

# Designing Visualizations



*"The client kept changing the requirements on a daily basis, so we decided to freeze them until the next release."*

# Designing Visualizations

- design: creating something new to solve a problem
- find the user & tasks; then get and understand their data
- nested model captures design decisions that you make
- design activity framework can help guide you through a problem-driven visualization design process

# Design Activities

- a design activity is collectively working towards specific artifacts
- framework has four main activities

***U*nderstand**

*artifacts:* design requirements

***i*deate**

*artifacts:* ideas

***m*ake**

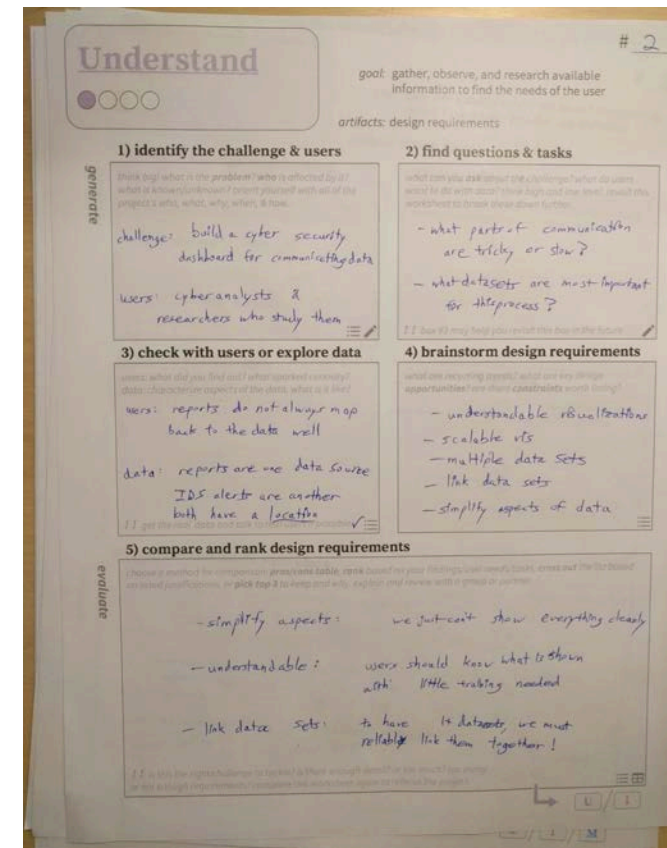
*artifacts:* prototypes

***d*eploy**

*artifacts:* visualization system

# Design Activity Worksheets

guided methods for obtaining artifacts



# Understand Worksheet: Cyber Security

## 1. identify the challenge & users

- challenge: build a cyber security dashboard for communicating data
- users: cyber analysts and researchers who study them
- didn't expand to more users (e.g. managers) until later in the project – this is okay! sometimes you don't know everything from the start

# Understand Worksheet: Cyber Security

## 2. find questions and tasks

- what parts of communication are tricky or slow currently?
- what datasets are more important for this process?
- what are kinds of patterns that analysts can find or cannot easily find?
- *later:* who do users need to communicate with?

# Understand Worksheet: Cyber Security

## 3. check with users or explore data

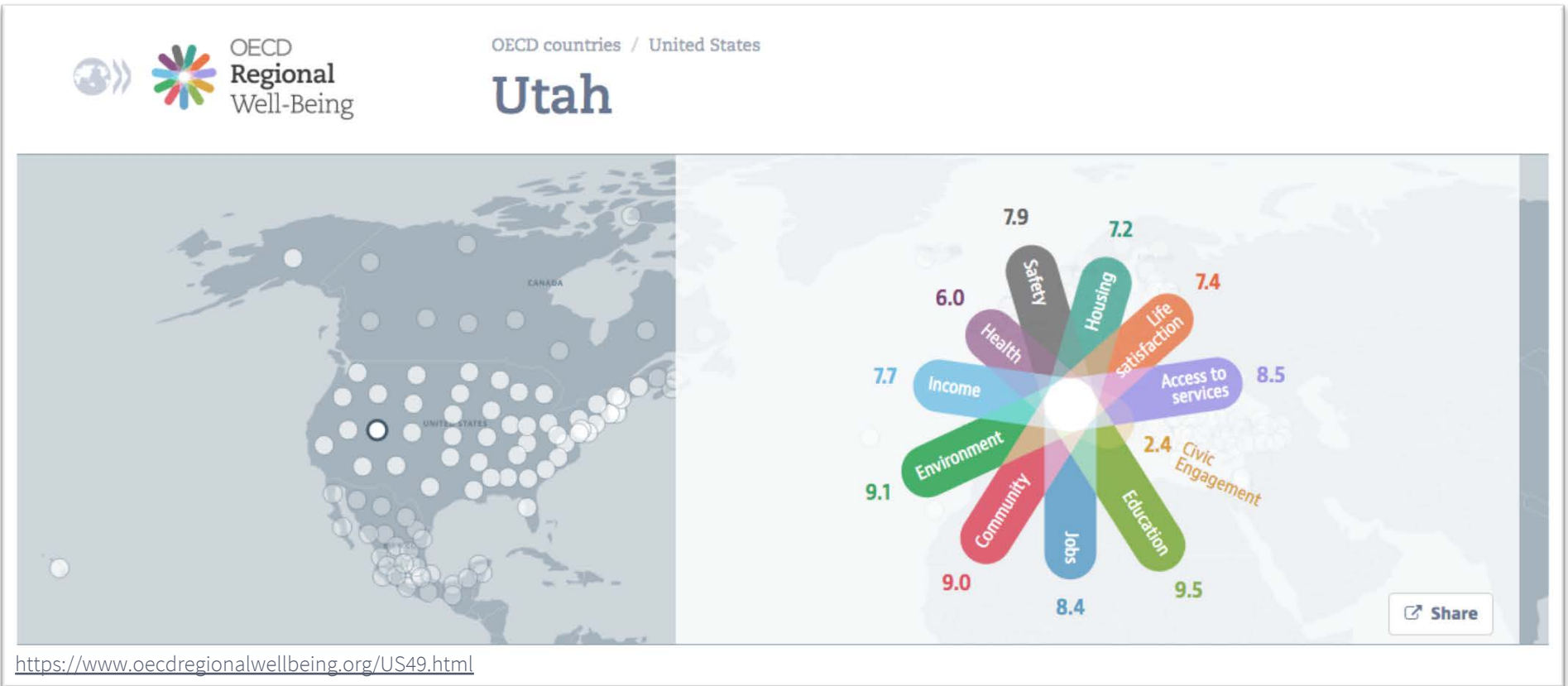
- here you must talk, observe, or research about the users as well as get access to data and explore it to understand all its nuances
- users: reports do not always map back to the data well
- data: reports are a separate data source and IDS alerts are another common data source

# Understand Worksheet: Cyber Security

4. brainstorm design requirements
  - **understandable** data visualizations
  - scalable visualizations to large datasets
  - multiple datasets can be shown at once
  - **linking** between datasets across views
  - **simplify aspects of the data** to show more at once



# Redesign Exercise



# Redesign Exercise

- find a partner and open: <https://www.oecdregionalwellbeing.org/>
- comprehend and discuss all of the views with your partner
- work separately on either the top or bottom views
  - **Understand** activity: boxes **1, 2, & 4** (*1-3 design requirements*)
  - **Ideate** activity: boxes **1, 2, & 3** (*sketch 2 new ideas*)
- walk through your work with a partner and evaluate ideas: box 5

# Redesign Sample Solution: Understand

## 1. identify the challenge & users

- selected the top view: region selection & overview
- challenge: convey and compare a complex, multidimensional view of the well-being or quality of life for a selected region of the world
- users:
  - curious resident of an area – find out what is scored well, and not, for their home
  - concerned citizen, or politician, looking for ways to improve a region's quality of life
  - sociologist to compare the well-being in different regions and parts of the world

# Redesign Sample Solution: Understand

## 2. find questions & tasks

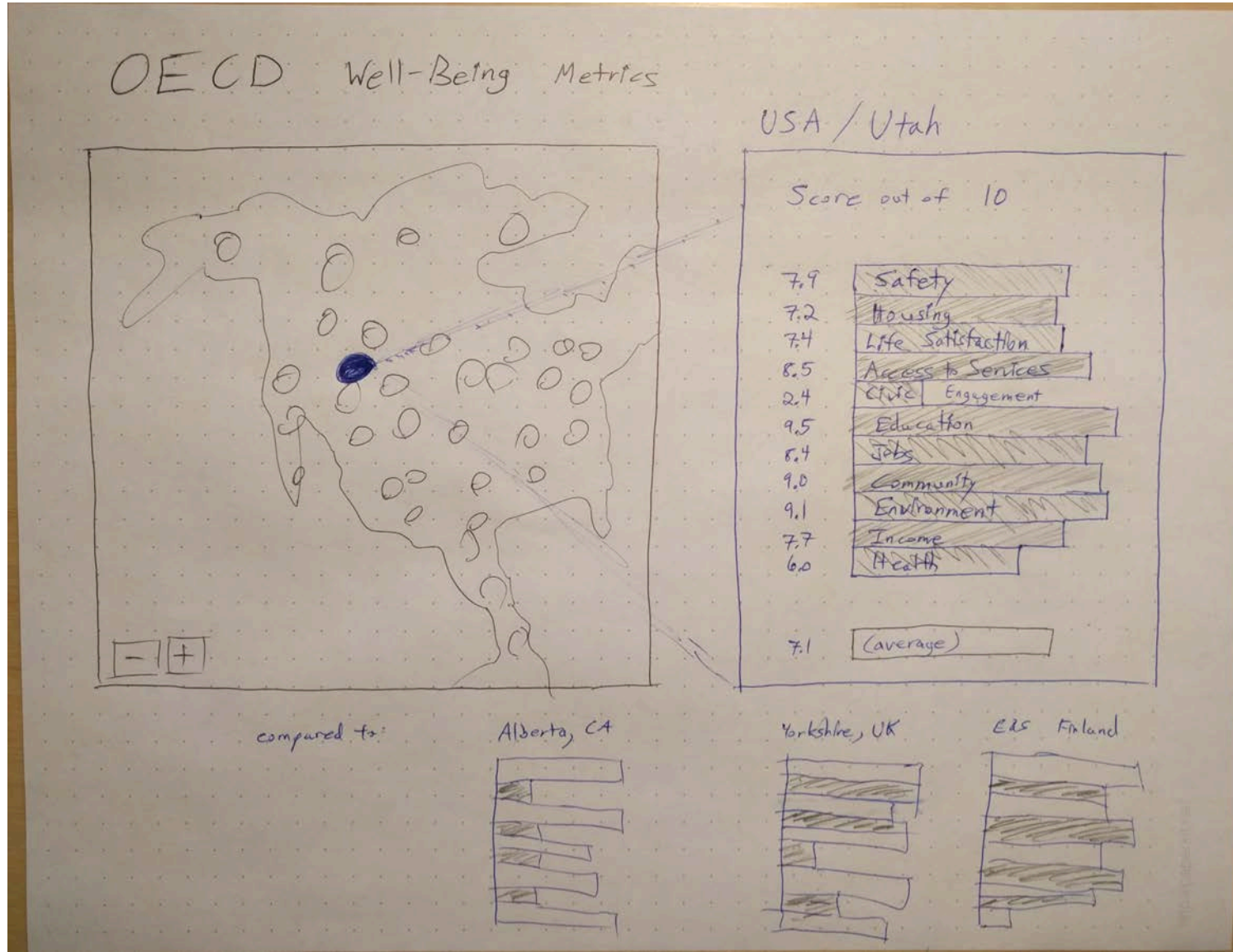
- what are the scores of my home region?
- how is my home region compared to the rest of the world?
- what is a good score or bad score? what areas can be improved?
- who can we look to for modeling behavior after in these weaker areas?

# Redesign Sample Solution: Understand

## 4. brainstorm design requirements

- *locate and find a home or desired region*
- **simplify reading data values for the metrics precisely**
- distinguish easily between the different metrics
- compare data values across the metrics and to other regions
- *find and compare selected region to similar ones*
- compare performance of these metrics, hierarchically and across the world
- find regions with very different metrics, or different to low-ranking ones

# Redesign Sample Solution: Ideate



# Design Activity Worksheets

- they will be sent out to the class
- encourage groups to use them as you form your proposals and progress towards the project milestone
- remember you can sign up for me to advise your group!