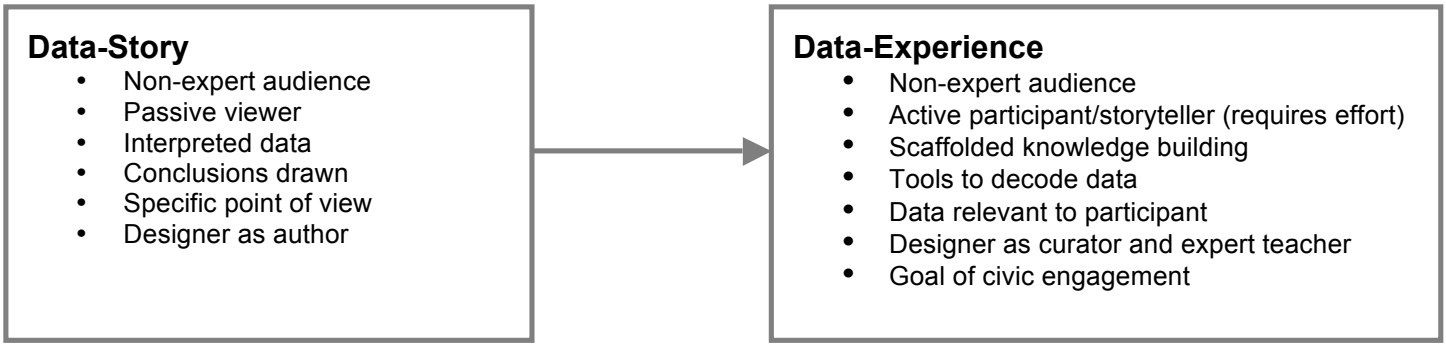
Approaching Data Visualization as Data Experience



Data-experience ➔ civic engagement
Civic engagement requires an individual to direct his or her attention and/or actions to issues/ concerns that have a direct impact on the community.

Civic engagement requires that the participant:

- Is aware of the issue/concern
- Feels connected to this issue/concern
    - The data is relevant (a connection to the self or past experience)
    - The participant feels ownership over the data/knowledge
- The participant is motivated (accomplishable goals, curiosity, etc.)
- The participant has opportunity to act and get feedback about those actions
    - Challenges that meet skills and knowledge
    - Knowledge of what actions to take
    - Feedback about progress in an action or toward a goal

Data-experience = co-authorship
A data-experience project requires the designer to abstain from drawing conclusions about datasets for the participant. Instead the designer must create activities and challenges that build a participant's knowledge and understanding about the data (and its context) and guide participants to interpret data and to take actions based on those interpretations.

The designer is responsible for:

- Filters that hide irrelevant data and illuminate patterns
- Activities/challenges that build on previous activities and knowledge to build new knowledge
- Data that is relevant to the participant (perhaps contributed by the participant).
- Tools that anticipate participant driven data (which requires expertise in the data genre)
- Structure that guides participants through knowledge acquisition, data interpretation, and real world action

The participant is responsible for (the):

- Honest data contributions
- Brain cycles required to learn something new
- Narrative about the data that is shared with friends/family
- Resources required to make a difference in the community (refer to Fogg's measures of simplicity)

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Working Example of Data-Experience Design Method

Data Mobilization Topic: CO_2 Emissions in New York City.[1]

Data Entry Point	Data Usability	Data Filters	Data Survey	Feedback Loop
CO_2 Emissions generated from parking. Participants will collect data about their car model, year, and the neighborhood they usually park in, the amount of time it takes to park and the time of day.	Measurements will be given in units familiar to participants like 2 Liter bottles of CO_2 and gasoline costs.	Data can be filtered by self, neighborhood, borough, and city.	Participants will be asked what their commitment level is to the environment and what resources they are willing to expend	A dashboard helps participants monitor their average emissions compared to others. The system poses small challenges to reduce individual contributions.

Data Challenge #1a Upload parking data for a one week period (requires 7 different days).	**Data Challenge #1b** Identify a factor that may influence parking time (that the participant may or may not have control over).
Feedback Progress towards the goal of 7 days of data is shown	**Feedback** System adds filter the participant requests (like time) and also shows comparative statistics related to that filter.

Data Challenge #2 Based on 1b, choose an action to take for the week, related to the identified factor to reduce emissions by a defined amount.	**Transference Action** Participant uses Spotswitch[2] (a mobile phone network that uses GPS to notify users where parking spots are available) for one week and collects parking data.	Findings that are positive may lead to challenging the participant to get another person involved. If findings are negative suggest a new action.
Feedback System keeps goal visible, shows progress, and makes suggestions to meet goal	**Feedback** Compare Spotswitch parking times with those of the prior week. Show progress towards 7 data entries. If emissions are not reducing, suggest other variables to look at. Calculate impact same action would have if others also participated.	

Mini Data Challenges Offer ongoing small actions, that can be self-reported, that make a difference like taking public transportation to a neighborhood where it takes a particularly long time to park or convincing a friend to participate too.
Feedback Calculate emissions saved by the action. Provide a running total of emissions prevented (both individual and within the project community).

Data Challenge #3 Offer filters to explore the impact of parking laws on finding parking spots. Pose the challenge to find the optimal rules for the participant's neighborhood	**Transference Action** Offer participant's actions like writing to local representative.
Feedback System keeps track of how many different scenarios the participant has explored. The system provides prompting questions about things to consider.	**Feedback** Calculate potential impact of law change. Identify goal and track completion of goal.

Data Challenge #4	**Transference Action**
Feedback	**Feedback**

[1] This example is based on an in-progress project, Polluting While Parking, in collaboration with Dr. Alessandra Leri.
[2] http://spotswitch.com/SSWeb/mobile.aspx