Method Recommendations

Equitable Interfaces/Ethical Experiences (EI/EX):

An approach to technology development and application that uses systems and design thinking to integrate the perspectives of the people impacted

Introduction

The recommendations in this document were compiled from the work of an interdisciplinary team funded by the Pardee RAND Tech and Narrative Lab (TNL) in the summer of 2022. The method outlined below is intended to suggest activities for the refinement of the EI/EX method through its application to a specific implementation of technology in the education space. This outline is not intended as a linear process, but rather a set of interrelated activities that take place concurrently and iteratively.

Note that although these methods have been piloted and refined in other policy areas by members of the RAND Corporation EI/EX team and other researchers, they have not been integrated within the context of a full implementation of EI/EX. We believe these tools will be useful to address the ethical implications of emerging technology, but they will require further development and adaptation.

More details of the work created by the summer sprint team can be found at the links below or by emailing the project PIs:

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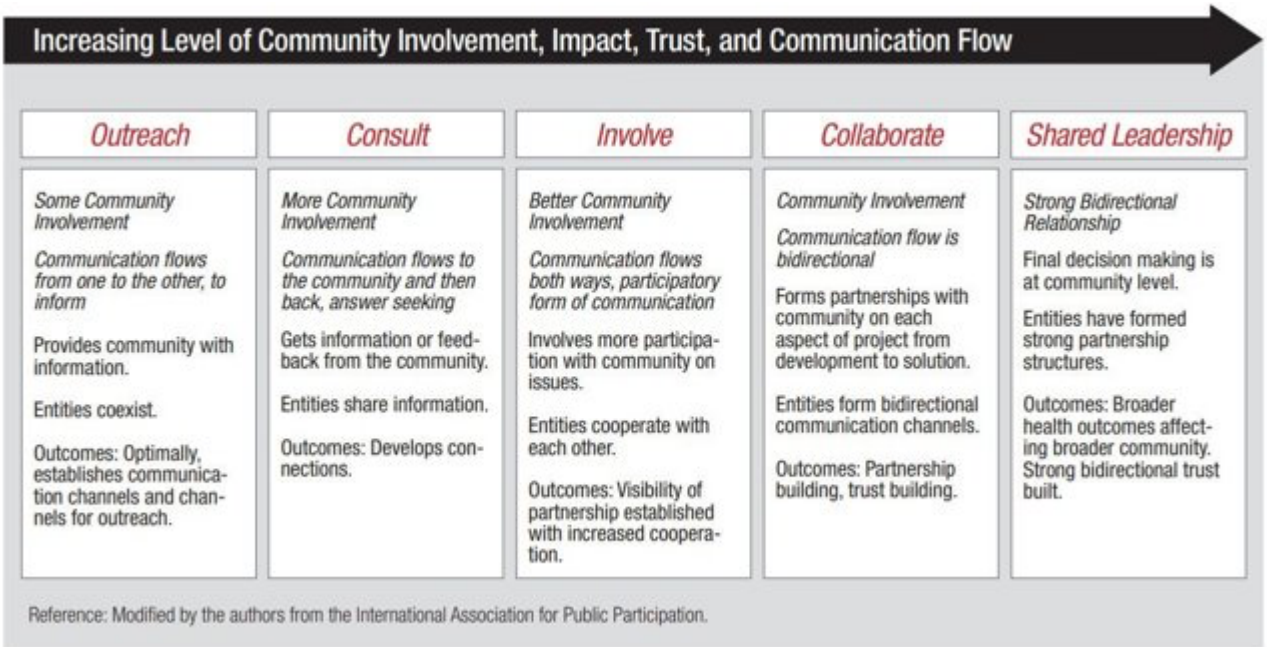
Method Outline

Frame the technology

- Identify a specific technology application and begin researching communities that are impacted
- Recruit community partners
- Establish the stated goals of the technology, scope of use, baseline/historical trends for key metrics and other background elements

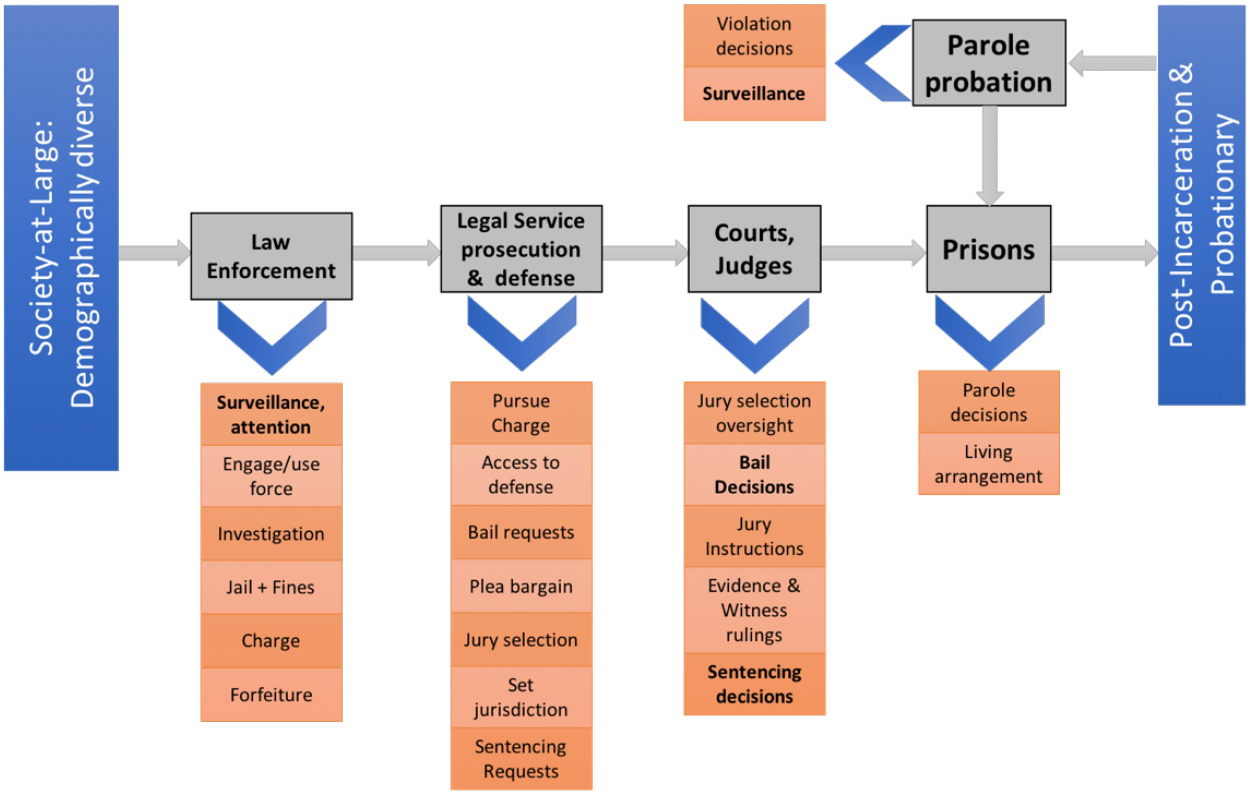
Build community partnerships

- Identify other efforts or existing networks/partnerships addressing the same problem, question, or intervention
- Consider a representative panel from community partners to establish decision-making
    - Take time to ensure participants are informed on the issue
    - Participants should be compensated for their time
- Build shared leadership from community outreach
    - Tool: Partnership Planning
        - Examine Outreach --> Share Leadership graphic below and ask where each step can be better integrated into the design plan
        - Source: CDC Agency for Toxic Substances and Disease Registry (ATSDR), 2022



Document the status quo

- Document existing policies related to this technology
- Understand the current decision-making process within tech companies and within school districts
    - Decision-making process within tech companies
        - Are inputs solicited from stakeholders? Who? When? How?
        - Which considerations are prioritized? Who makes those decisions?
        - How is the technology marketed to users? Are there differences in marketing strategies based on the target stakeholder audience (e.g., students, teachers, administrators, law enforcement)?
    - Decision-making process within school districts
        - If inputs are solicited, what is decision-making process within educational stakeholder organizations (e.g., school districts, school administrators, teachers, boards of education) for reviewing, adopting, implementing, and evaluating the technology?
        - How and when are priorities determined during these processes? Who participates in the prioritization process?
        - Is there transparency in the decision-making process for the various stakeholders?
        - Are there efforts to internally promote and incentivize adoption?
- Tool: Decision Pipeline
    - Document how the technology is used
    - Describe when the technology comes in and when humans come in. See example below regarding criminal justice decision-making
    - Validate this with community partners
    - Source: Osoba *et al.*, *Steps Towards Value Aligned Systems*, 2020

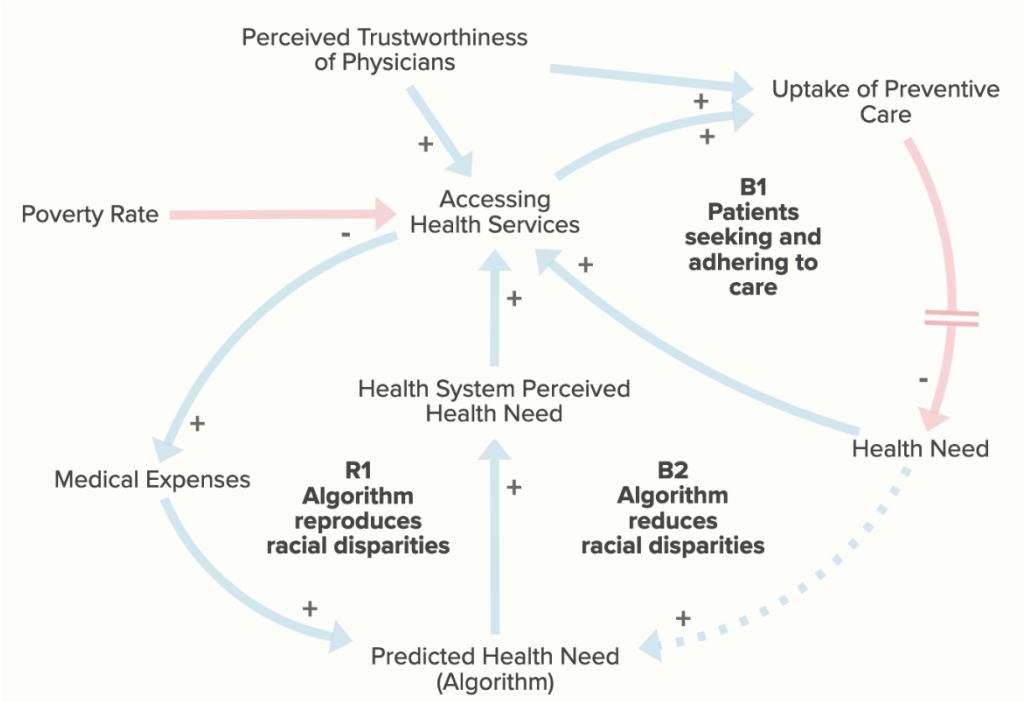


- Tool: Narrative Matrix
  - "From" on one side, "To" on the other side with stakeholder groups listed on each side to lists messages about the technology. An example of a partially completed matrix is below.
  - Validated from discussions with community partners

Messages		From							
		students	parents	teachers	administrators	companies	government	law enforcement	public
To	students			For learning					
	parents								
	teachers					Improves learning			
	administrators							Over burdened	
	companies						Under-regulated		
	government					Over-regulated			
	law enforcement					Improves safety			
	public								

- Tool: Causal Loop Diagram (CLD)
  - Diagram initial understanding of the technology system
  - See Tomoaia-Cotisel *et al., Causal Loop Diagrams*, 2017 for guidance on how to do this

- Example CLD visualizing an algorithm failure, as described here[1]



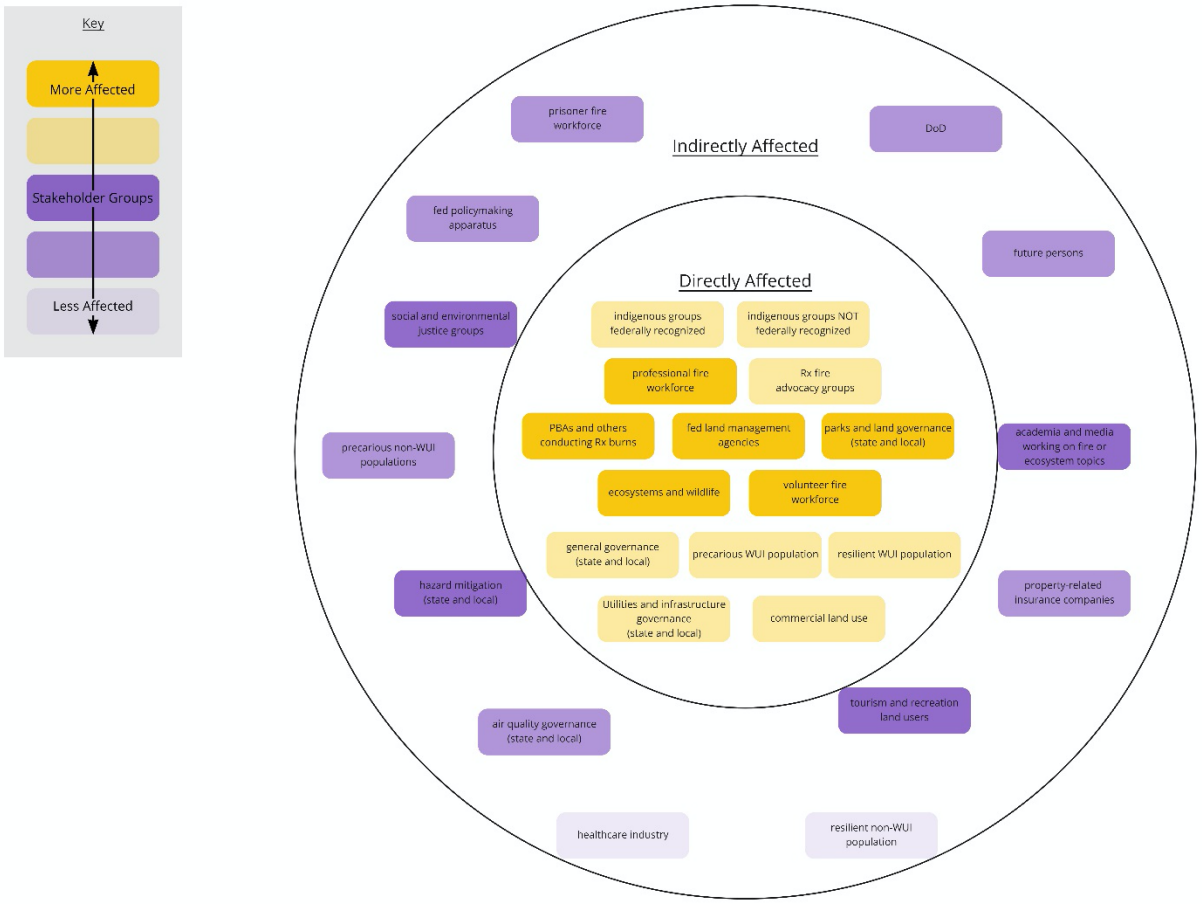
Note: the source for this CLD described racial disparities in health as driven by the poverty rate and trust of physicians across racial groups.

Define the context of impact

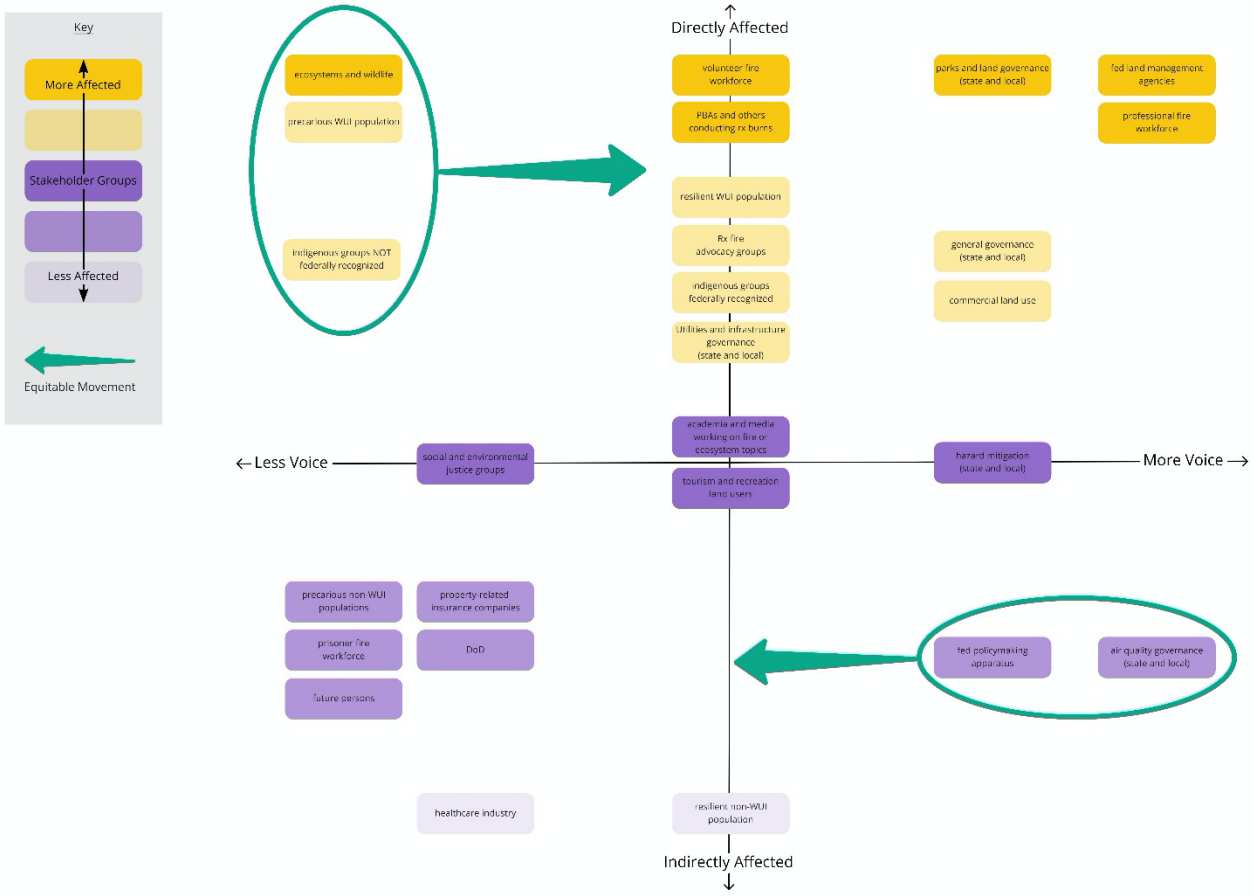
- Create an initial mapping of the affected groups
  - Tool: Mapping of who has internal and external standing
    - Refine stakeholder groups in partnership with the community
      - Seek out community self-definitions

[1] Obermeyer Z, Powers B, Vogeli C, Mullainathan S. 2019. Dissecting racial bias in an algorithm used to manage the health of populations. Science 366(6464):447-453. https://www.science.org/doi/10.1126/science.aax2342

- Example below from The Ethics and Equity of Prescribed Burns



- Tool: Equitable Movements 2x2
  - Example below from The Ethics and Equity of Prescribed Burns



- Tool: Stakeholder Functionality Matrix
  - Purpose: Identify areas of disproportionate ownership or access
  - Example below

	Students	Teachers	Admin	Parents	Companies	LEO	Neighbor-hoods	Cities	States
Lesson plan development	T	T,U,A,O	A	---	A	---	---	---	---
Lesson plan delivery	U	T,U,A,O	---	---	A	---	---	---	---
Testing	U	T,U,A	U,A	L	A	---	---	L	L
Grades	L	U,A	A	L	A	---	---	L	L
Student records	T	U,A	U, A	L	A	---	---	L	L
Surveillance	T	T,U	A	---	O	---	---	L	---
Threat id	T	U	A	---	O	L	---	L	---
Cheating	T	U	A	---	O	---	---	---	---

T=targeted U=used by A=access L=limited access O=ownership

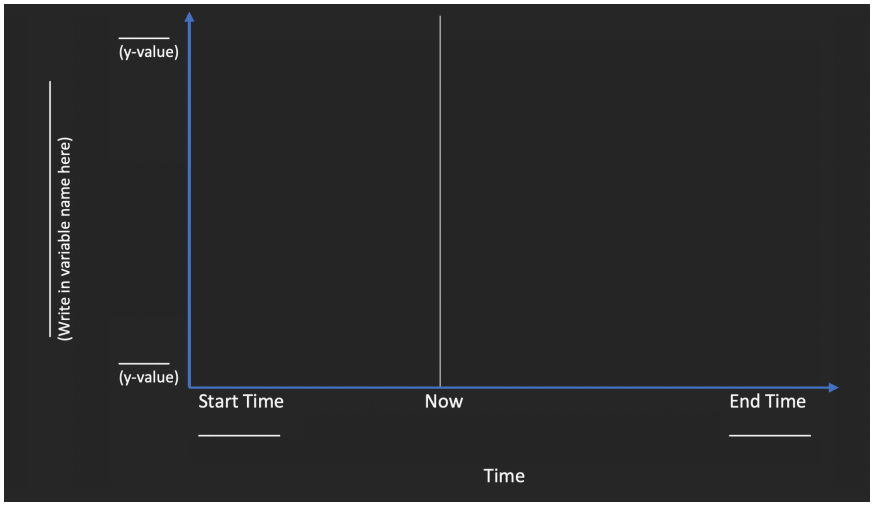
- Tool: Rigorously Interpreted Quotation Analysis
  - Create and validate CLDs from conversations with community partners
  - See Tomoaia-Cotisel *et al., Rigorously interpreted quotation analysis for evaluating causal loop diagrams in late-stage conceptualization*, 2022Here is a brief example from that paper:

Quotation	Interpretation	
CL04-30) "If I send out a note to call this patient … sometimes I will go back and look … days later and no one's called them. That worries me quite a bit. "Sometimes I feel like I do more things than I probably should just because I would just rather just do it myself and get it done correctly… I try and stick with basic things for the [clinical staff members] to do and if [it is at all] complicated … then I just do it… "I guess I can mostly rely on people but some things I don't trust them with and I would rather just do it myself." (110/188)	**Phrases**	**CLD Elements**
	• no one's called them	Clinical staff member capabilities
	• That worries me quite a bit • I would just rather just do it myself and get it done correctly • I guess I can mostly rely on people but some things I don't trust them with • just do it myself	Clinician and clinical staff member relationship (trust)
	• If I send out a note to call this patient • I do more things than I probably should • stick with basic things for the [clinical staff members] to do and if [it is at all] complicated … then I just do it • just do it myself	Task shifting to clinical staff members
	Causal Chain	
	Clinical staff member capabilities →+ Clinician and clinical staff member relationship (trust)→+ Task Shifting to clinical staff members	
	Coder's Interpretive Notes	
	The clinician makes the decision to shift tasks by considering how much they trust clinical staff members. When clinical staff member performance on assigned tasks is poor, then trust is low. There is a basic level of tasks that clinical staff members can do which do not require the clinician's trust.	

- Identify impacts on the community
  - Tool: Impact Assessment
    - Assess for the following impacts
      - See EI/EX in Technology Design for more info (available outside of RAND by emailing the PIs listed above).
    - **Adoption**
      - Availability – Does the design or marketing of a technology result in unintentional "gatekeeping" due to things like gaps in awareness, physical inaccessibility, or reliance on other technologies?
      - Cost – Does using the technology impose a relatively higher burden on certain groups?
      - Performance – Are there disparities in how well the technology functions that tend to affect some groups more than others, such as due to poor internet quality or differences in prior knowledge?
    - **Participation**
      - Information asymmetries – Borrowing from the language of economics, does the design allow participants to see and grasp what they are giving away and how it will be used so that they

can provide truly informed consent? Can they reasonably understand or negotiate terms of use?
        - Identity & Privacy – Does the participant have awareness and control over what is collected about their digital and physical identities and how it can be used to target or influence them? Can these data be misused or exploited in ways that are harmful to the participant?
        - Ownership & Value Capture – Who has rights to content and data produced within or derived from participating in a technology? Are participants adequately compensated for the value they provide through participation?
        - Agency – Can participants express their true preferences and intentions through the technology? Does the design manipulate or leverage participant behaviors, or form dependencies they would not otherwise choose?
        - Antipatterns – Are there ways that a design can be used or exploited by participants in unintended ways that are harmful to themselves or other stakeholders?
    - **Spillovers**
        - Side effects – How does the design and use of the technology affect people in the immediate term outside of the intended functionality? Is there a disruption to related activities? Does it produce new burdens or costs on others? What other technologies are displaced? How are surrounding people affected by these changes?
        - Longitudinal effects – How does the technology impact people and their environment over the long term if it is successfully adopted? As stakeholders adapt and reshape their behavior, what benefits and burdens emerge and for whom?
- Tool: Tetrad of Media Effects
    - **Enhances** What existing medium, practice, or capability does it amplify or extend?
    - **Obsolesces** What is likely to be made irrelevant or replaceable?
    - **Retrieves** Does the technology recall or restore some practice or behavior that had previously become obsolete?
    - **Reverses** If overdone or taken to an extreme, how might people push back or regress to find relief?
- Tool: Speculative Futures
    - Identify multiple alternative futures using worldbuilding to elicit dialog around values
- Tool: Hopes & Fears Graphs Over Time
    - What is the concerning past trend?
    - What are the hopes & fears for the future trend? Identify multiple alternative futures using behavior over time graphs to elicit dialog around potential futures and how they could come about

- For guidance on building them see Richardson & Andersen, *Scriptapedia/Graphs Over Time*, 2019



- Tool: Leverage Points
  - Identify places for improvement to make the technology more equitable
  - See Meadows Donella, *Leverage Points: Places to Intervene in a System*, 1997 for more information for a range of types of places/ways to intervene

Make the outputs sustainable

- Consider what the community owns after the project is over.
- How can the project build local capacity?
  - Make this process a routine part of transparency and accountability
- Tool: Develop a "logic model" of intended impacts, threats, and benefits as a rubric for ongoing evaluative research and design iteration.
  - Revisit baseline metrics from the framing to compare changes over time.
  - See Greenfield *et al., The Role of Logic Modeling in a Collaborative and Iterative Research Process* (2016) for guidance on logic model creation
- Tool: Build on the information visualized in the Logic Model by visualizing information feedback (and identifying each feedback process as reinforcing or balancing)
  - Feedback processes can be visualized in a CLD for example (see earlier guidance for the creation of CLDs)Revisit baseline metrics and graphs over time to compare to hopes and fears. CLDs help to build shared understanding and suggest adaptations to undesired/feared situations.