

DEFINING YOUR PROBLEM, SYSTEM DIAGRAMS

WEEK 3, STUDIO DAY 2

AWARENESS TRAINING

Don't think the purpose of awareness is to go deep into consciousness,
wrap a blanket around yourself, and say,

"How cozy! I'm going to curl up in here by myself;
let the world burn." Not at all!

We grow awareness so that we can reach out
farther and farther to the world outside.

Through awareness we are going deep into ourselves,
into the utter solitude that is within.

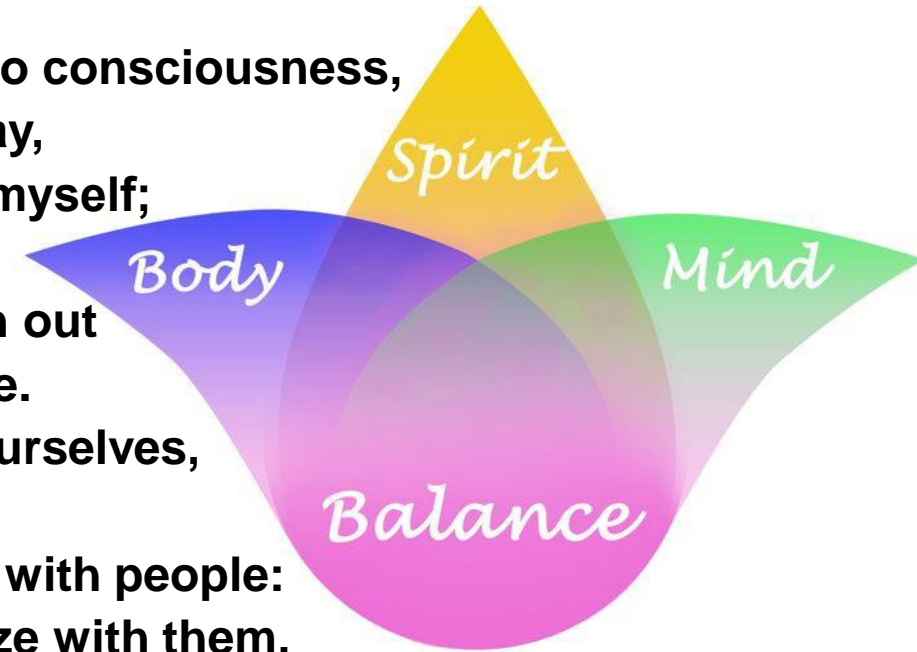
As a counterbalance to this, it is necessary to be with people:
to laugh with them, to sing with them, to empathize with them,
and to serve all of life.

-Eknath Easwaran

The person who remembers they can always reach out and help others-
never runs out of things to do, always has friends, and rarely needs advice.

"Give it away, give it away, give it away, give it away now,"

-Mike Dooley



TODAY

Welcome Back!

- **Discussion: Empathy exercise, readings**
- **Defining your problem**
 - Stakeholders
 - System diagrams

DISCUSSION

- **Insights from User Empathy experience?**
- **Insights from the two readings?**
- **Do you understand the problem better/worse?**
- **Did your perspective of the problem/stakeholders change?**

A WORD ON YOUR PARTICIPATION GRADE

5 points assigned in week 7

5 points assigned in week 16

3 parts:

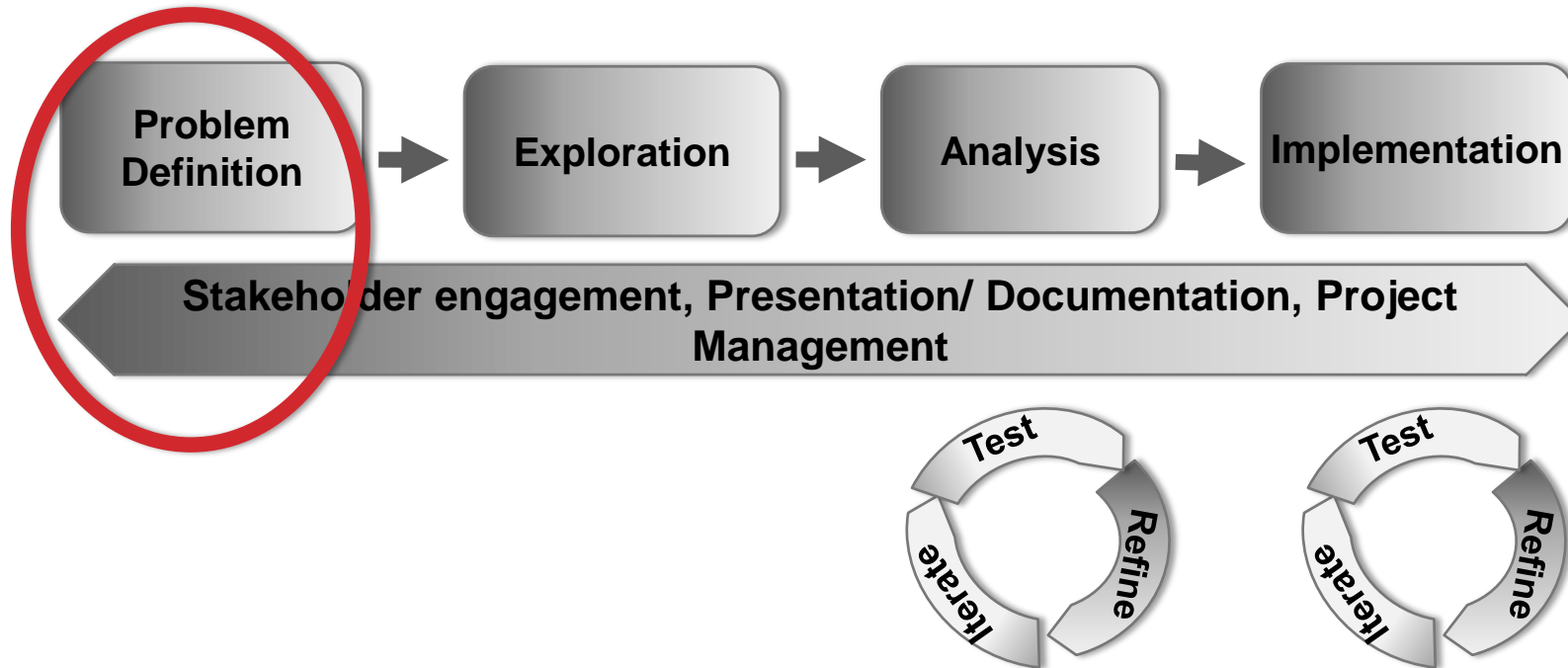
- **Engagement – active in class, design log, pre-work? (3 pts)**
- **Relevance – comments in class (1 pts)**
- **Respect – respectful to others perspectives? (1 pts)**

TODAY'S OBJECTIVES

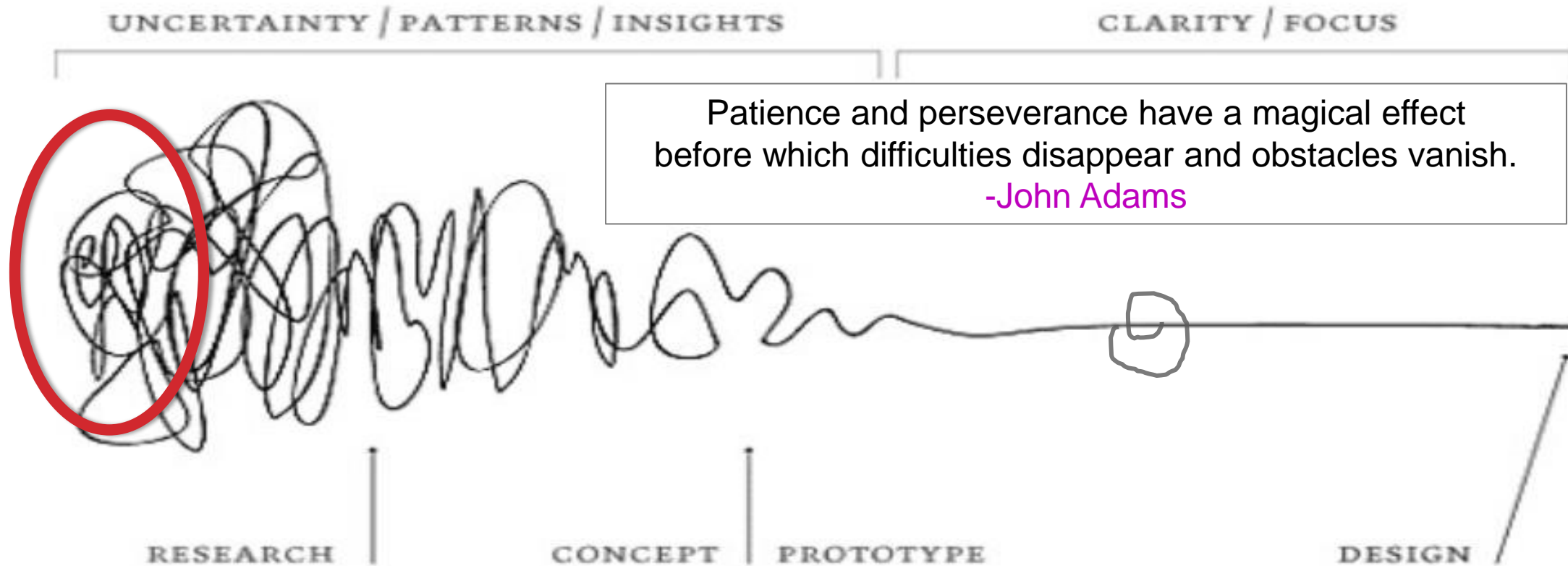
1- Identify, breakdown, and define open-ended problem(s).

- 1.2. Verbalize, review and refine the problem statement to reflect the design intent and project direction
- 1.3. Define a system by its inputs, outputs, and key functions.

WHERE ARE WE IN THE DESIGN PROCESS?



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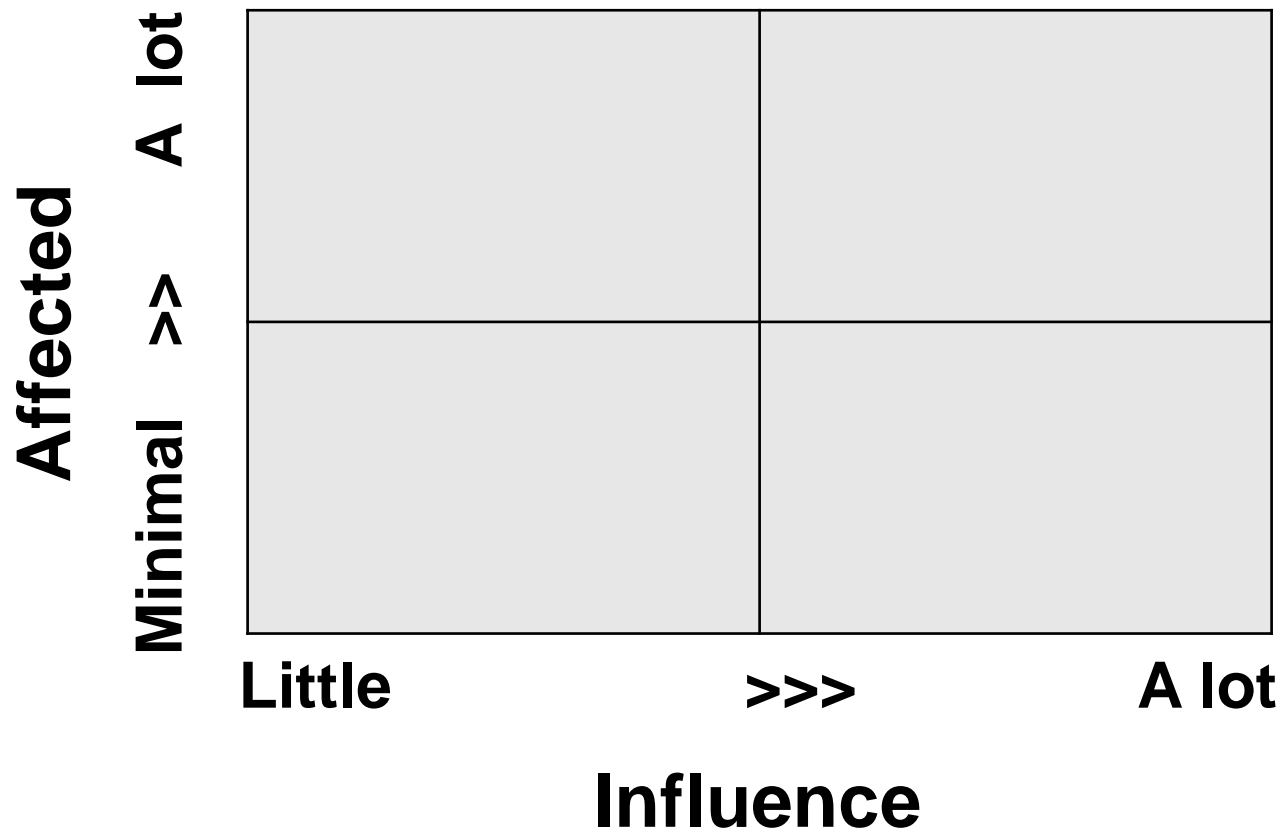


STAKEHOLDERS

DEFINING/UNDERSTANDING STAKEHOLDERS

Who are the “stakeholders” of this challenge?

- (individually) How would you prioritize whose input might be useful?



3-4 minutes

INVOLVING USERS THROUGH THE PROCESS

- **How do you get in touch with them?**
- **This is hard!**
- **Because it is hard – this is where people fail!**
- **How is this done in industry?**
- **Brainstorm ideas as class**

USER-ENGAGEMENT PLAN

- **As a team**, determine key stakeholders to help you in your problem, and brainstorm ways to engage with them
- Determine tasks to drive engagement, and *assign owners to each task*

3-4 minutes



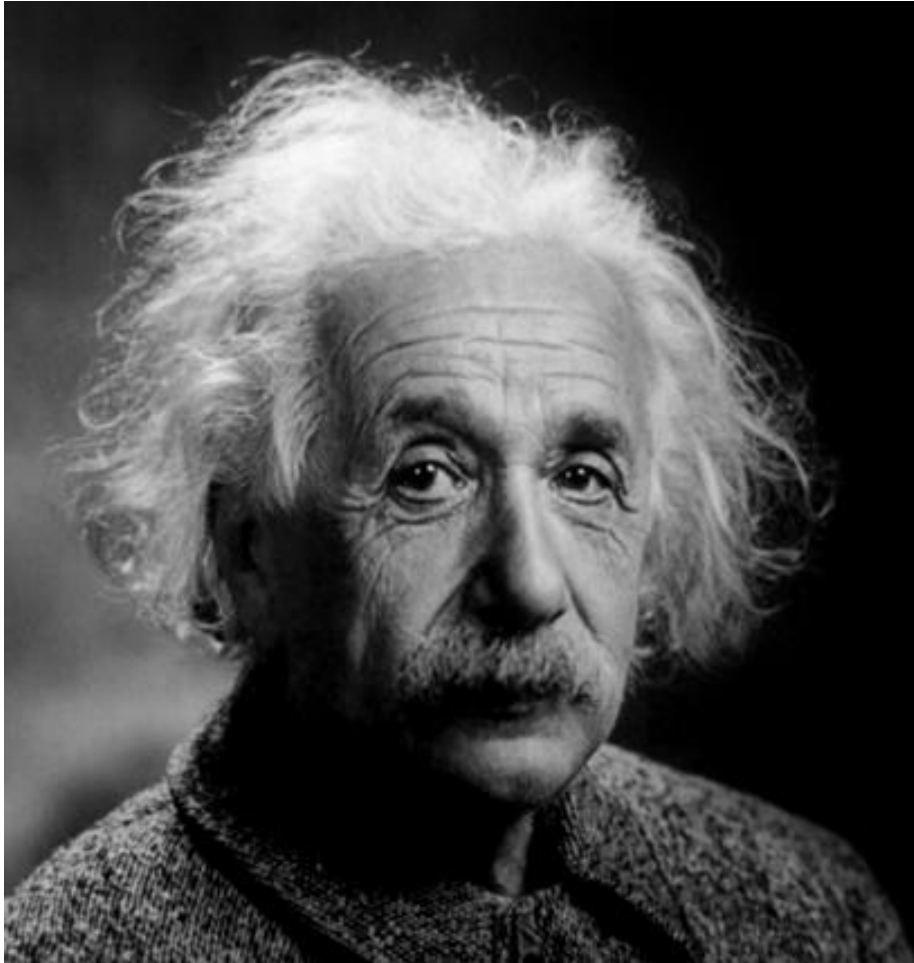
SUBJECT MATTER EXPERT (SME) WEEK - NEXT WEEK!

- **Special Lecture from Humanitarian Engineering Program with entrepreneur and author Paul Polak (Out of Poverty)**
 - 4 pm Tuesday the 13th CO209
- **9/16 Friday, Metals Hall**
 - Schedule TBD, will include:
 - Go Farm
 - Hydroponics
- **Your Own SMEs**

PREPARING TO INTERVIEW:

- **Do your research** – *don't waste time asking your interviewee what you can easily find online*
- **Plan your interview**
- **Be prepared with good open-ended questions**
- **Bring a notebook and take good notes, or a recording device (with permission)**
- **Awareness and engagement (more than just spoken words)**

DEFINING THE PROBLEM



"If I were given one hour to save the world, I would spend 59 minutes defining the problem and one minute solving it."

Albert Einstein

LET'S DEFINE THE PROBLEM YOU'LL SOLVE

We start with your experience! List what you know of the problem now

- What causes it?
- How does the problem vary?
- What does it actually look like...
 - In Sun Valley neighborhood of Denver?
 - In Philadelphia?
 - In Golden?
- Who's affected by it, and how does that vary across different groups?



3-4 minutes

WHAT YOU DON'T KNOW YET

What's missing in your knowledge of this problem?

Consider from multiple stakeholders.

List out questions. Highlight the key ones.

3-4 minutes



FIND YOUR OWN PROBLEM DEFINITION.

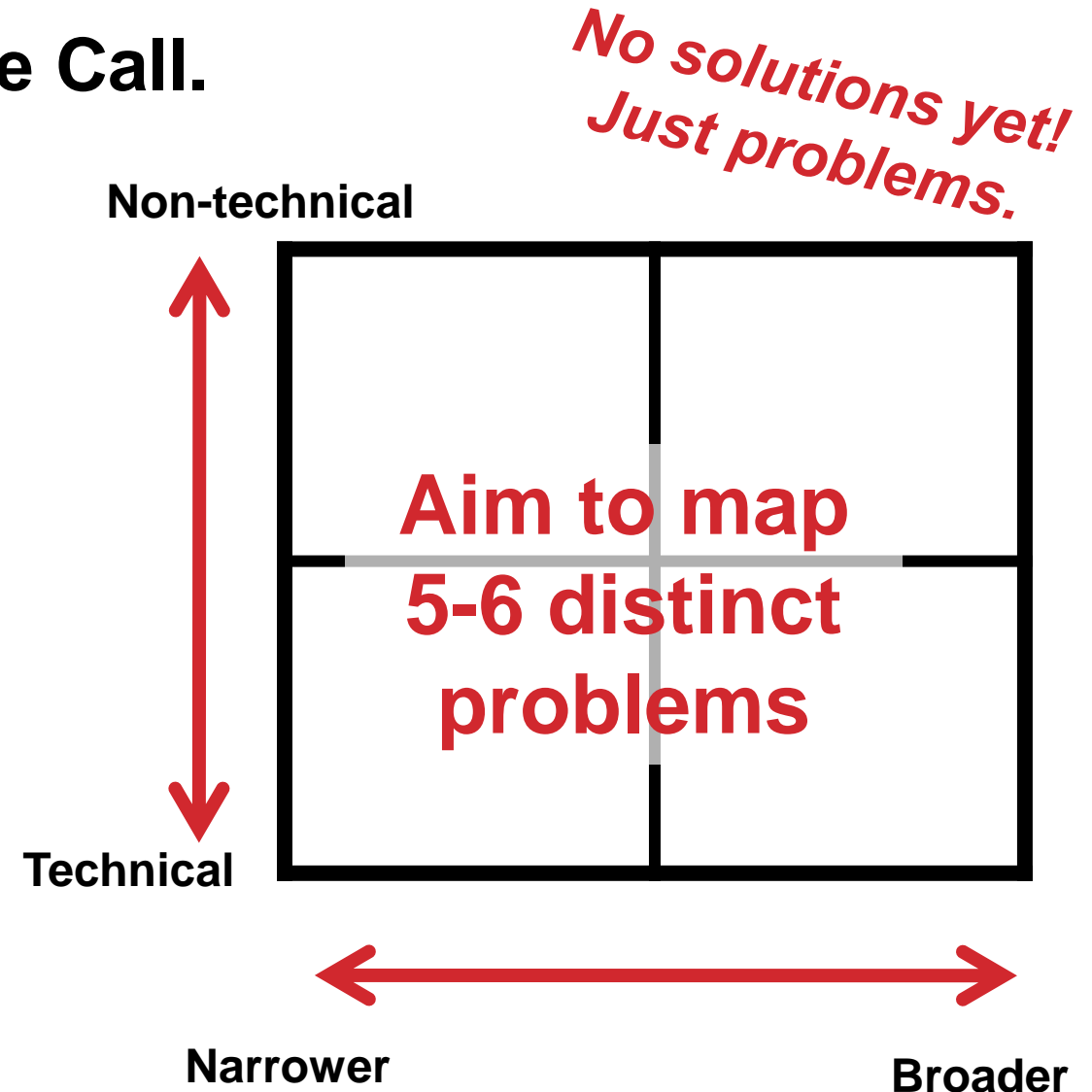
Plot the definition that's teed up in the Call.

Then plot several more approaches:

- Go broader
- Go narrower
- Consider multiple perspectives
- Frame as “how might we...?” or “what are the ways to...?”



7-8 minutes



SYSTEM DIAGRAMS

BREAKING A BIG PROBLEM INTO BITS

VIDEO (9.5 MIN) - <https://vimeo.com/181090371/0e1b8ce946>

How do we define **Food Production**?

What is the fundamental **output(s)** of all these options?

What is the fundamental **input(s)** of all these options?

What are the fundamental **tasks/functions** performed by all these options?

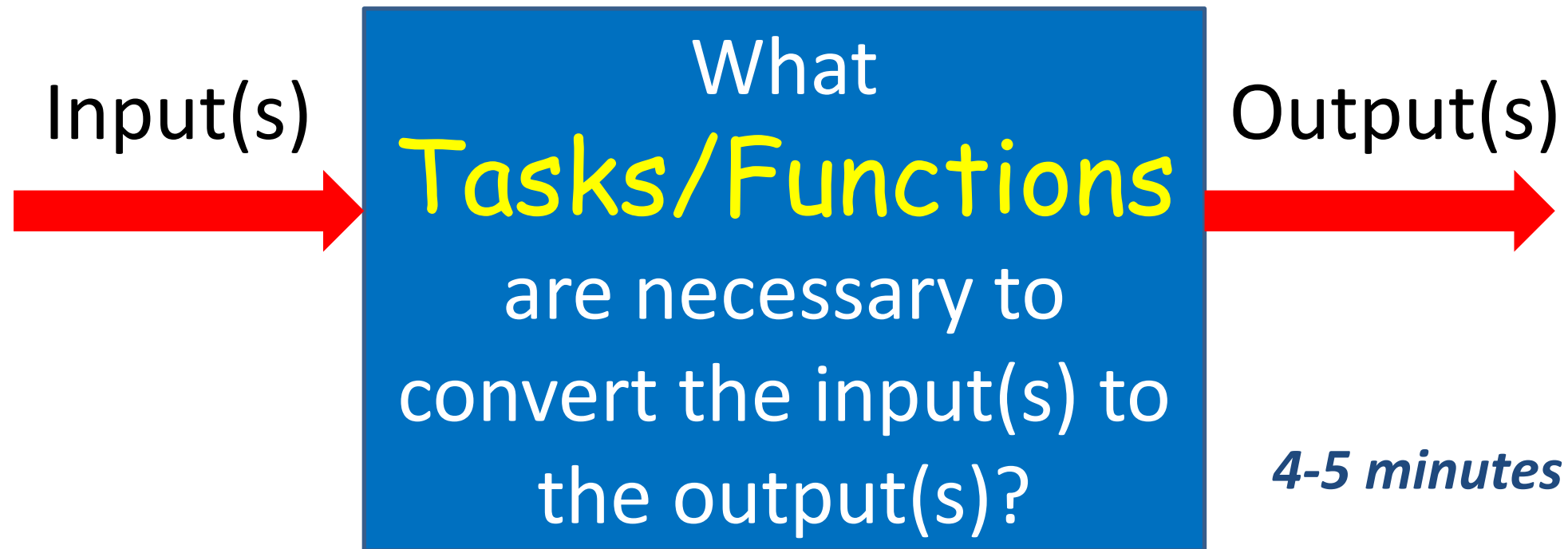


Draw the system diagram for **Food Production**

What is/are the fundamental **output(s)**?

What is/are the fundamental **input(s)**?

What is/are the fundamental **tasks/functions** required to convert the input(s) to the output(s)?



4-5 minutes



SYSTEM DIAGRAM GROUP WORK

In your teams, look at the food production system diagram. How well does it fit for YOUR food problem definitions?



2 minutes

CHOOSING YOUR DEFINITION

Add to and review your problem definitions: **circle** ones you could use this semester.

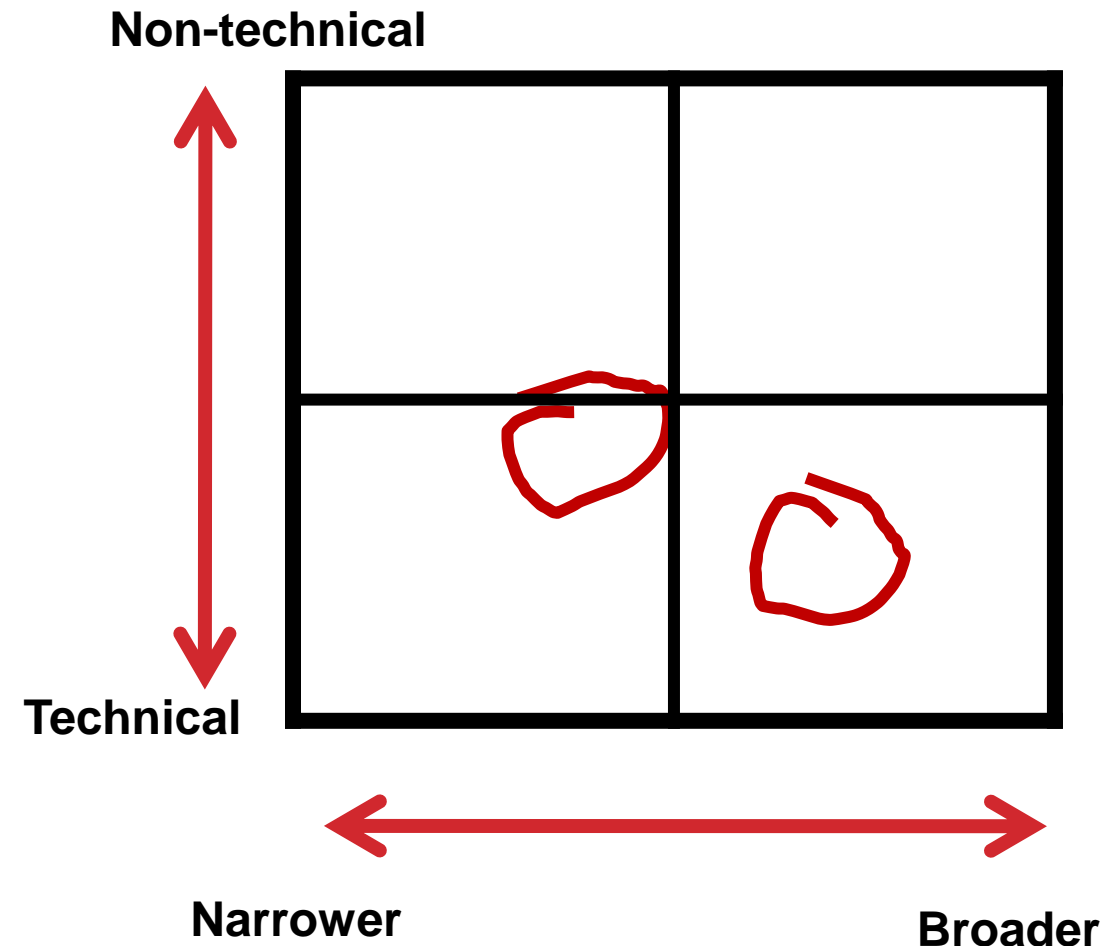
Keep iterating!

Fail early and often!

I am available to help!



5-6 minutes



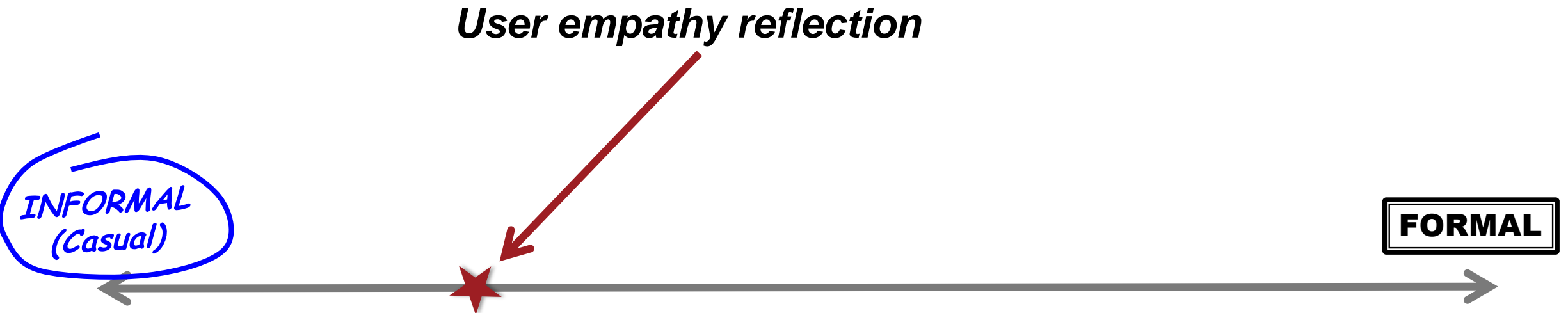
(DRAFT) PROBLEM DEFINITION - DUE SEP 13 (IN CLASS)

To prepare for research discussion next week:

- **Consider your empathy experience Consider today's classwork**
- **Bring in your highlighted key questions, bugs lists & notes**
- **Keep writing more questions down.**
- **Bring your articulated problem definition statement with a given context/setting and set of stakeholders**

ASSIGNMENT, USER EMPATHY REFLECTION DUE SEPT 15

See posted guidelines and rubric



COMING UP NEXT WEEK!

Project Day 1:

- Library: authoritative and scholarly resources, bring Design Log
- **ASSIGNMENT:** from library. Due Friday night for Mon-Wed and Sunday night for Tues-thurs.

Project Day 2:

- Group work: refining problem definition, team contract
- **ASSIGNMENT:** User Empathy Reflection due

Tuesday:

- HE Special Lecture, Paul Polak (Out of Poverty)

Other dates, TBD:

- SMEs

Graphics:

- CAD (Computer Aided Design) begins with SolidWorks