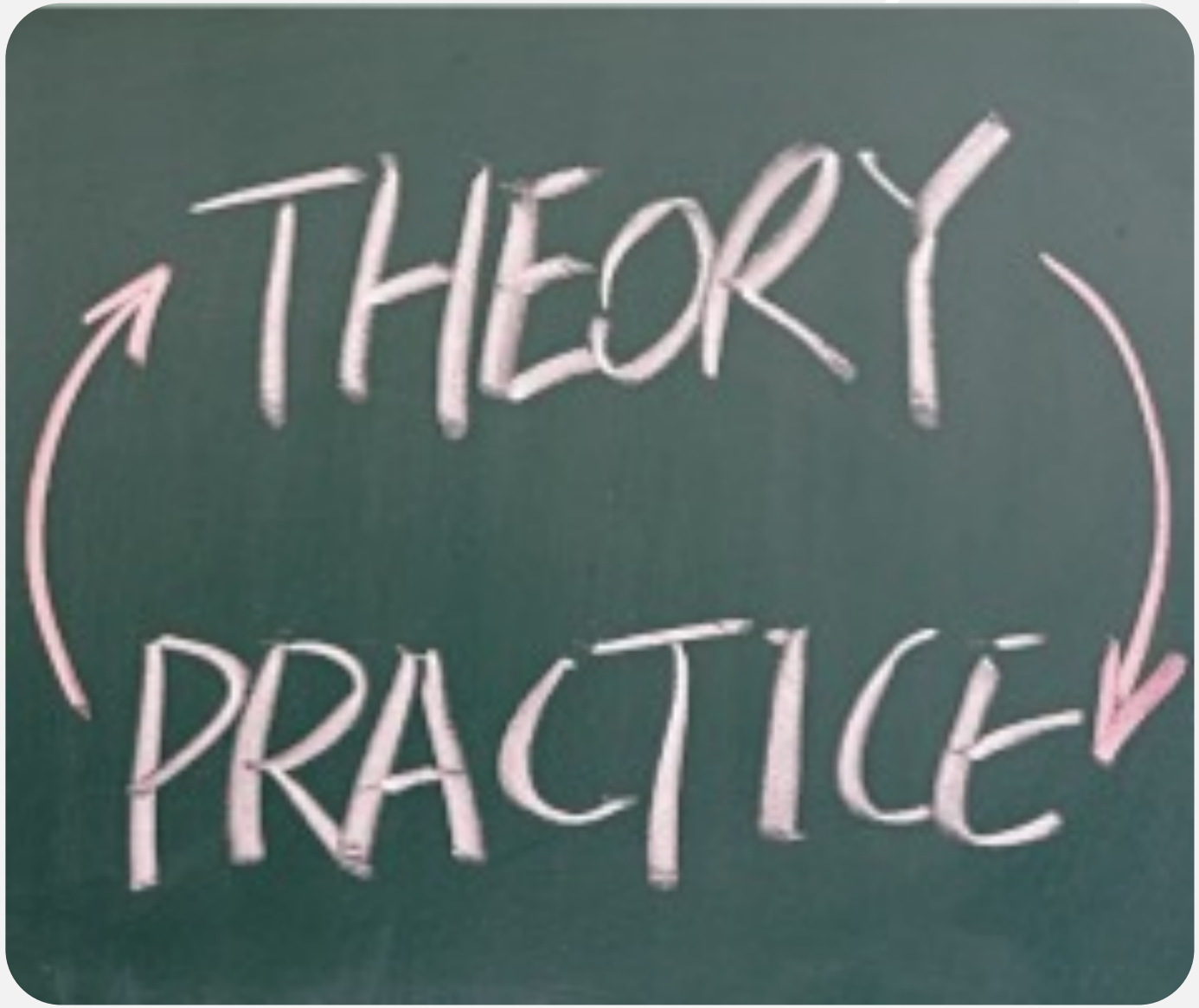



# Now add people and infrastructure

- Organizations
- Consumers
- Regulators
- Service providers
- Corporate buyers
- Utility (electrical) companies
- International energy security

Now connect this to the theory of your choice

- Sociotechnical Systems
- Inclusive design
- Sustainable engineering
- Etc.



# Alternate Starting Points

- Sketches of imagined artifacts
- Imagined artifacts from the future
- Proposed technologies (look at mock-ups from companies, ex. Google Glass)
- Emerging technologies
- Short stories that describe a technology
- Improv sketches exploring an idea
- Physical demos your students build

- Could use as lecture material or as an assignment that students build to share with one another

# Let’s build some demos!

1. Choose an example you’d like to use
2. Find a picture of just the technological artifact
3. Find a picture of the artifact in a place
4. Find a picture of the artifact with people
5. Tie it to a theory you’d like your students to explore

# Thank You!

Now let's workshop some ideas!

I'm happy to chat or collaborate anytime.

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