

Breakout Rooms - Exercises

Commute

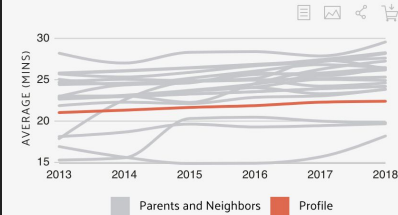
Commute Time

22.5 minutes

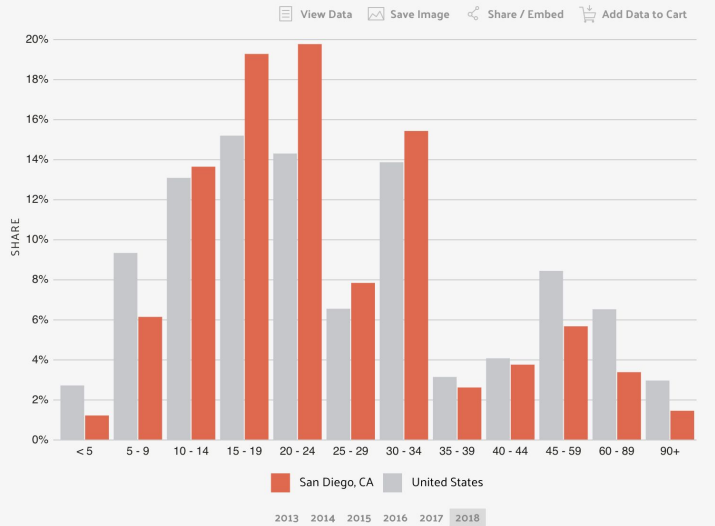
AVERAGE TRAVEL TIME

Using averages, employees in San Diego, CA have a shorter commute time (22.5 minutes) than the normal US worker (25.7 minutes). Additionally, 1.44% of the workforce in San Diego, CA have "super commutes" in excess of 90 minutes.

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Commuter Transportation

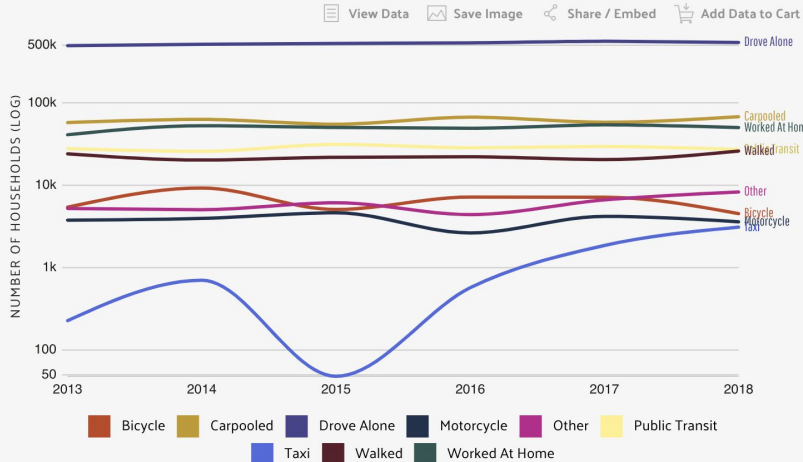
MOST COMMON METHOD OF TRAVEL

1. Drove Alone
73.9%
2. Carpooled
9.28%
3. Worked At Home
6.84%

In 2018, the most common method of travel for workers in San Diego, CA was Drove Alone (73.9%), followed by those who Carpooled (9.28%) and those who Worked At Home (6.84%).

The following chart shows the number of households using each mode of transportation over time, using a logarithmic scale on the y-axis to help better show variations in the smaller means of commuting.

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Rent vs Own

46.8%

2018 HOMEOWNERSHIP

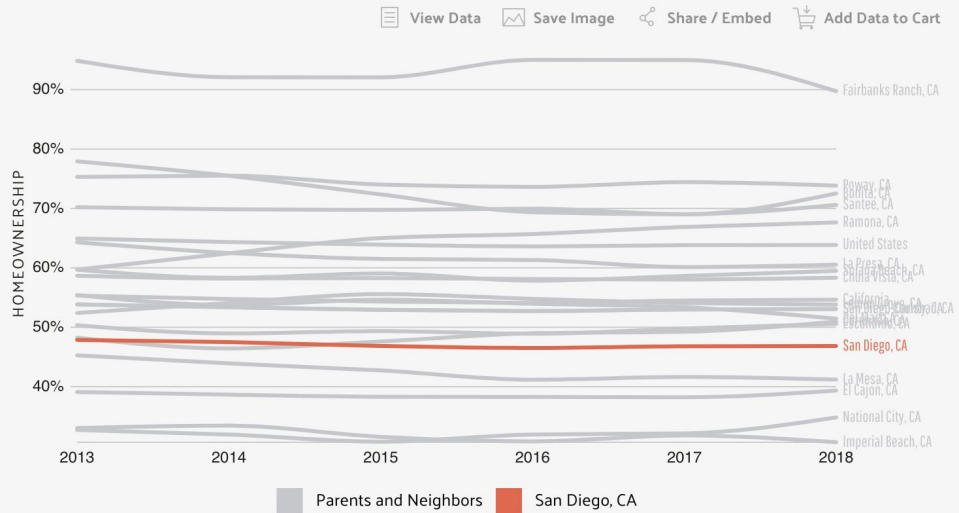
47.1%

2017 HOMEOWNERSHIP

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This percentage of owner-occupation is lower than the national average of 63.9%. This chart shows the ownership percentage in San Diego, CA compared it's parent and neighboring geographies.

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Property Value

Property Value

\$654,700

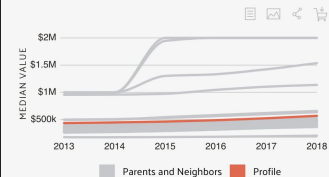
2018 MEDIAN
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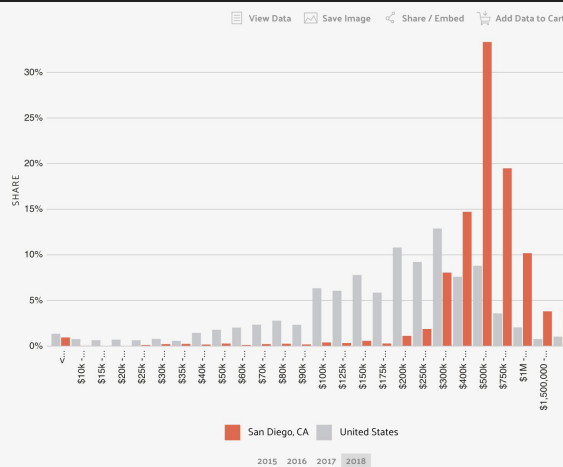
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Foreign-Born Population Demographics

25.8%

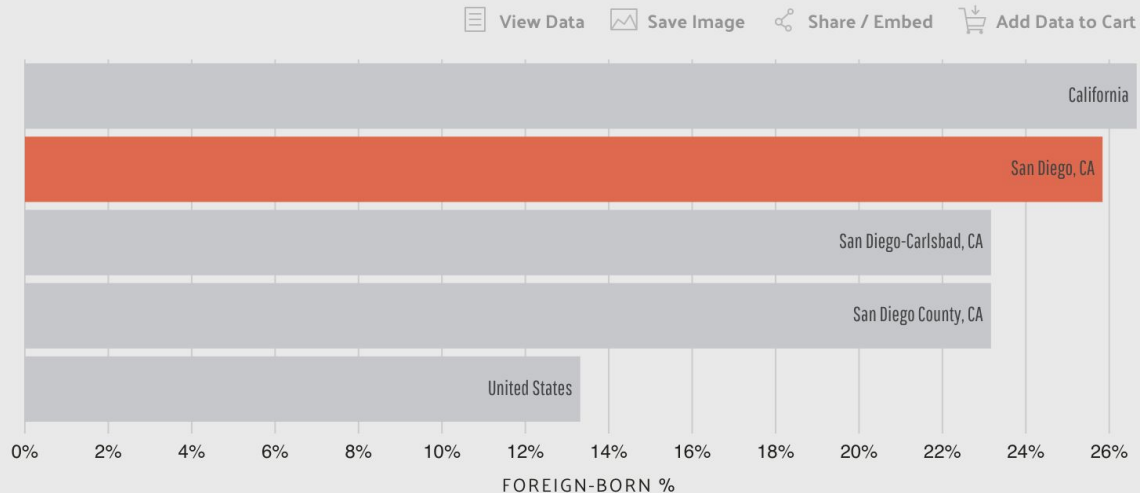
2018 FOREIGN-BORN POPULATION
368k people

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2017 FOREIGN-BORN POPULATION
367k people

As of 2018, 25.8% of San Diego, CA residents (368k people) were born outside of the United States, which is higher than the national average of 13.7%. In 2017, the percentage of foreign-born citizens in San Diego, CA was 25.8%, meaning that the rate has been increasing.

The following chart shows the percentage of foreign-born residents in San Diego, CA compared to that of its neighboring and parent geographies.



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Non-English Speakers

MOST COMMON LANGUAGES

- Spanish
308,066 speakers (23%)
- Tagalog (Incl. Filipino)
49,095 speakers (3.67%)
- Chinese (Incl. Mandarin, Cantonese)
37,341 speakers (2.79%)

41.4% of San Diego, CA citizens are speakers of a non-English language, which is higher than the national average of 21.9%. In 2018, the most common non-English language spoken in San Diego, CA was Spanish. 23% of the overall population of San Diego, CA are native Spanish speakers. 3.67% speak Tagalog (Incl. Filipino) and 2.79% speak Spanish, the next two most common languages.

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Age by Nativity

31

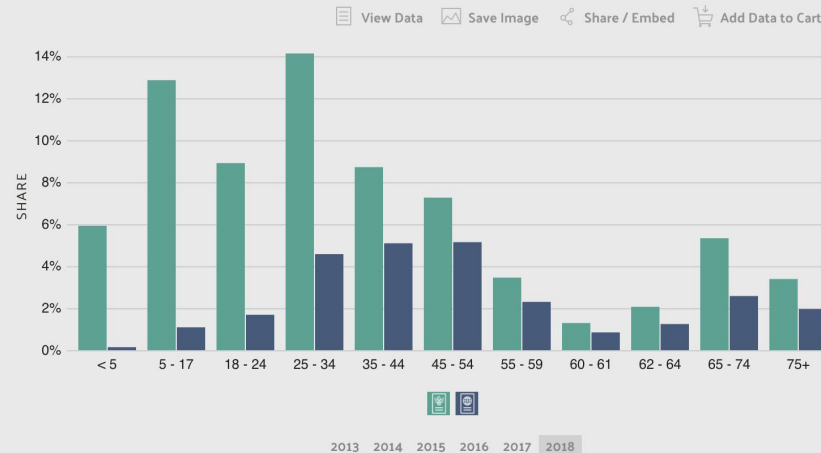
MEDIAN NATIVE-BORN AGE
± 0.5

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MEDIAN FOREIGN-BORN AGE
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In 2018, the median age of all people in San Diego, CA was 35.4. Native-born citizens, with a median age of 31, were generally younger than than foreign-born citizens, with a median age of 47. But people in San Diego, CA are getting older. In 2017, the average age of all San Diego, CA residents was 35.

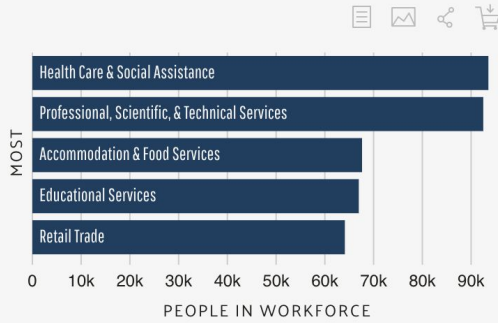
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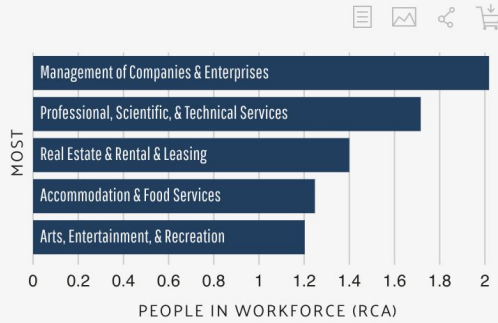
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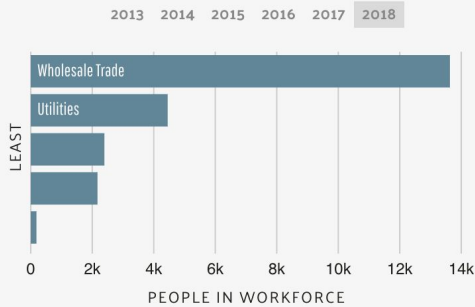
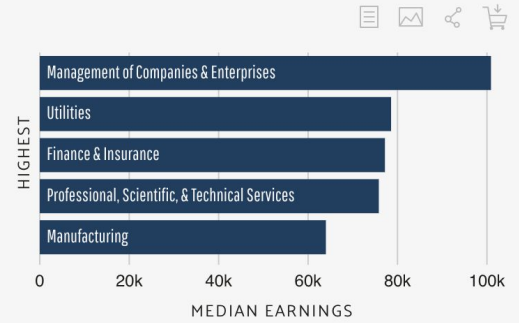
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Highest Paying

The highest paying industries in San Diego, CA, by median earnings, are Management of Companies & Enterprises (\$100,905), Utilities (\$78,567), and Finance & Insurance (\$77,186).



Scenario

Maria is an international student is considering San Diego, out of a number of US cities, for an MBA program in the US. She wants somewhere reasonably affordable and is only planning on being in the program for two years, but is looking for a place she could potentially stay and work after graduation. Maria doesn't have any connections in the United States and is looking for a place with a community.

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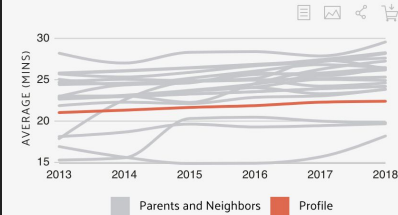
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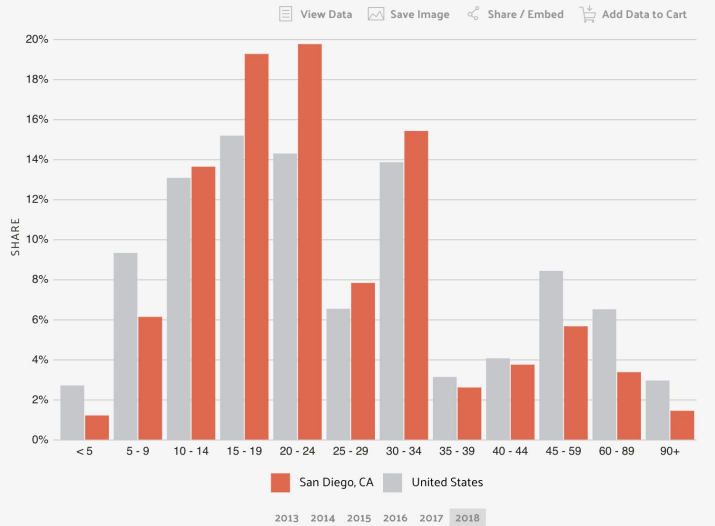
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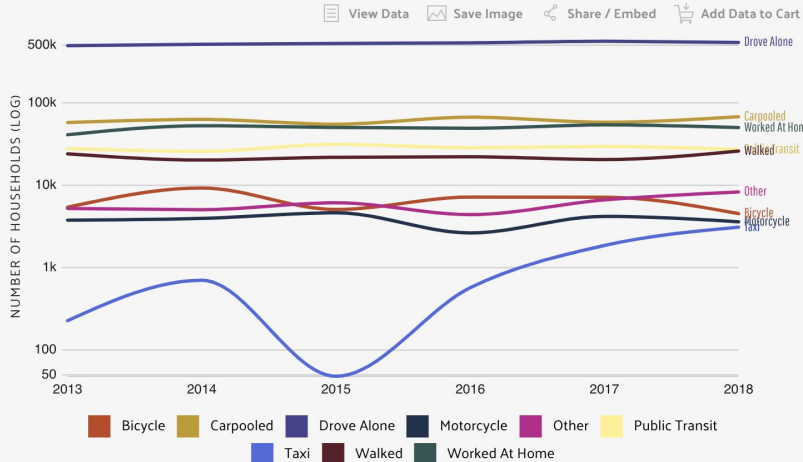
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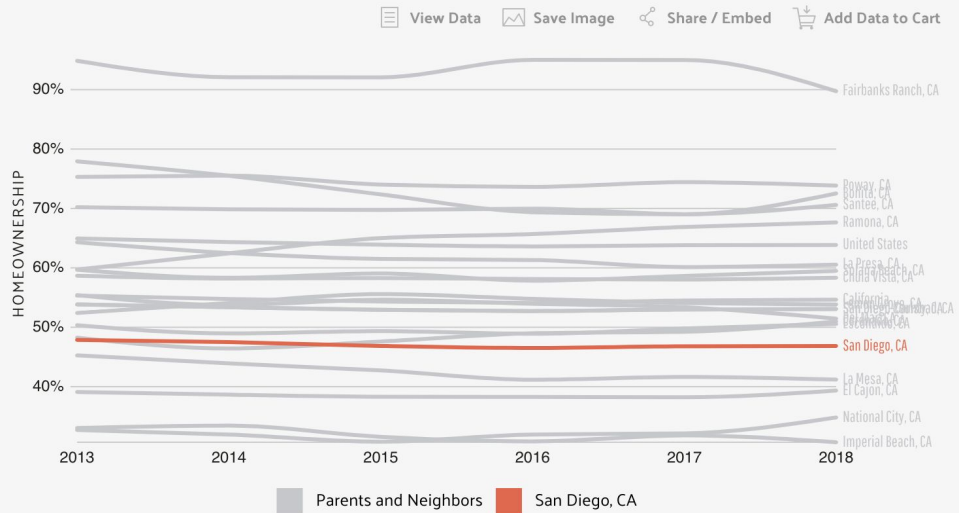
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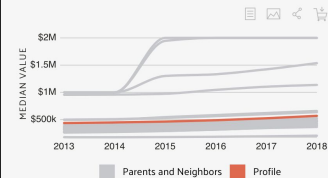
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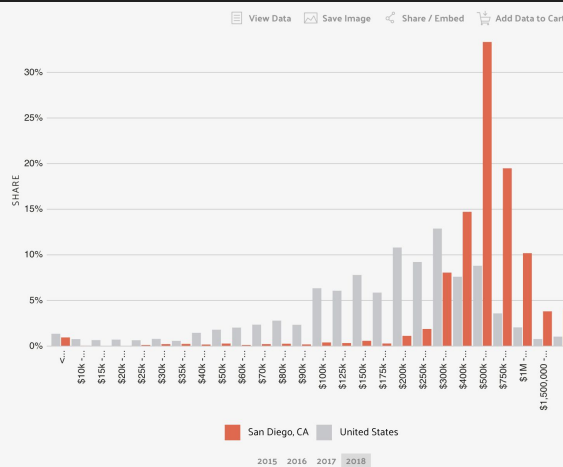
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Foreign-Born Population Demographics

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2018 FOREIGN-BORN POPULATION
368k people

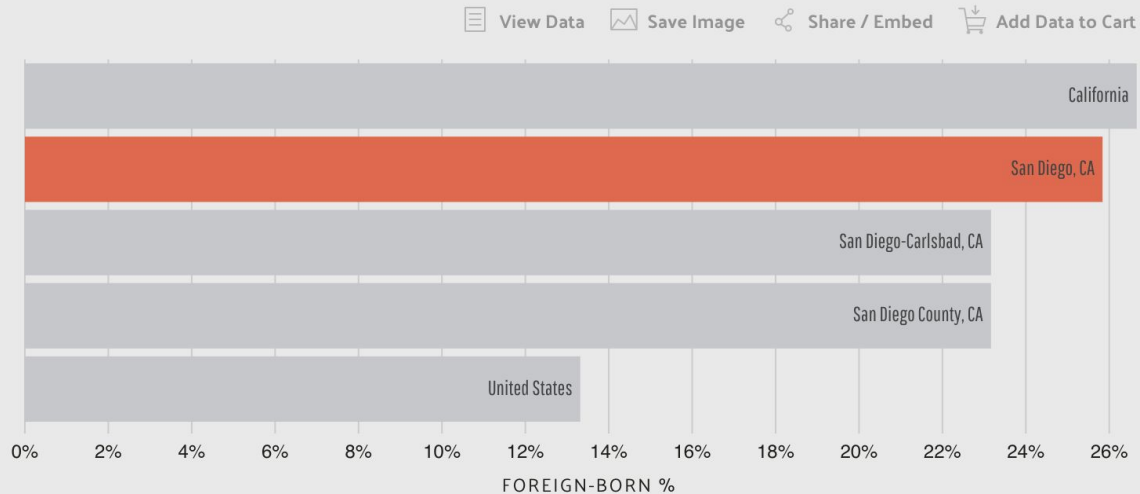
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37,341 speakers (2.79%)

41.4% of San Diego, CA citizens are speakers of a non-English language, which is higher than the national average of 21.9%. In 2018, the most common non-English language spoken in San Diego, CA was Spanish. 23% of the overall population of San Diego, CA are native Spanish speakers. 3.67% speak Tagalog (Incl. Filipino) and 2.79% speak Spanish, the next two most common languages.

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Age by Nativity

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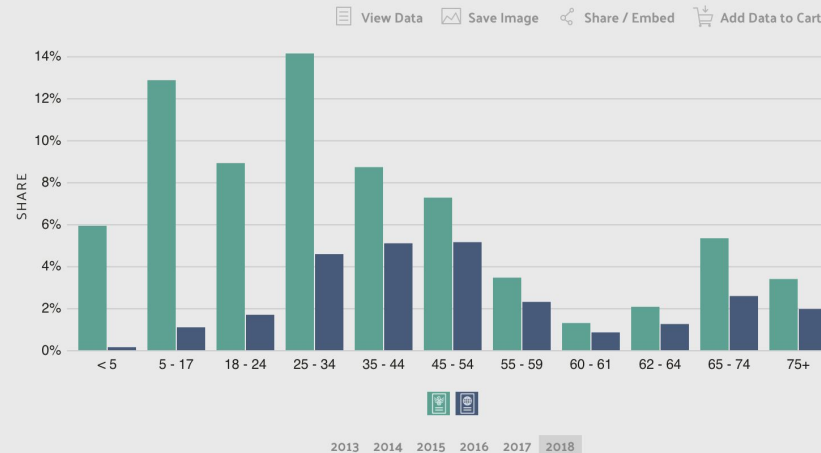
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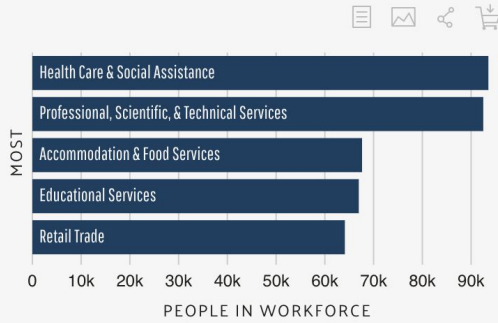
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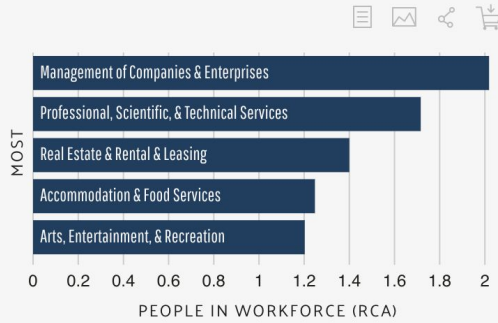
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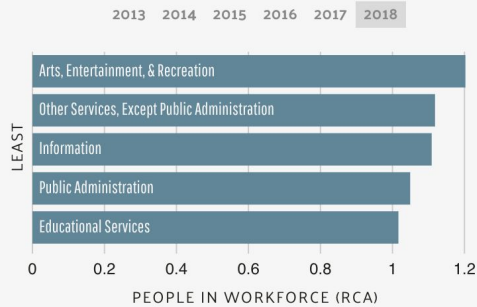
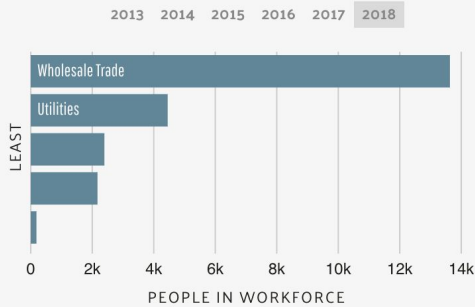
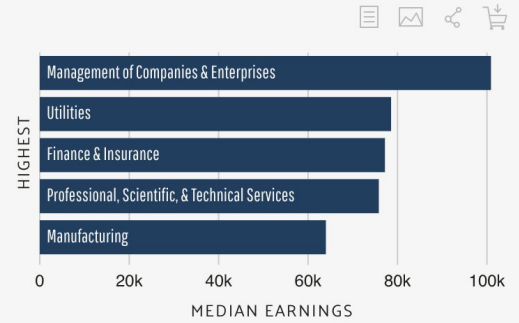
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Catherine is an older San Diego resident living alone who is debating to move to a new neighborhood in San Diego or elsewhere. She works as a nurse at the Scripps Memorial Hospital in the Health Care and Social Assistance industry. She has been renting an apartment the entire time she has been living in San Diego. If she moves within San Diego she can afford a condo but if she moves outside the area she can afford a house, however; her commute time will increase.

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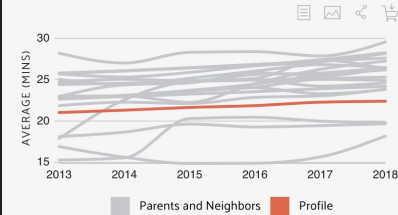
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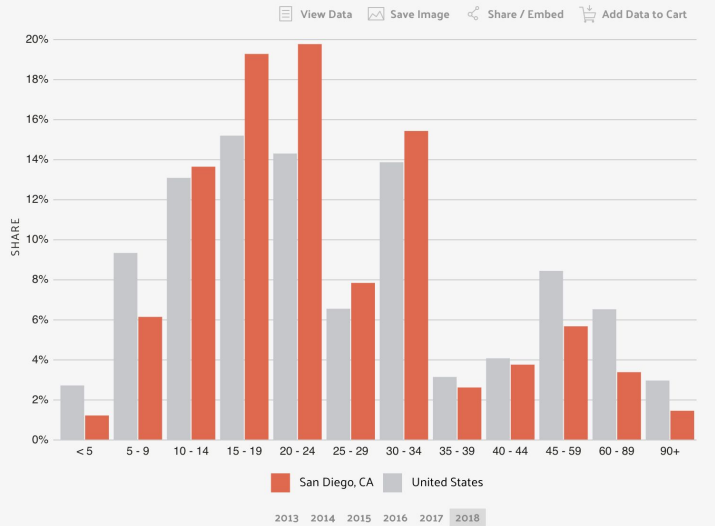
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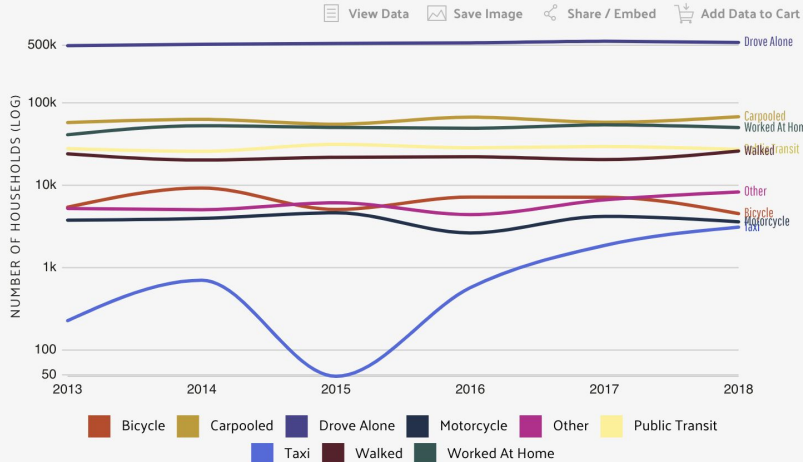
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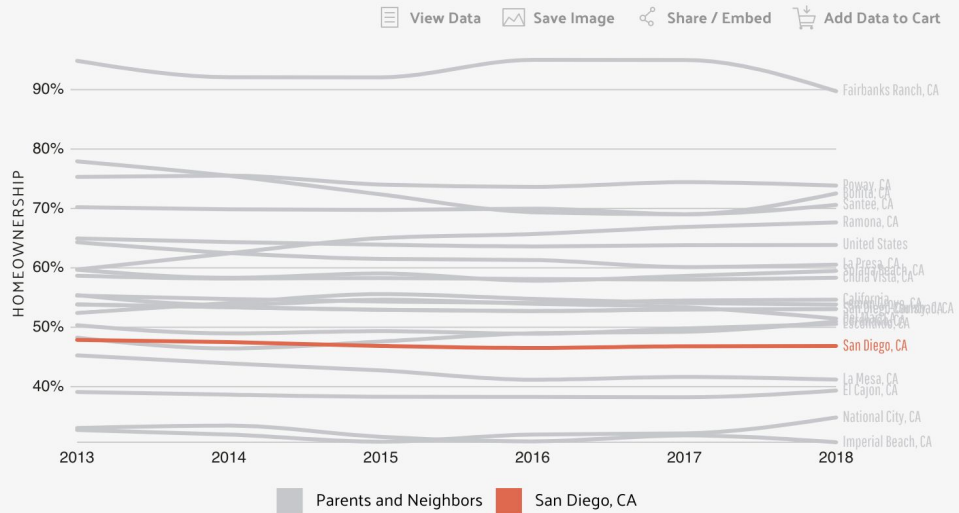
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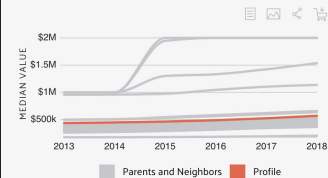
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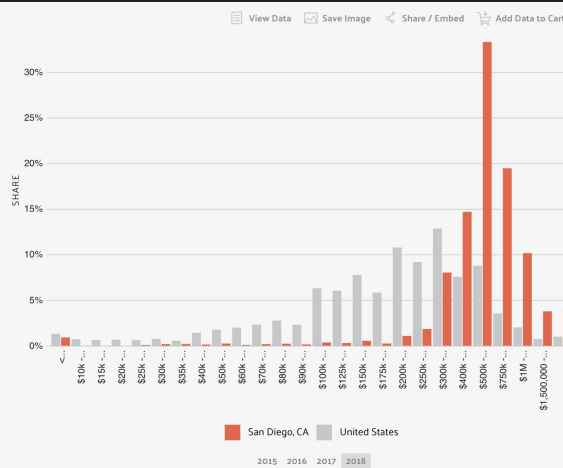
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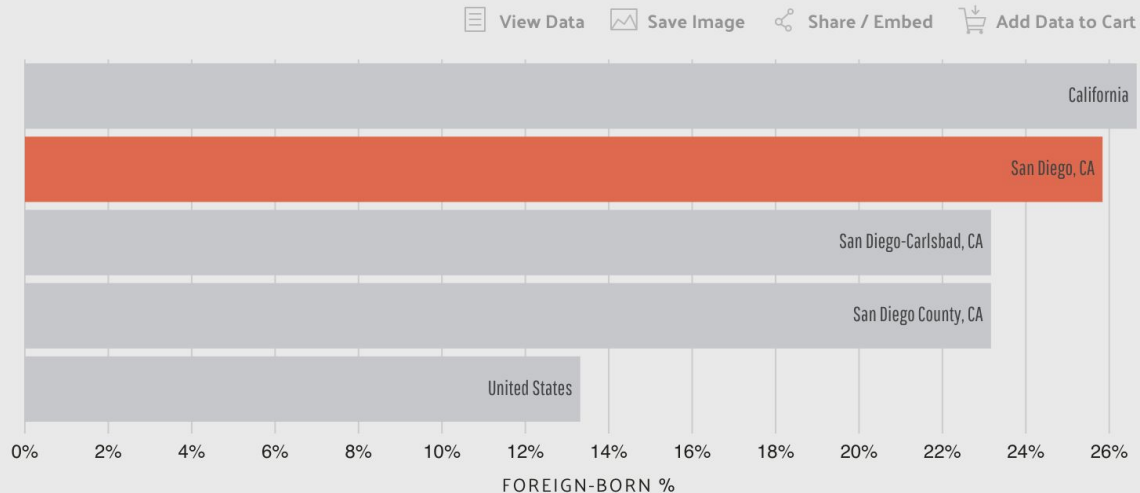
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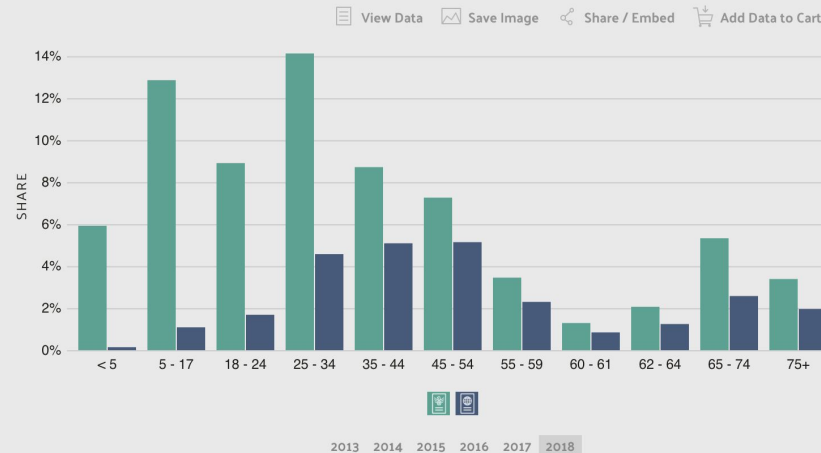
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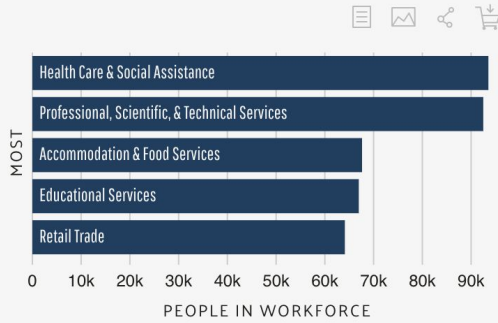
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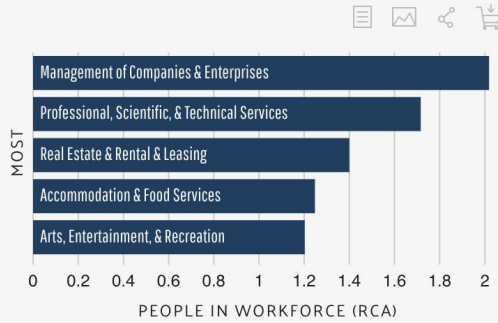
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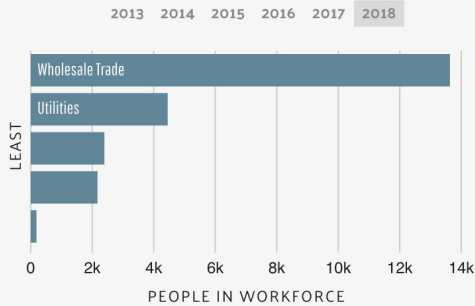
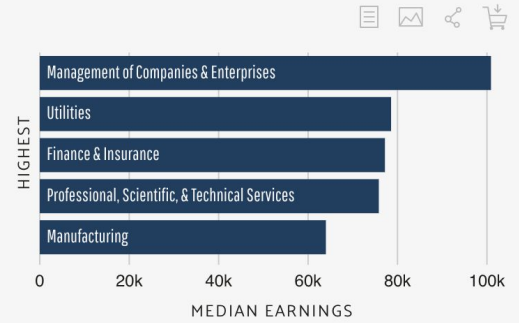
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Scenario

Ben is a middle aged small business owner with a bakery in Indianapolis. He wants to move somewhere new and is considering San Diego as an option. His current community is very walkable, and while he is open to a lifestyle change, he is still interested in some walkability. He's always been interested in real estate and plans to become a real estate agent after the move. He's also planning on buying his first home in the city.

Poll

1. What graphic(s) did you think was most important in making a decision?
 - a. Commute, work force, demographics, property value
2. What graphic(s) did you think was least important in making a decision?
 - a. Commute, work force, demographics, property value
3. Based on your group discussion, would you live in San Diego?

Scenarios

Scenario #1

Maria is an international student is considering San Diego, out of a number of US cities, for an MBA program in the US. She wants somewhere reasonably affordable and is only planning on being in the program for two years, but is looking for a place she could potentially stay and work after graduation. Maria doesn't have any connections in the United States and is looking for a place with a community.

Scenario #2

Catherine is an older San Diego resident living alone who is debating to move to a new neighborhood in San Diego or elsewhere. She works as a nurse at the Scripps Memorial Hospital in the Health Care and Social Assistance industry. She has been renting an apartment the entire time she has been living in San Diego. If she moves within San Diego she can afford a condo but if she moves outside the area she can afford a house, however; her commute time will increase.

Scenario #3

Ben is a middle age small business owner with a bakery in Indianapolis. He wants to move somewhere new and is considering SD as an option. His current community is very walkable, and while he is open to a lifestyle change, he is still interested in some walkability. He's always been interested in real estate and plans to become a real estate agent after the move. He's also planning on buying his first home in the city.

Scenario Questions

1. After reading through the other scenario responses, how do you think the needs of the person influence the way data is interpreted?
2. How different do you think responses were within your own group?
3. Do you agree with the assessments other groups made?

Paper Presentation

Introduction

- Create visualizations of publicly available data where none exist
- Anticipate users' need of the data
- Create a data narrative

Motivation

- A lot of publicly available data exists that is under utilized
- Reduce barriers to entry
- Allow people unbiased access to factual information

Background

- Public knowledge of data, tools, and visualizations
 1. Current tools and analysis of tool literature: **LinkDaViz**
 2. Telling data tales made understandable through stories: **Datafication**
 3. Understanding the process to understand data: **Visual Narrative FLOW**

LinkDaViz – Automatic Binding of Linked Data to Visualizations

- There is a demand for data without the ability to read
- Visualizing data is the most rewarding and most challenging
- Data visualizations are inaccessible

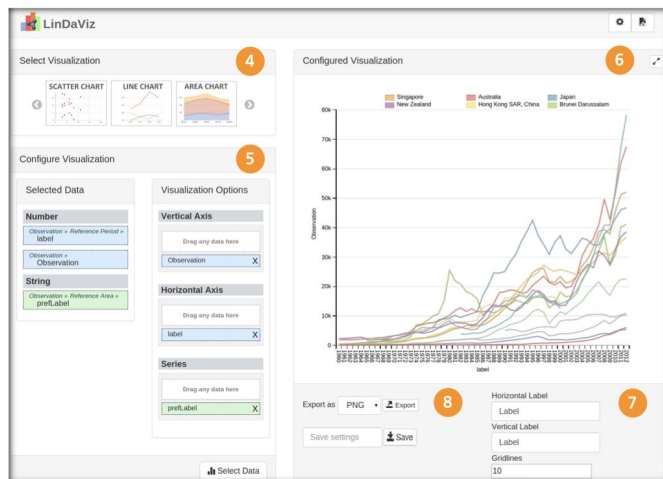


Fig. 7: LinkDaViz - visualize data: 4. Select recommended visualization. 5. Customize suggested configuration. 6. Visualize data. 7. Customize layout. 8. Save or export visualization.

What LinkDaViz provided

- Support of non-technical configuration
- Formal visualization model with structural and layout options
- Visualization recommendation algorithm with automatic binding of data properties to visualization parameters

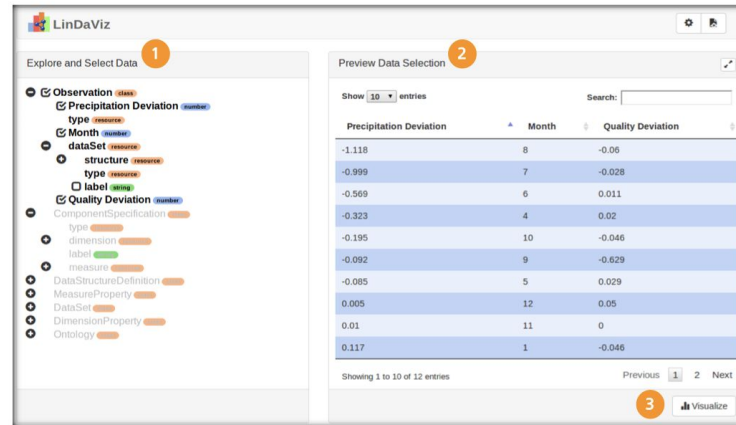
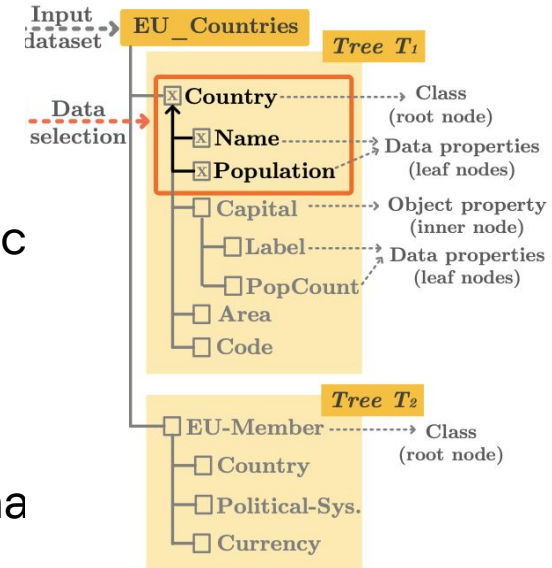
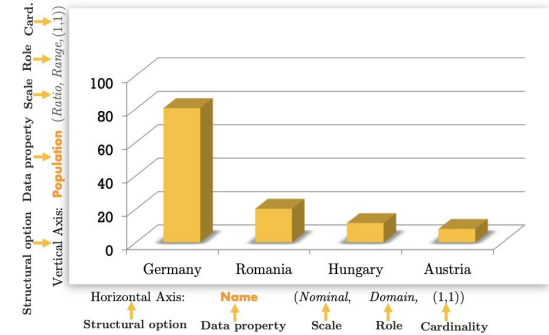


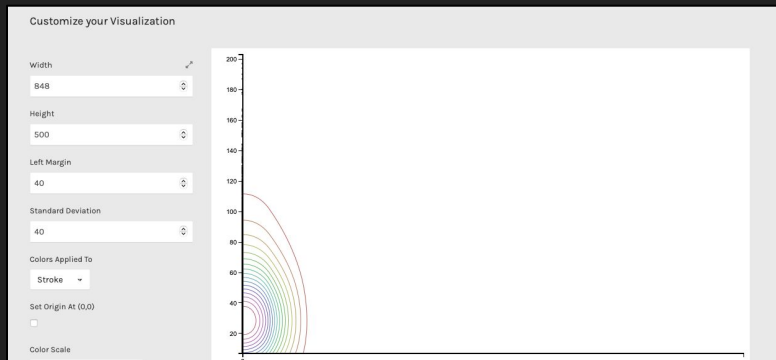
Fig. 6: LinkDaViz - select data: **1.** Browse and select data. **2.** Explore selection. **3.** Visualize selection.

LinkDaViz data representation

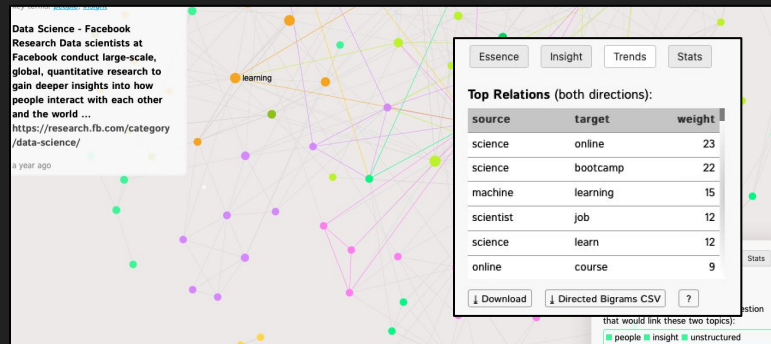
- Each dataset is represented in trees with a root corresponding to the RDF class with nodes and edges
 - $ds \in DS$
 - $T \in \text{Trees}(ds)$
 - $T = (V, E, r)$
 - $r \in V$
- The scales of measurement are divided into categoric and quantitative scales and are used to categorize
 - Hierarchy: Nominal \leftarrow Ordinal \leftarrow Interval \leftarrow Ratio
 - Nominal = most generic, ratio = most specific
 - Numbers = ratio, dates = interval, strings = nomina



Current online tools for the everyday person



RAWGraphs



InfraNodus

Tad - movie-grossByCountryDirector.tad

Pivot: country > director_name > movie_title

	gross	movie_imdb_link
	201,580,106...	
	178,619,254...	
	4,014,061,704	
Spielberg		http://www.imdb.com
E.T. the Extra-Terrestrial	434,949,459	http://www.imdb.com
Jurassic Park	356,784,000	http://www.imdb.com
Indiana Jones and the Kingdom of the Crystal...	317,011,114	http://www.imdb.com
Jaws	280,000,000	http://www.imdb.com
Raiders of the Lost Ark	242,374,454	http://www.imdb.com
War of the Worlds	234,277,056	http://www.imdb.com
The Lost World: Jurassic Park	229,074,524	http://www.imdb.com

Additional Properties

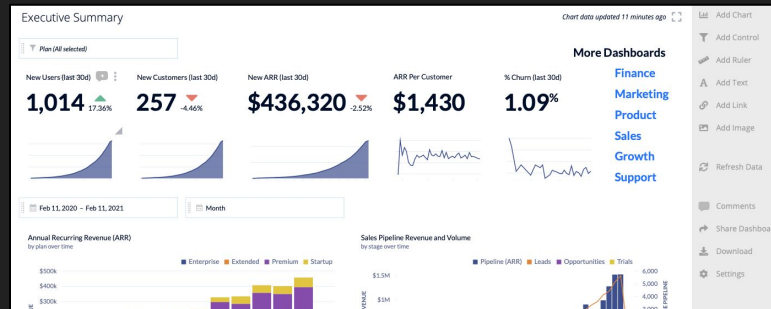
General

Order Pivot Sort Aggregations Format

Columns

Column	Show	Pivot	Sort
country	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
director_facebook_likes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
director_name	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

TadViewer



Chartio

The screenshot displays the LinDaViz application interface, divided into two main panels. The left panel, titled "Explore and Select Data" (marked with a '1'), shows a hierarchical tree of data classes and resources. The right panel, titled "Preview Data Selection" (marked with a '2'), shows a table of data entries with columns for "Precipitation Deviation", "Month", and "Quality Deviation". A "Visualize" button (marked with a '3') is located at the bottom right of the interface.

1. Explore and Select Data

- Observation (class)
 - Precipitation Deviation (number)
 - type (resource)
 - Month (number)
 - dataSet (resource)
 - structure (resource)
 - type (resource)
 - label (string)
 - Quality Deviation (number)
 - ComponentSpecification (resource)
 - type (resource)
 - dimension (resource)
 - label (string)
 - measure (resource)
 - DataStructureDefinition (resource)
 - MeasureProperty (resource)
 - DataSet (resource)
 - DimensionProperty (resource)
 - Ontology (resource)

2. Preview Data Selection

Show 10 entries Search:

Precipitation Deviation	Month	Quality Deviation
-1.118	8	-0.06
-0.999	7	-0.028
-0.569	6	0.011
-0.323	4	0.02
-0.195	10	-0.046
-0.092	9	-0.629
-0.085	5	0.029
0.005	12	0.05
0.01	11	0
0.117	1	-0.046

Showing 1 to 10 of 12 entries Previous 1 2 Next

3. Visualize

Fig. 6: LinkDaViz - select data: **1.** Browse and select data. **2.** Explore selection. **3.** Visualize selection.

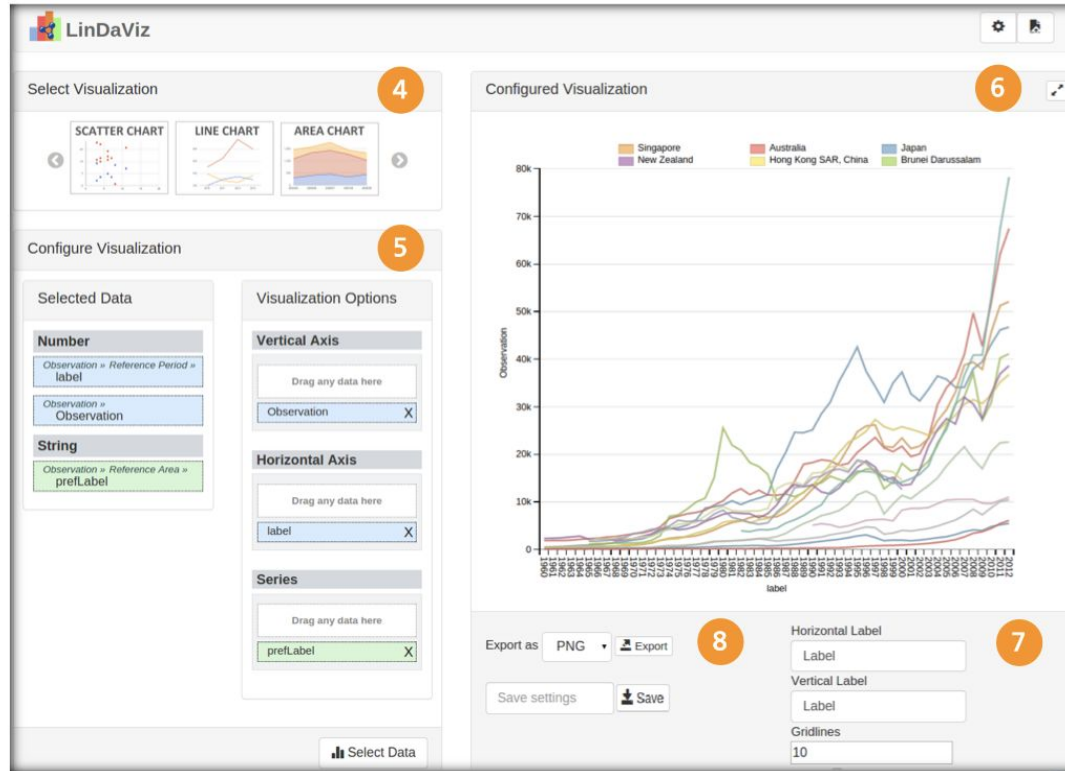


Fig. 7: LinkDaViz - visualize data: **4.** Select recommended visualization. **5.** Customize suggested configuration. **6.** Visualize data. **7.** Customize layout. **8.** Save or export visualization.

Clarifications

- LinkDaViz compared to our hypothesis with inputs and outputs

Datafication and data fiction: Narrating data and narrating with data

“the transformation of social action into online quantified data, thus allowing for real-time tracking and predictive analysis”

- Focusing not so much on the production of quantified data, but on the processes of symbolic and imaginative work that underlie coming to think of something as “data” in the first place

Ethnographic Perspective of interpreting data

- ethnography not only tells stories but *traces* them: analyzing the spread of ideas, expressions, attitudes, and ways of thinking through organizations, communities, and cultures.

Needing frames and references for sense-making of data

Data makes sense only to the extent that we have frames for making sense of it, and *the difference between a productive data analysis and a random-number generator is a narrative account* of the meaningfulness of their outputs

- Rather than see data as indexical—that is, as existing by dint of an actual relation to events or objects—we start to see them here as symbolic, and so as taking on meaning through processes of interpretation, “translation” and “framing”. The process of narration is one by which data is found to be meaningful
- Data has responsibilities: “a story it was compelled to say”

The context where you see the data is important as well:

media ideologies concerns the ways in which people make evaluations of the use of appropriateness of different communicative media for different social interactions

data ideologies are “culturally and socially inscribed beliefs about the appropriateness of data for certain communicative purposes.”

Narrative adds trajectory and a sense of time

Narrative begins to **add a structuring element and most especially a sequencing element to data**

- Narrating data reintroduces a notion of sequence and, with it, a notion of path, of movement, or of trajectory.
- Trajectory reflects the logic of equivalence in the sense of the way in which different elements, data items, or moments are interpreted as being aspects of a singular whole
- Just as stories are patterned and reflect narrative expectations, embody archetypes, and express conventions, so too do data interpretations. In other words, the character of data narratives here is not merely linear but teleological (i.e., purposive)

In this, then, **data narratives help to “fix” data temporally**. That is, the accounts that data narratives offer are ones that **make sense of data within an evolving context**, and so stabilize it in the sense that they situate it within a landscape of recognizable objects.

- This is not to suggest that the data becomes immutable or unchanging, but rather that it is rendered stable and accountable within the terms that a narrative offers; it may evolve and change but it does so within a stable frame.
- Data narratives help to stabilize data by shifting the temporal scale and giving data meaning even in advance of the inevitable arrival of new, unknown, and unknowable signals.

Why data narratives are important

- Want to be able to tell a story with the data
- Want the story the data tells to change based on the reader
- Data narratives allow the authors the ability to structure what the story can be while still allowing for exploration
- Want readers to experience insight
 - An experience
 - Something gained - understanding/knowledge
- Data narratives allow you to give new knowledge to the reader, while still letting them explore and have the experience of an insight.

Visual narrative flow

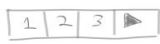
- There is still a story, but now new information and feedback are both presented visually
- The reader has control of how to move through the story
- (some) Information is presented visually to engage the reader in a new way
- The reader can also interact with the data visualizations and gain feedback of the effects of their actions
 - Changing variables, scales, etc.

Visual Narrative Flow: Exploring Factors Shaping Data Visualization Story Reading Experiences

- Visual narrative flow
 - The way a reader navigates the story
 - The visual components of the story
 - The visual feedback a reader receives

Visual Narrative Flow: Exploring Factors Shaping Data Visualization Story Reading Experiences

navigation input



button



scroll



slider

story layout



document



slideshow



hybrid

level of control



text



vis



transitions

over:



and how:



discrete



continuous



hybrid

role of visualization



equal



figure



annotated

story progression



linear



linear skip



tree/graph

navigation progress



text



dots



vis

navigation feedback



text



vis



widget

Visual Narrative Flow: Exploring Factors Shaping Data Visualization Story Reading Experiences

- Studied navigation input and reader experience
 - Explored stepper and scroller flows
- While usability and comprehension were the same across flows, people expressed different preferences in how they navigated through the story

Visual Narrative Flow: Exploring Factors Shaping Data Visualization Story Reading Experiences

- Study on reader engagement
 - Had participants read stories with (1) text only (2) text and static visualizations (3) text, visualizations, and animated transitions
- While level of engagement increased with visualizations, and even more so with animated transitions, there was no significant difference in comprehension.

**Breakout Rooms – paper
questions/prompts**

Questions:

LinkDaViz – Automatic Binding of Linked Data to Visualizations

1. Did you see any weaknesses with their method of selecting or displaying information?
2. How was this data visualization tool contribution similar to different to ones you have seen?
- 3. What is your usage of data visualizations?**
4. When you think of data visualization what does that mean? What do you picture?

Questions: Datafiction

- What are your media and data ideologies? How important is the platform or format you use to analyze data or look at results in how you think about the data? Do you think about a problem differently if you're using Excel vs SPSS vs R etc...?
- How much context do you think is necessary when providing data? When do you think historical context is needed? What makes some factors more important than others to take into consideration? What determines what background is "relevant"?

Questions: Visual Narrative

- The studies suggest that some of these flow factors don't have an impact on user performance, but that users display strong preferences for things like navigation input. Do you feel similarly? Do you have strong preferences about things like navigation input? Would a certain type of navigation input ever stop you from reading something?
- The paper shows that having more visualizations and dynamic interactions increases engagement with a story. How important do you think visualizations are to engagement? Is it really the most important/effective way to increase engagement or do you think there are other factors/things you've experienced that have a bigger impact on engagement?

Large group discussion

Research Proposal

Potential Plan

- Create a web-browser extension framework that reads pages when you prompt them to
- Searches for files of .csv, .json extension
- Prompts for
 - 1. What user is looking for in their data
 - 2. What experience level user has with data
 - 3. What user hopes to get out of the visualization
- Allows for user to select the link with the file type then customize variables
- Visual narrative through data
- Creates recommendations for other analyses (e.g., related variables, how things might change) based on their background while they're on the site

Mockup idea

SanGIS/SANDAG GIS Data Warehouse

San Diego's Regional GIS Data So
Visit the SANDAG/SanGIS Region

GIS Data Categories

Click a category link to view the

Address	District
Agriculture	Ecology
Airport	Fire
Business	Geology
Census	Grid
Community	

Available Downloads

Use the browser back button to

Metadata PDF

- [Assessor_Book.pdf](#)
- [Landbase_Boundaries.pdf](#)
- [Lots.pdf](#)
- [Parcels.pdf](#)
- [Parcels_East.pdf](#)
- [Parcels_North.pdf](#)
- [Parcels_South.pdf](#)

✕ We see you've selected [Parcels_South.pdf]. This looks like it contains **home data**. Let's get started by customizing what you're looking for.

1. What are you hoping to get out of this data? ^

Condensed info **Clusters of info** Data patterns

Story of the data Similar trends Opposing trends

Simple chart Geometrical representation **Related data**

2. How much experience do you have with this data topic? v

3. What are your data plot variables? v

[Next step >](#)

- [PARCELS_EAST.zip](#)
- [Parcels_North.zip](#)
- [PARCELS_SOUTH.zip](#)



SanGIS/SANDAG GIS Data Warehouse

San Diego's Regional GIS Data So
Visit the SANDAG/SanGIS Region

GIS Data Categories

Click a category link to view the

- Address
- Agriculture
- Airport
- Business
- Census
- Community
- District
- Ecology
- Fire
- Geology
- Grid

Available Downloads

Use the browser back button to

Metadata PDF

- Assessor_Book.pdf
- Landbase_Boundaries.pdf
- Lots.pdf
- Parcels.pdf
- Parcels_East.pdf
- Parcels_North.pdf
- Parcels_South.pdf

✕ We unpacked some interesting home data for [Parcels_South.pdf]. Here is a data story and you can customize the visualizations

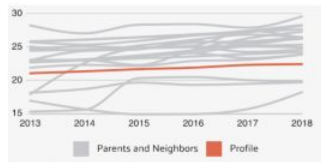
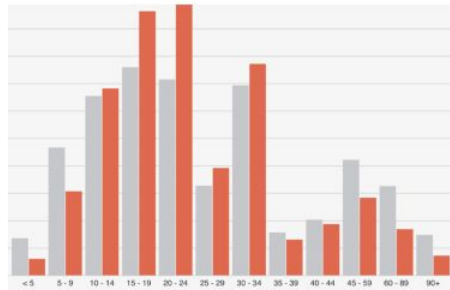
Age home owner

24 years old

Average age homeowner

Using averages, younger folks own homes (24 years old) than the normal US homeowner (32 years old). This potentially points to the average age person in the county (60 years old) is younger than the average in the US (72 years old).

The char (right bottom) shows the median homeowner age range in different years comparing to that of neighboring and parent geographies



Next >

PARCELS_SOUTH.zip



SanGIS/SANDAG GIS Data Warehouse

San Diego's Regional
Visit the SANDAG

- GIS Data C
- Click a category
- Address
- Agriculture
- Airport
- Business
- Census
- Community

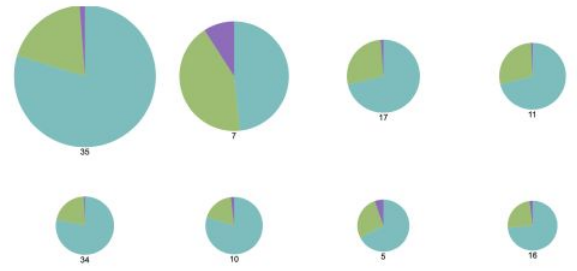
- Available D
- Use the browse
- Metadata PDF
- Assessor_Book
- Landbase_Book
- Lots.pdf
- Parcels.pdf
- Parcels_East.p
- Parcels_North.p
- Parcels_South.pdf

✕ We unpacked some interesting **home data** for [Parcels_South.pdf]. Here is a data story and you can customize the visualizations

Change your variables and labels

Double click to change label name

Site address (int) Tax status (str)
Assessed value (int) Property value (int)
Value increase (dbl) Street address (str)
Acreage (dbl) Area (int) Est (int)



Customize your graph

Color scale Ordinal (categories) ▼
Ordinal (categories)
Linear (numeric)

Sort arcs by size ▼
size
name

Rows 4 ▼

Width 800 ▼

Columns 4 ▼

Height 800 ▼

Show values

Fill chart

< Previous



PARCELS_SOUTH.zip

ideas that came from discussion:

- add a share button :O so you can share with friends this data story
-

User Experience: Input vs Output

INPUT

- Find out what users need from data
- Find out relevant background info of the user (e.g., expertise, comfort with data)

OUTPUT

- Have first inquiry into the data be tailored to their aims and background
- Show suggested analyses based on related variables or what other people with similar backgrounds have explored

Any questions?
What is your feedback?