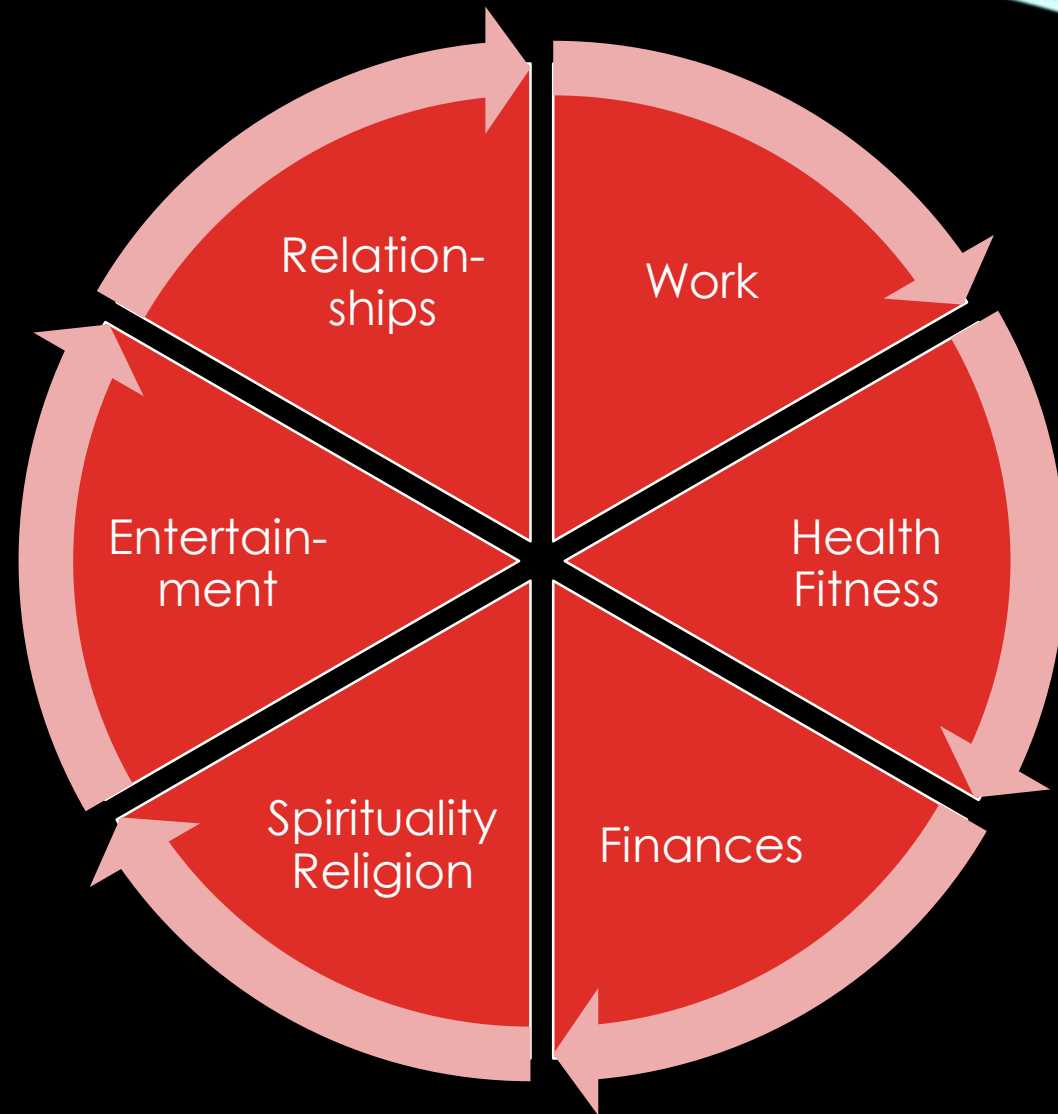




# THE ROAD LESS TAKEN: PATHWAYS TO ETHICAL AND RESPONSIBLE TECHNOLOGIES

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# TECHNOLOGY IS ABOUT LIVING – ADDS COMPLEXITY





power of technology



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About 3,930,000,000 results (0.41 seconds)

**We can use technology to improve our lives and bring us together or allow it to leave us frustrated.** The result is up to us. Technology has created great tools that can help us connect with others at a distance, but it is also valuable to connect with others across a dinner table, on a bus, or in a checkout line.

Feb 14, 2018





Impact on  
Organization

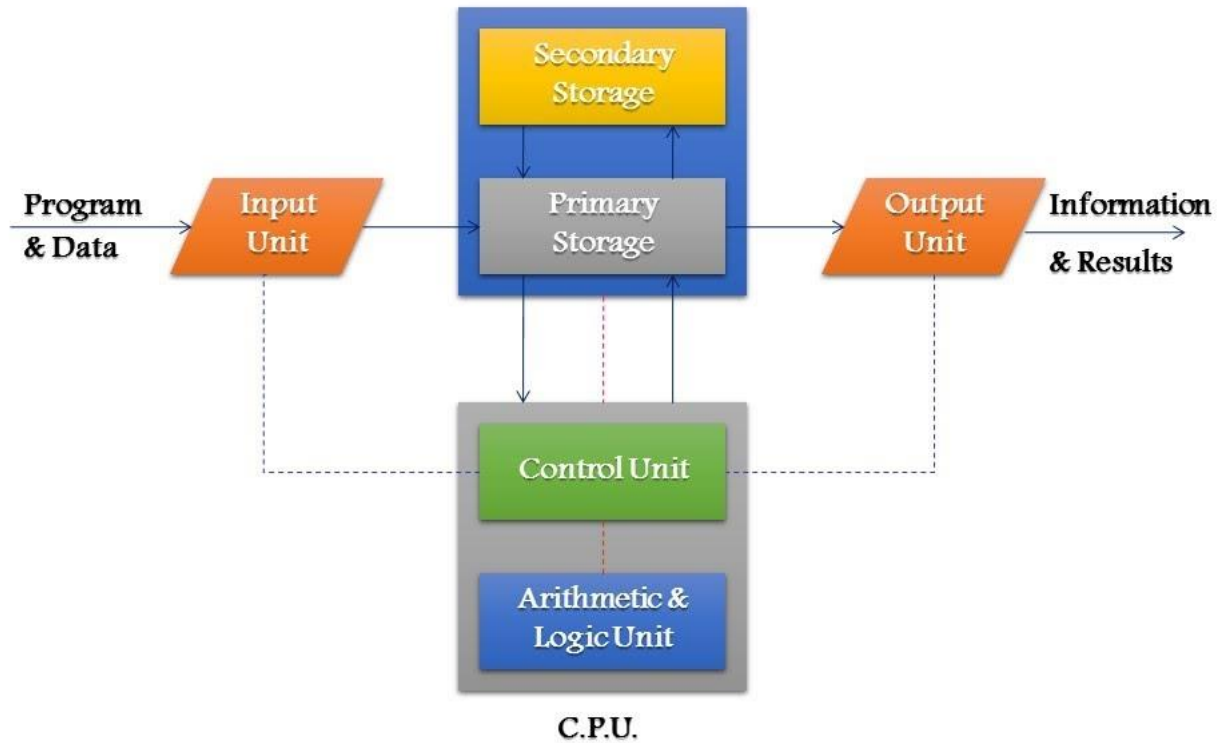
Technology

Organization's  
Needs

EARLY IT:  
HUMAN-ADJACENT

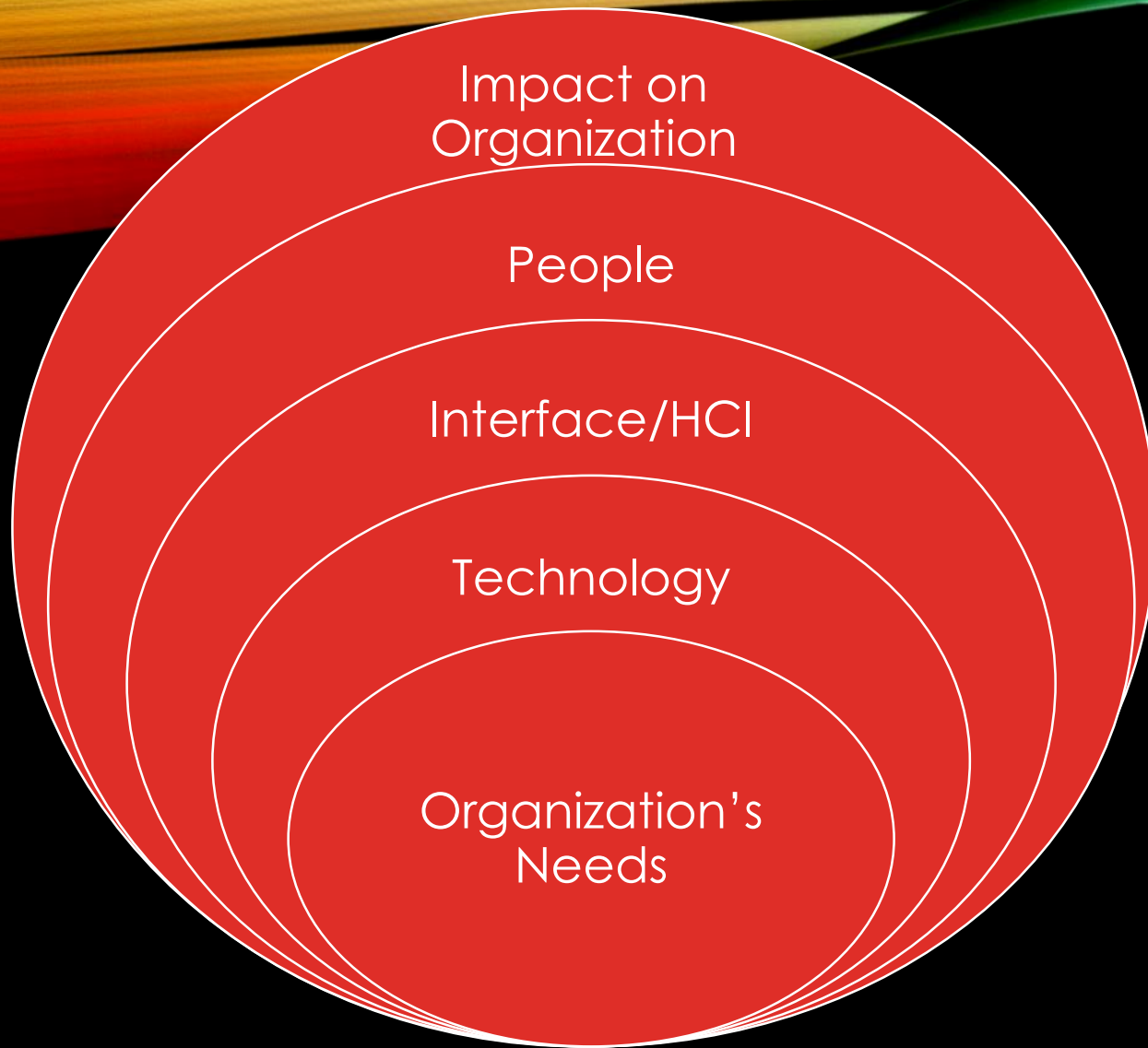
DRIVERS ARE  
ORGANIZATION  
NEEDS

# BLOCK DIAGRAM OF COMPUTER



HUMAN NOT  
SHOWN

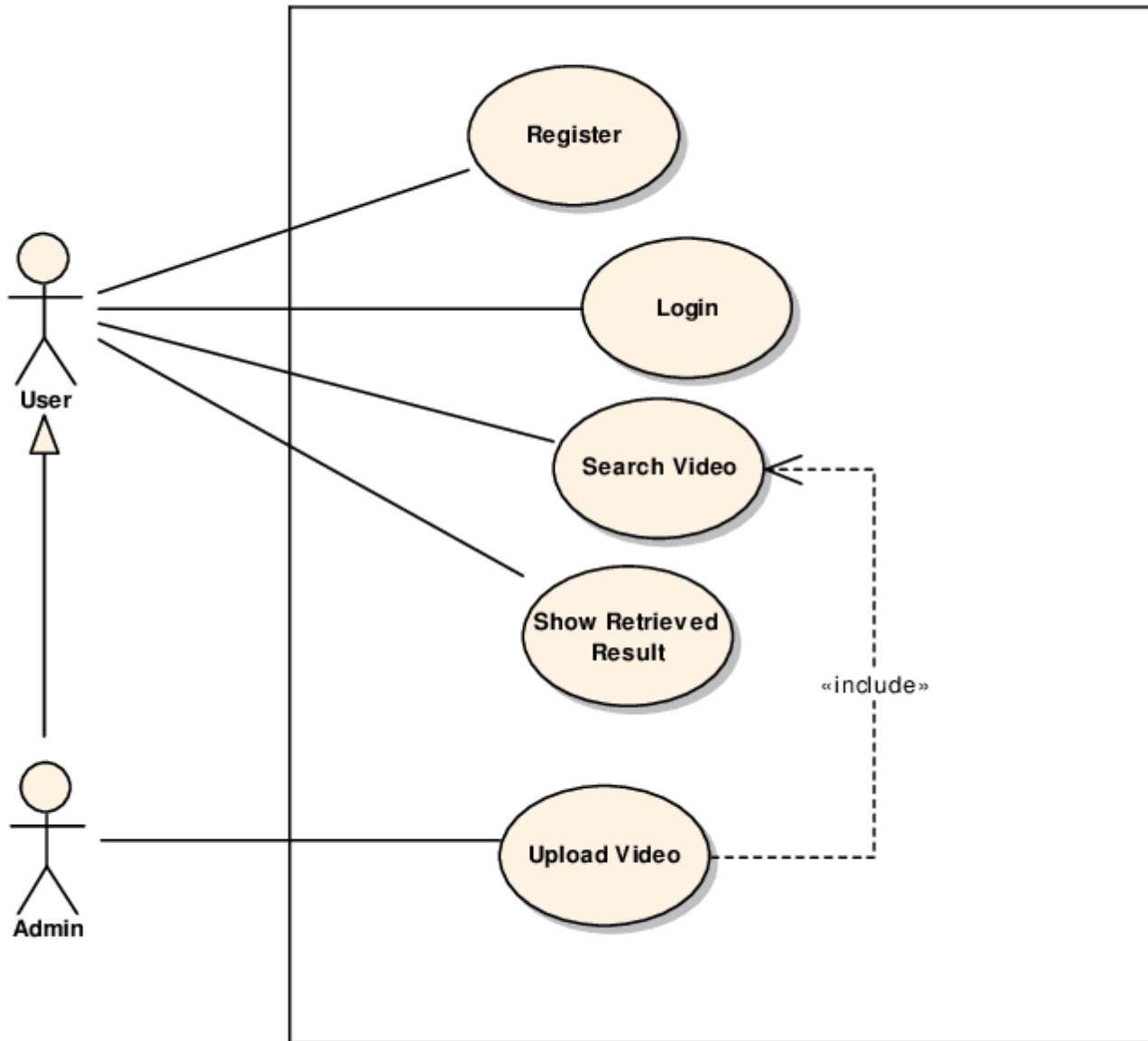




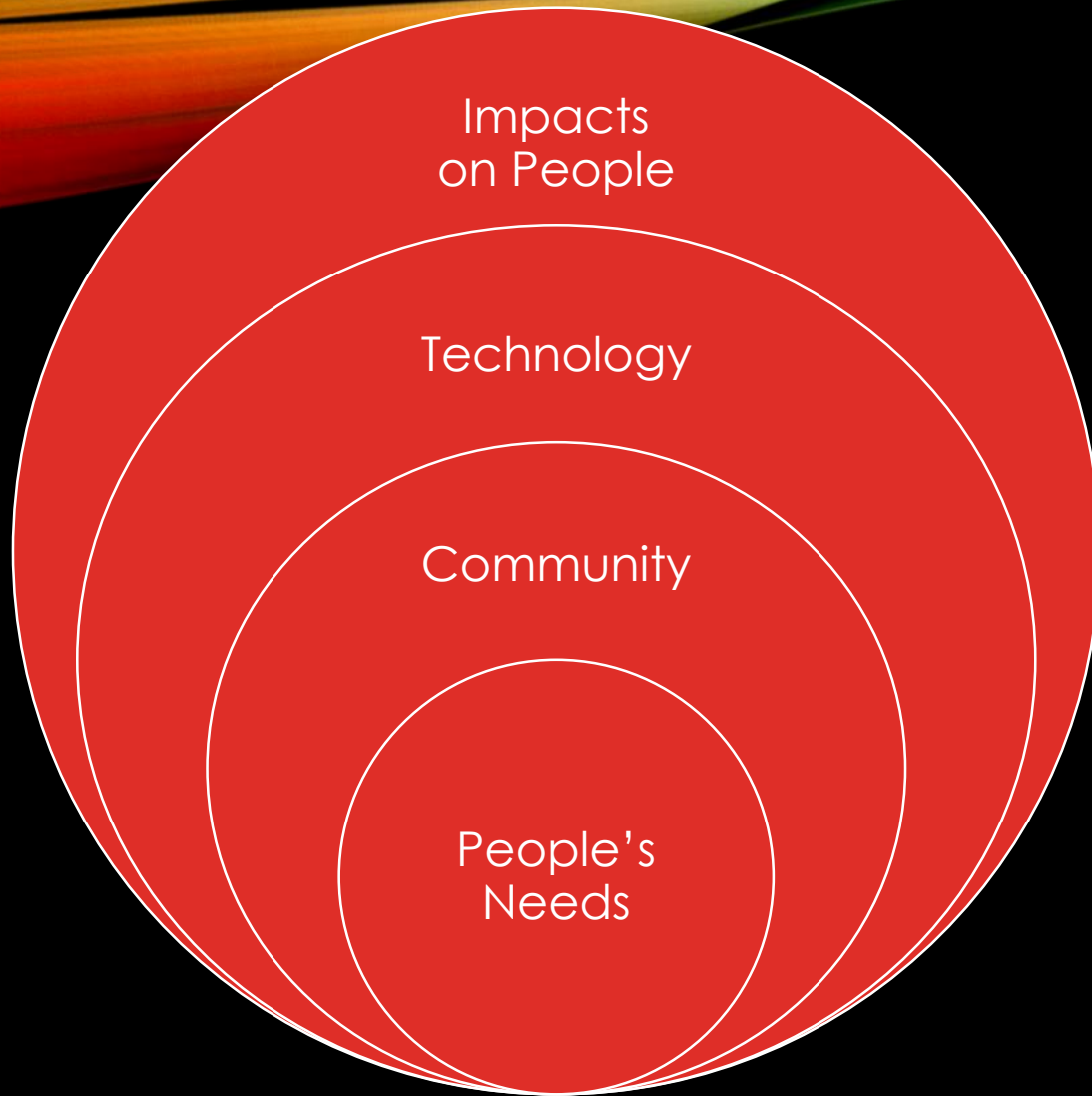
IT AS HUMAN-AWARE:  
DRIVERS ARE  
ORGANIZATION NEEDS

RELIES ON HUMAN  
ACTIONS

ADDS COMPLEXITY!



HUMAN IS SHOWN,  
BUT OUTSIDE OF  
THE SYSTEM



IT AS HUMAN-CENTERED

DRIVER IS PEOPLE'S  
NEEDS

INCREASES COMPLEXITY





HUMAN-  
CENTERED

THIS IS  
HARD!

# MUST RADICALLY TRANSFORM

- How we **think** and **talk about** technologies
- How we **develop** technologies
- How we **use** technologies



# LANGUAGE, MEANING, METAPHOR

## Technologies as People

- Artificial **intelligence**/machine **learning**
- **Smart** City
- **Autonomous** vehicle
- **5G** (5<sup>th</sup> Generation)
- **AI** as **Partner/Teammate**



# TECHNOLOGIES AS

## People

- Artificial **intelligence**/machine **learning**
- **Smart City**
- **Autonomous Vehicle**
- **5G**
- **AI as Partner/Teammate**

## Things We Create

- **Pattern matching**
- **Cyber-physical system**
- Vehicular **Robot**
- **Networking standard**
- **Tool**



**USE THINGS  
NOT PEOPLE  
LOVE PEOPLE  
NOT THINGS**



# HUMAN-CENTERED DEVELOPMENT: OBJECTIVES

- A safe and just space for humanity
- Strong social foundation
- Within an ecological ceiling

Donut Economic Model



# HUMAN- CENTERED DEVELOPMENT

- Diverse stakeholders
  - Individuals, communities, advocacy groups
  - Especially marginalized, silenced communities
- Equal partnership
  - Complementary expertise to solve real problems
  - Compensation and commitment
    - Non-extractive relationship



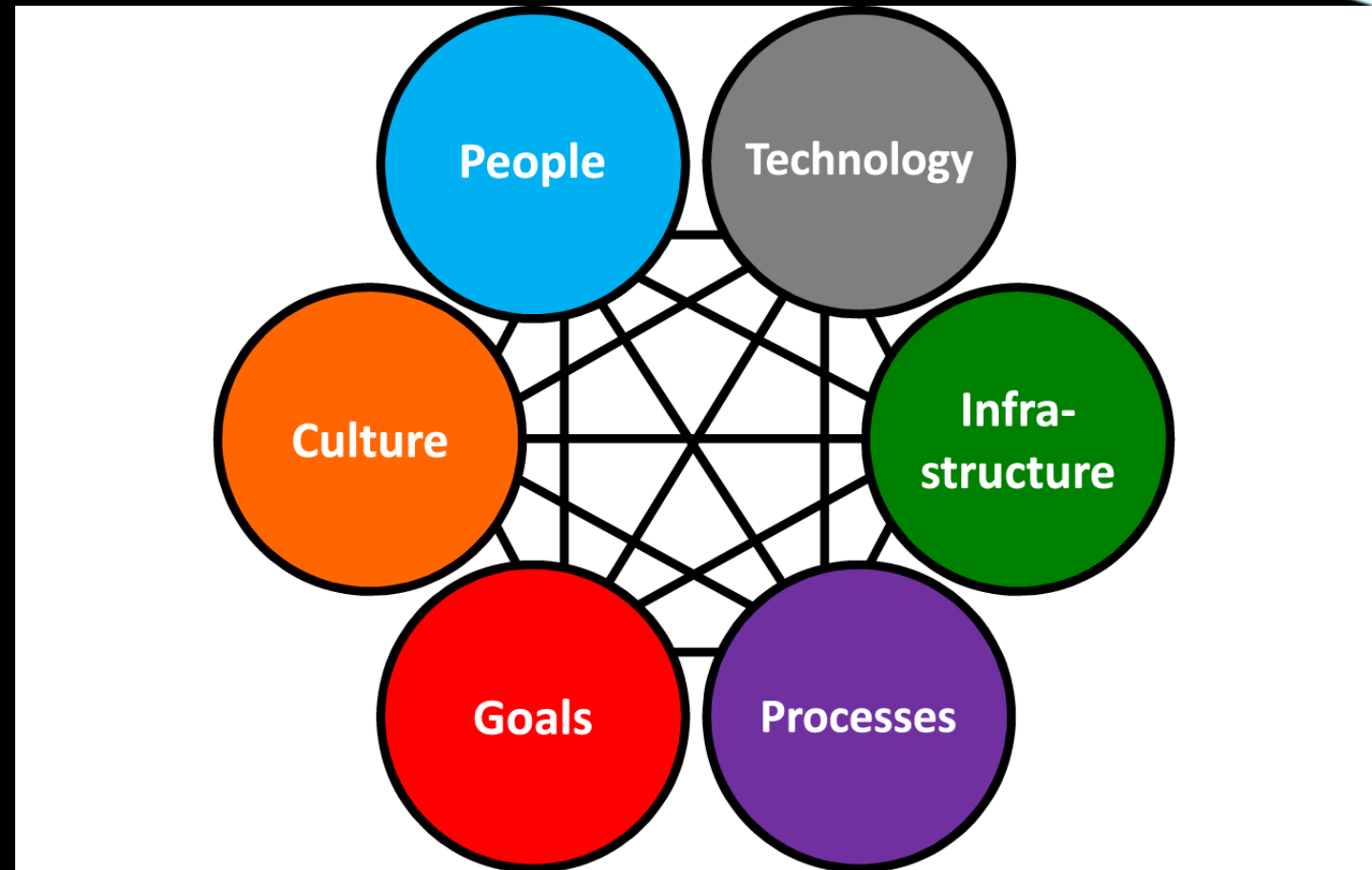


# HUMAN-CENTERED DEVELOPMENT

- Engagement
  - Who is included? Nothing about us without us!
  - Who leads?
  - How are decisions made?



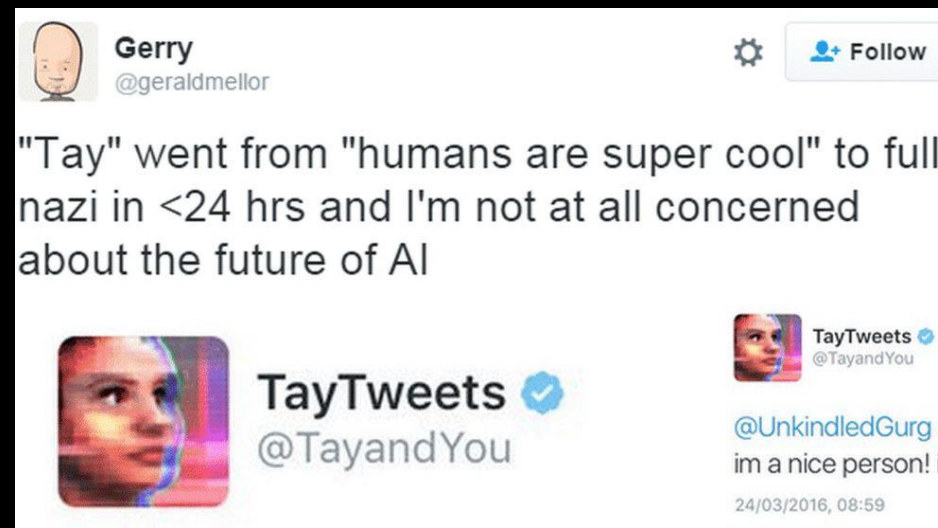
- Understand the **socio-economic - technical system**
  - Everything is connected
  - Cannot change 1 thing
- Identify needs



# SOCIO-ECONOMIC- TECHNICAL SYSTEM

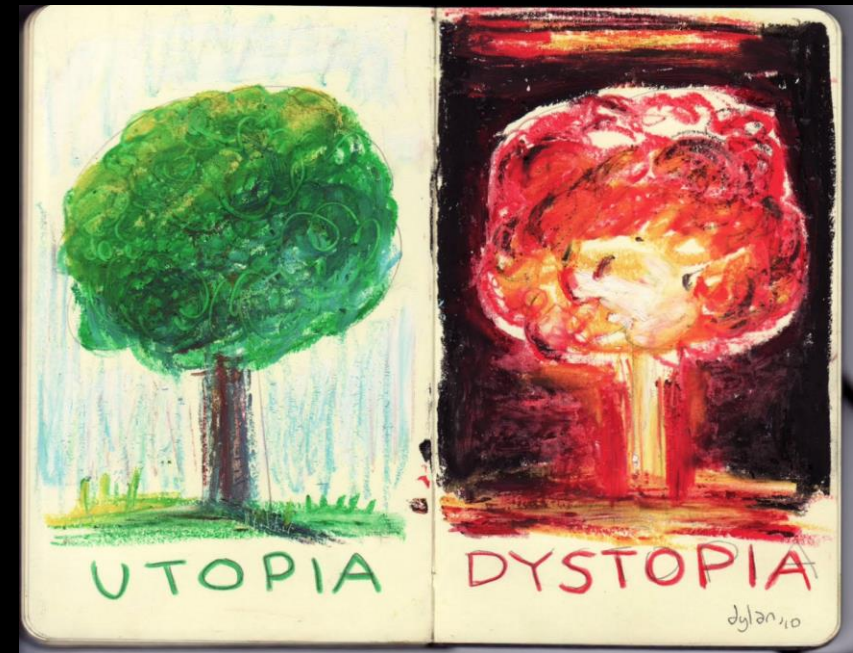
# HUMAN-CENTERED SOCIO-ECONOMIC- TECHNICAL SYSTEM CO-DESIGN

- Designing a **system** that **includes people**, institutions, technologies, the physical environment, etc.
- All elements are **constantly changing** and co-adapting
  - People are especially creative – hard to predict
- How will you **monitor** and make **changes**?



# CO- DESIGN

- **Interventions** can be social, economic and/or technical
  - Build on **strengths**, abilities, assets
  - Be **creative** - imagine positive and negative
  - Other **system components** will be affected
    - Don't let the perfect be the enemy of the good
    - Reduce negative, Increase positive effects
    - Build-in resilience
- Design **new elements**
  - What else is needed?
    - Complementary assets







MAXIMIZE HUMAN CONTROL: INFORMATIVE INTERFACE

NOT  
'FIRE  
AND  
FORGET'

- Co-design **system** and its **management**
- Implementation
- Assessment of initial impacts on the system
- Ongoing assessment, **management of the system**
  - Build in **communication channels**
  - Sensing, evaluating, correcting
    - Intended and unintended effects





# ETHICAL, RESPONSIBLE TECHNOLOGY

- Technology as a **tool** to reach **people's goals**
- **Co-Design** with **diverse** and **equal partners**
  - Especially **marginalized** communities
- Focus on **socio-economic-technical system**
  - Initial analysis and intervention design
  - **Continuously monitor, manage, improve**
- Strengthen **social foundation**, meet **human needs**  
Within **ecological ceiling**

