

# Data Visualization

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2020-08-26

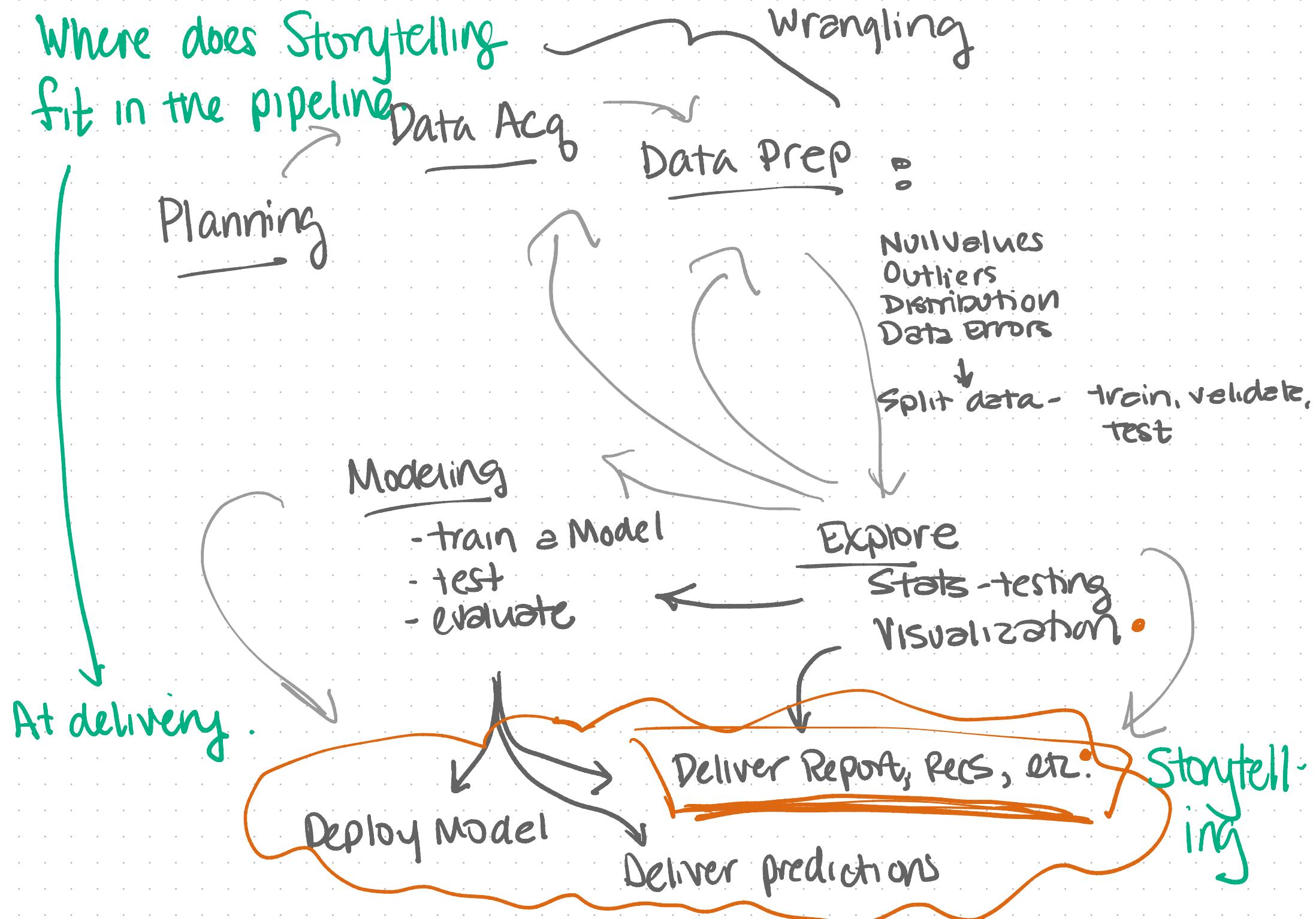
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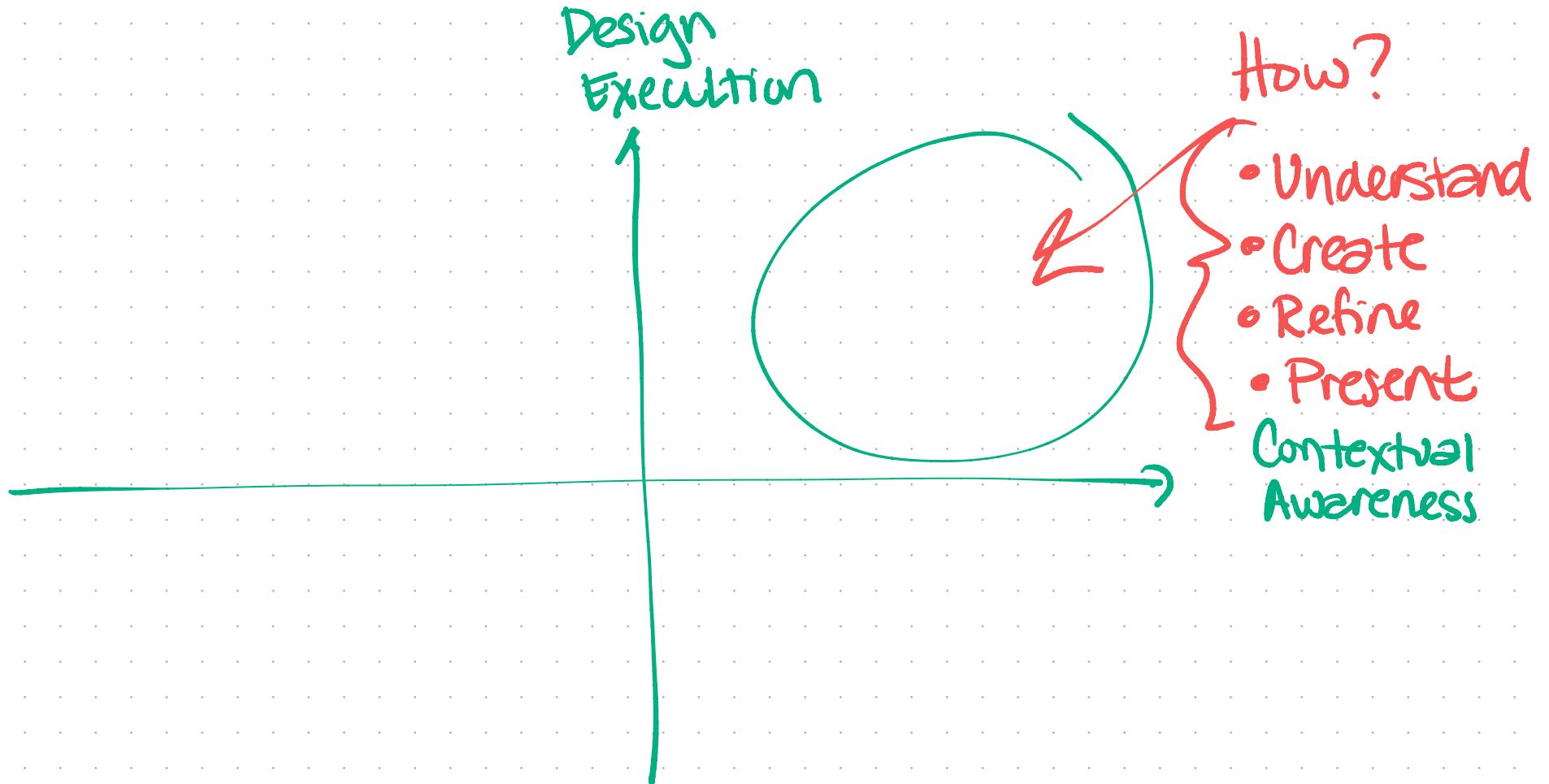
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Where does Storytelling fit in the pipeline



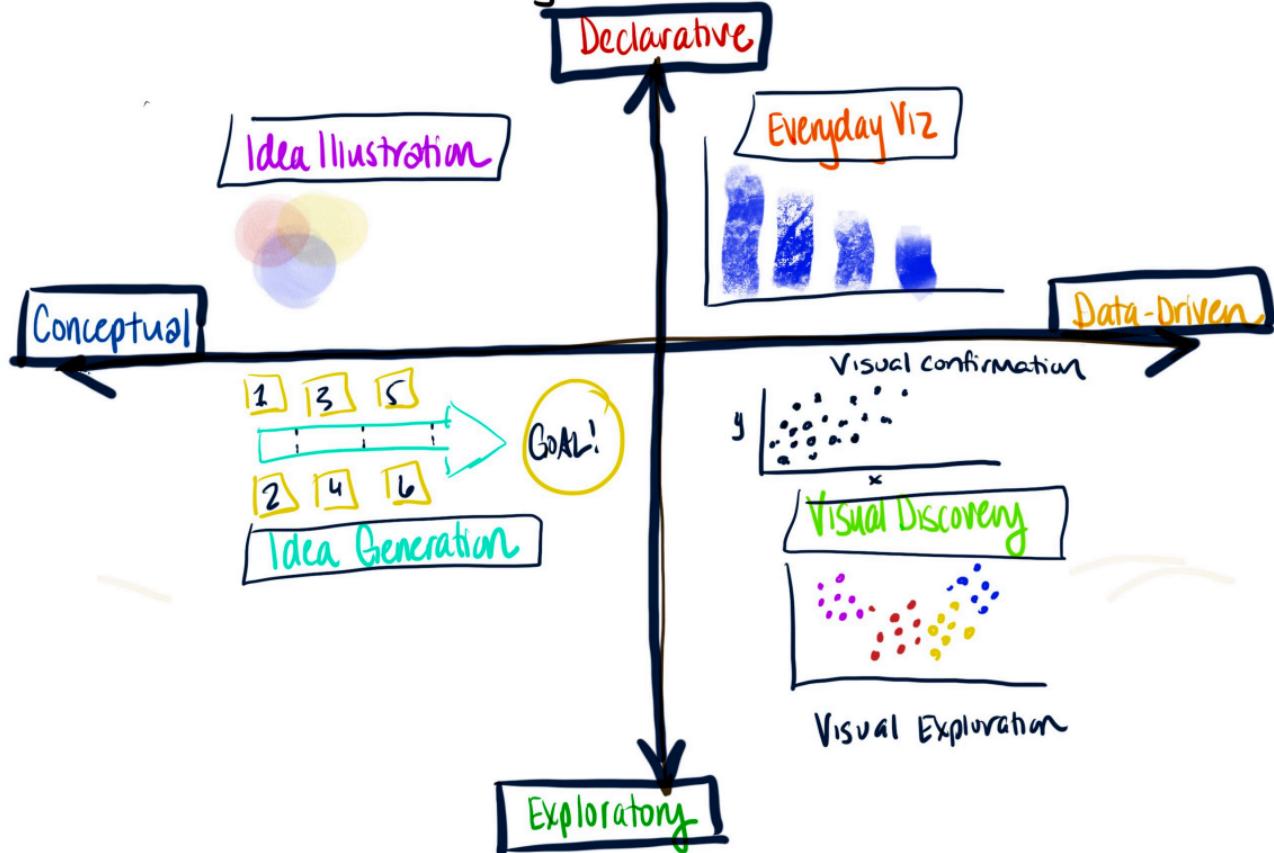


Good Charts - Scott Berinato | Data Story - Nancy Duarte

# STEPS TO A GOOD CHART

- Understand ----- {
  - ... what makes a chart 'good'
  - ... how to critique charts
  - ... how we process visually
- ↳ Create ----- [prepare to create → talk, listen →  
sketch → prototype]
- ↳ Refine ----- [
  - to impress
  - to empower
  - to persuade
  - to ensure truth/clarity
- ↳ Present ----- [
  - how will you grab the attn?
  - what is your big idea?
  - who, what, and how of your presentation?
  - Practice & Present

# Types of Visualization



# UNDERSTAND

Understand what it means to be a good chart

- effective
- helps people see the truth, doesn't deceive
- tells your story

understand a good chart by systematically critiquing it

Note: 1st few things you see      ] do these  
1st ideas that come to mind      ] Match → { the main idea?  
    the chart's apparent intent?

- Is anything misleading?
- Is something missing?
- Note likes, dislikes, wish-I-saws
- What are 3 things you would change? Why?
- Sketch / prototype your own version then critique it.

# UNDERSTAND

... how we process visually

## How we see

We don't go in order

We see first what stands out

We only see a few things at once.

We seek meaning and make connections

Our brains use experience and expectations to make cognitive shortcuts

We process pictures better than numbers.

## How to use that information

| don't organize right → left → top → bottom assuming that is how it will be consumed.

| Make what you want the audience to see first stand out.

| Reduce the # of things on a chart

| Gray out context that needs to remain but not seen as same importance as key idea.

| Reduce the number of colors

| If meaning is not clearly understood, we will make our own, so ensure meaning is not misrepresented

| use conventions & metaphors

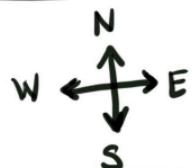
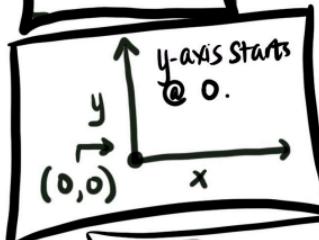
| limit numbers, limit precision

# UNDERSTAND

~~Positive Neg~~ Contentions and Metaphors



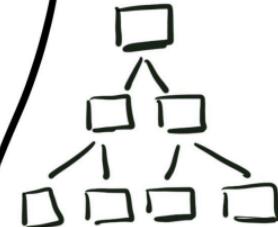
Hot Cold



distinct colors = distinct categories

Student Nurse  
Teacher Doctor

hierarchies



emptier ← fuller  
Lower ← higher

Arranged from highest to lowest

desserts - like colors → like items

Vanilla ice cream  
Chocolate ice cream

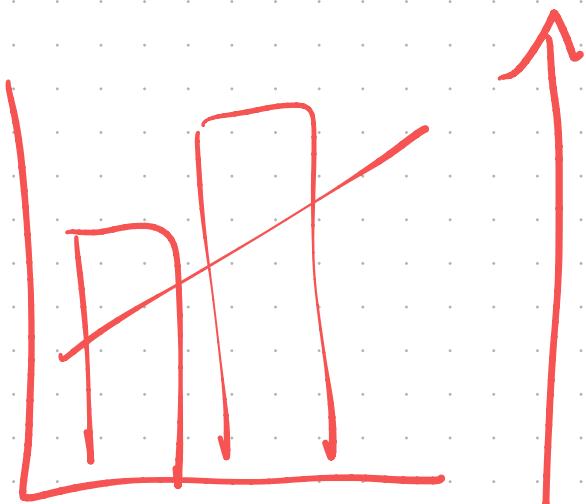
Key lime pie  
Pumpkin pie

Angel food cake  
Carrot cake

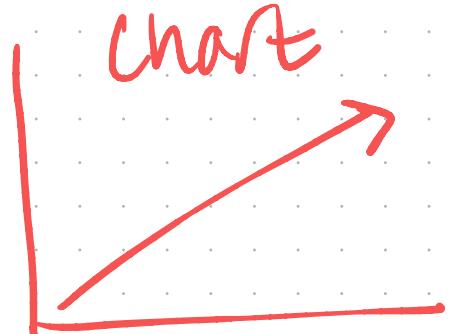
Connected data points → relationship from 1 value to the next, like time, but NOT categories.

color gradient/saturation

higher → lower values



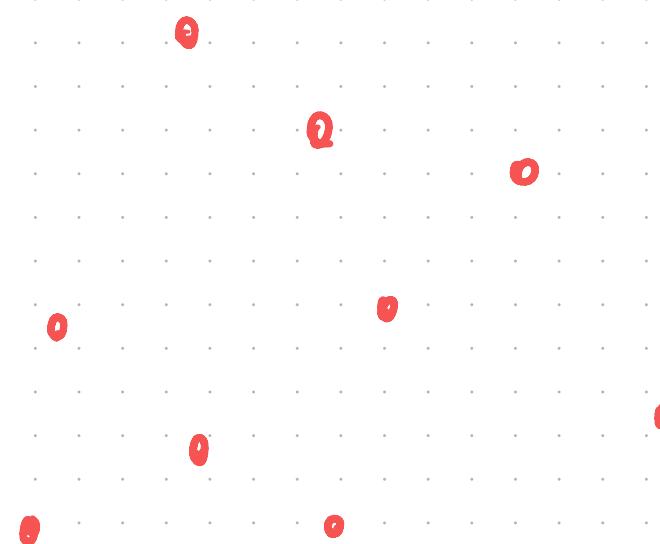
Chart



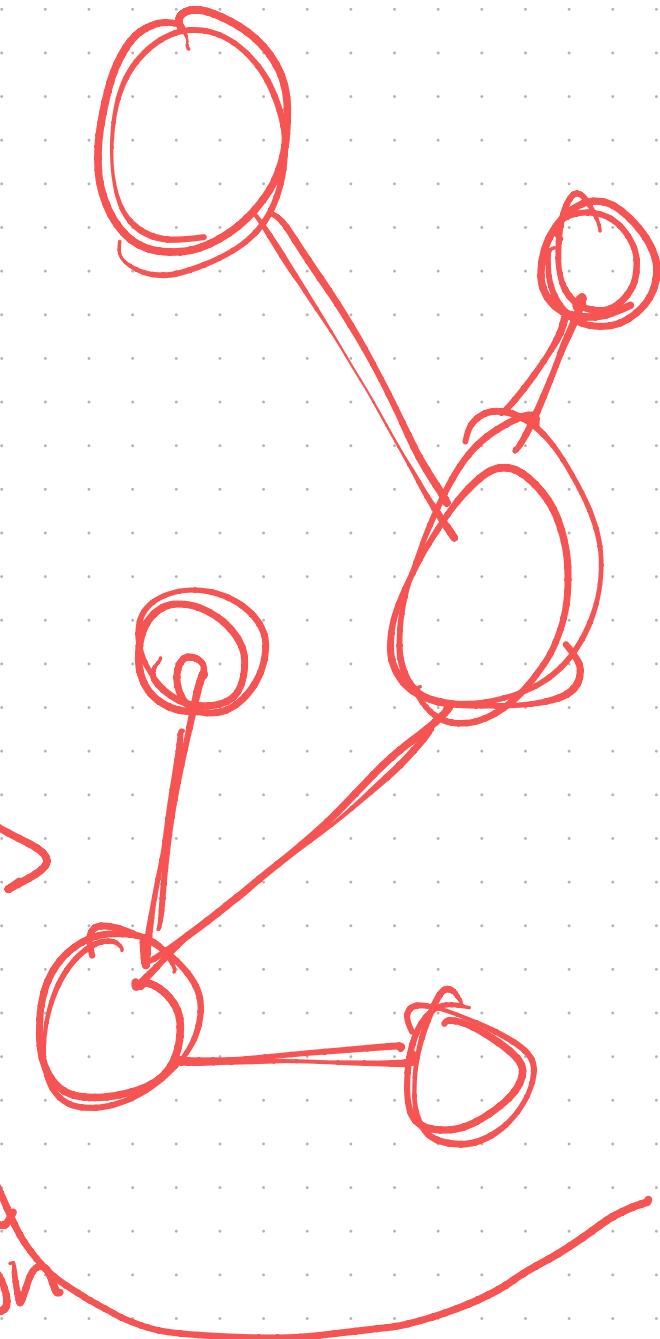
Chart

graph · linear  
regression

plot



Network  
graph



# CREATE

## Prepare to Create

- 5 minutes
- USE NO data
- leave with a sketch

1. ID the Story framework
2. ID your audience
3. Know your setting
4. Brainstorm ideas
5. ID type(s) of Viz

## Talk & Listen

- 15 minutes
- explain basic info., organize thoughts.
- provide context.
- Listen for key words, gaps, questions, take notes

### Questions to Answer:

- What am I working on?
- What am I trying to say?
- Show, prove or learn?
- Why? (5 times!)
- What keywords did you hear?
- What questions did your partner have?

## Sketch

- 20 min.
- Keywords → approaches
- Sketch → Quick, messy, no details, not to scale
- Why type of info. are you communicating?

## Prototype

- 20 min.
- Add in data - just enough needed to prototype
- Create non-digital prototype -

Understand → **Create** → Refine → Present

**↓**  
Prepare to create

→ talk & Listen → Sketch → Prototype

## Story Framework

- A: define the issue
- demonstrate the issue
- show what happens after implementing a change
- make recommendations

- B. Plot
- Rising Action
- Climax
- Falling action
- Ending

## Brainstorm

Braindump of ideas →

Refine ideas, group like ideas, discard those that won't work →

generate a visual, non-digital outline of content.

## Audience

Who is your audience?  
Have they ever seen this kind of chart before?  
What do they already know?  
Who else might see it & how?

## Setting

What setting will it be used in?  
How much time do I have?  
How will it be displayed?  
How big is the room?

## **Types of Viz**

Concentric

Idea  
Illustration

Exploratory

Declarative

Everyday Viz

Data

Driven

Idea Generation

Visual Discovery

Exploratory

# Prepare to Create

## 1 1D. Story framework →

Define the issue -

Demonstrate - "

Show what happens after △

Make recommendations -

①

Issue: there are so many tools, things to learn, different recs. for peo. moving into data science, that its impossible to learn it all. The most imp. is a programming tool. Soooo, should they learn Python or R? Python.

②

Demonstrate the issue: what type of viz would demonstrate the issue - The larger issue of so many tools - Big Data landscape comparison - comparison; I want to demonstrate that job reqs for DS. show "either Python or R" OR "Python" only, rarely "R" only.

If you know Python only, how many will you meet "on paper" if " " " R only" " " " " " "

OR - If you know Python, how many will you meet vs NOT  
? If you know R, " " " " " "

③

Show what happens after a change, → after you take

the rec. of learning Python?

④

Rec. = Select Python. All other things being equal.

⑤ goal: leave no doubt in the aspiring ds. mind that learning Python is a good idea & no need to learn R right now.

b) What do I want them to do about it?

feel conf. & diff. in to learning Python w/o spreading oneself, too thin across mult. platforms, tools to where its hard to learn anything.

⑦ Type of Viz:  
Comparisons, simple.  
bar chart, line chart.

## 2. Audience

Who? Aspiring D.S. - publish in a blog post -  
size = my small / avg. network  
final doc.

Background / exp. w/ Data, this type of chart? Prior exp.  
tech. acumen: ↑, above avg.

What do they already know? - What Python & R are,  
how do they respond to info? prob. in learning  
mode, likely receptive.

Who else might see it & how?

- hiring managers
- recruiters
- D.S. looking for more team members.
- an existing D.S. knowing R is not python
- career counselors / guidance counselors
- educators / curriculum devs.

Attention to detail? - I am NOT going to have full attn.!

better than the avg. observer!

Our data source - LinkedIn -  
what it is, etc.

- they might already have preconceived ideas of what is most important
- google "learn ds." to see what maybe peo. are being recommended.

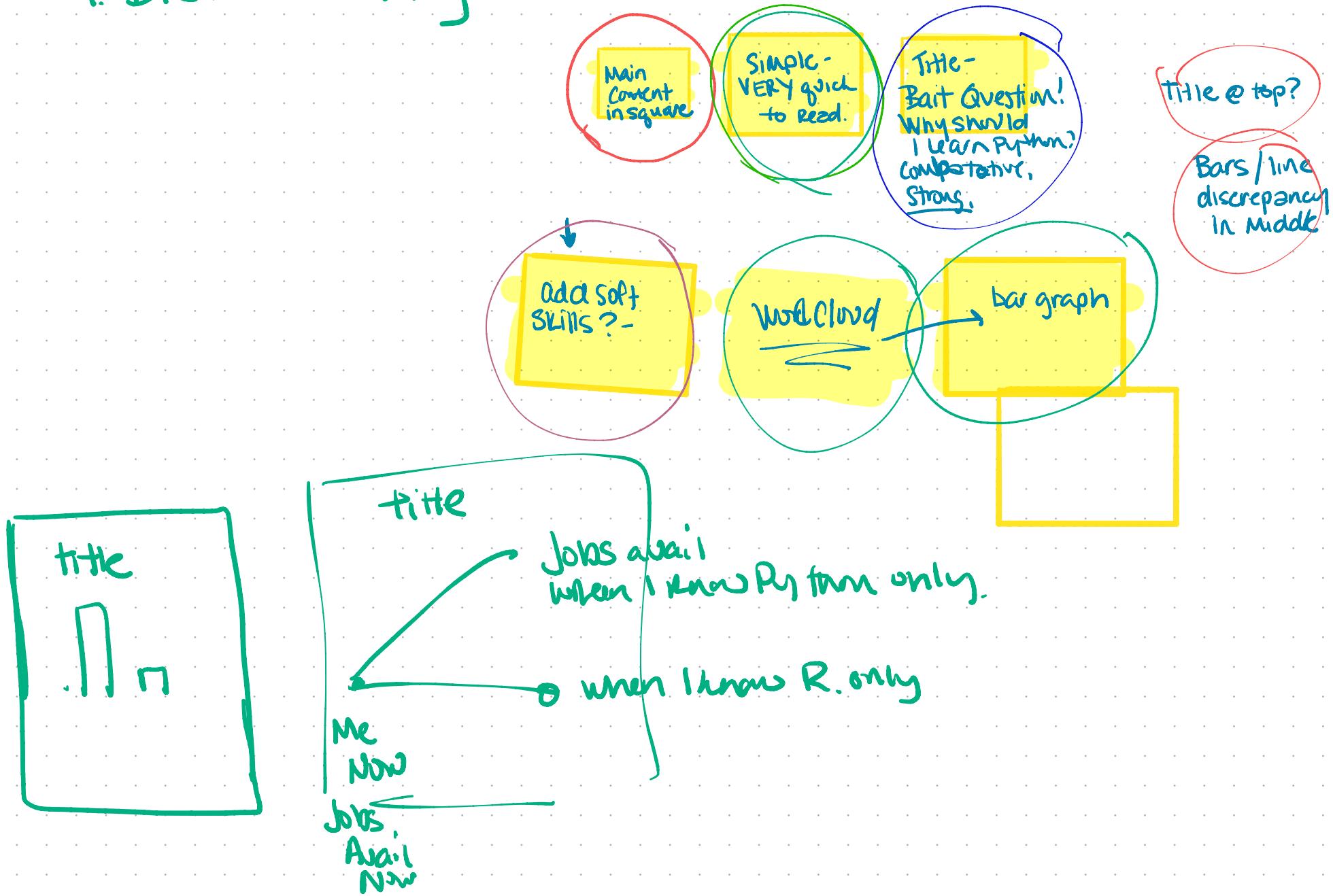
Connected to audience?

- Yes - directly -
- indirect possibly.
- do I have an existing brand/rep?

### 3. Setting

- ① setting - audience own environment, likely on mobile device
- ② time? limited - as much time before the next thing  
grabs their attn.
- ③ prob. on mobile device, might be only in small  
preview box on sm. feed. - e.g. twitter feed size is  
~~square~~ square - if never click on image.
- ④ Room? - NA - NO ROOM

## 4. Brainstorming



## 5. Types of Vizs .

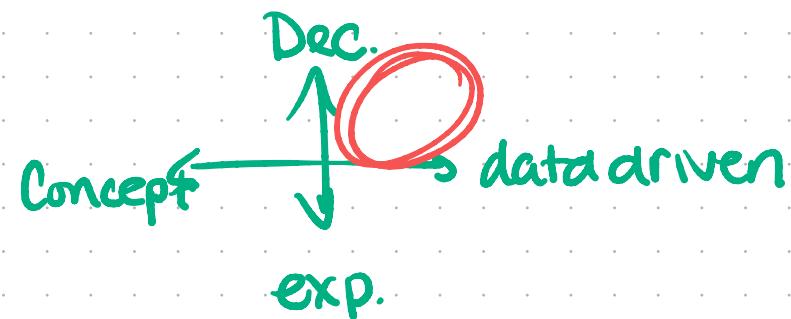
Data: Simple, low volume

Viz type: conventional / static

Viz features: clear point simple narrative

Biz Talent: Design / Storytelling

Goals: Affirm, recommend; set context



## B. TALK and LISTEN -

I talk. partner listens & takes notes. asks questions, why... .

- keywords. "difference", "compare", ...

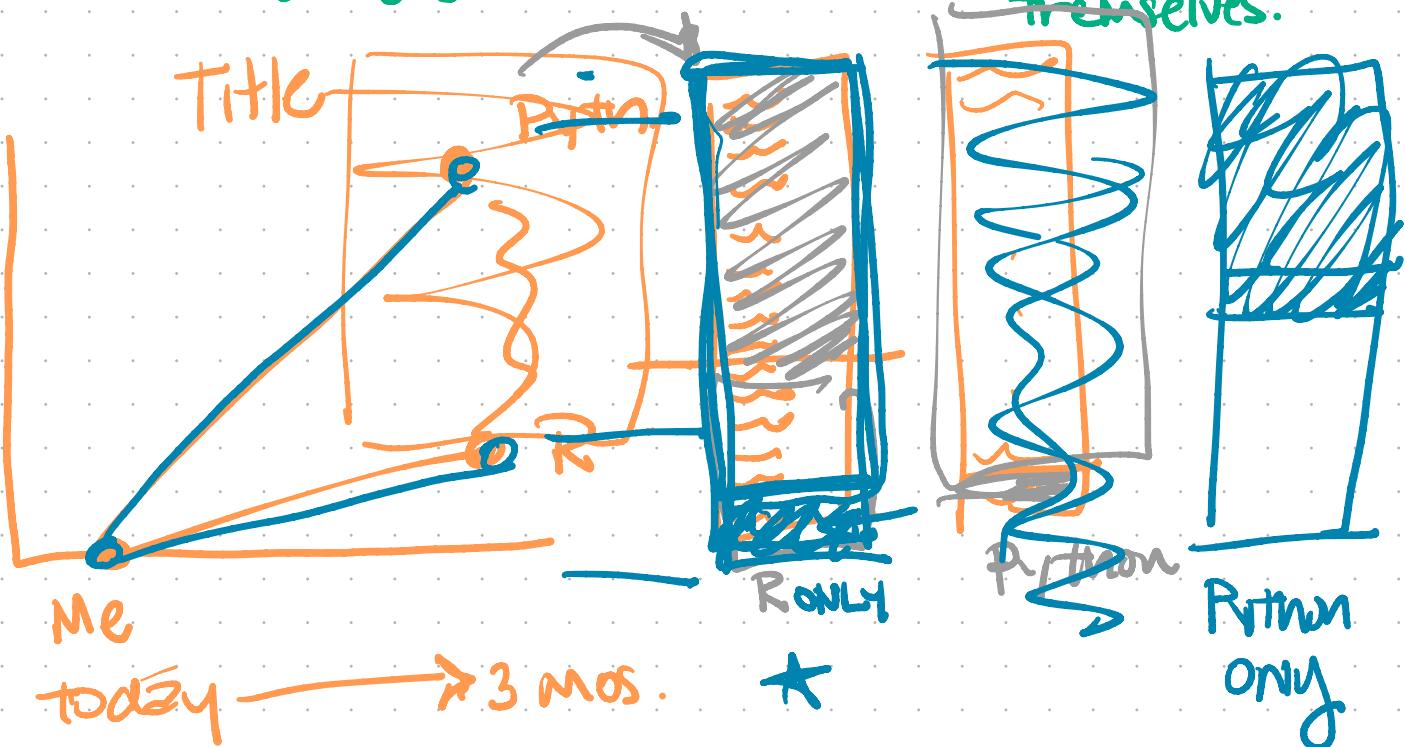
## C. SKETCH

- what type of info?
- Map keywords to approaches
- sketch quickly - w/o calc, w/o details.

Quant →  
• numerical (frequency) → counted / ordered → viz stats,  
• categorical (language)

not the obs.  
themselves.

Comparison:



## D. Prototype

Are you ready to begin?

do sketches match?

Am I refining one idea?

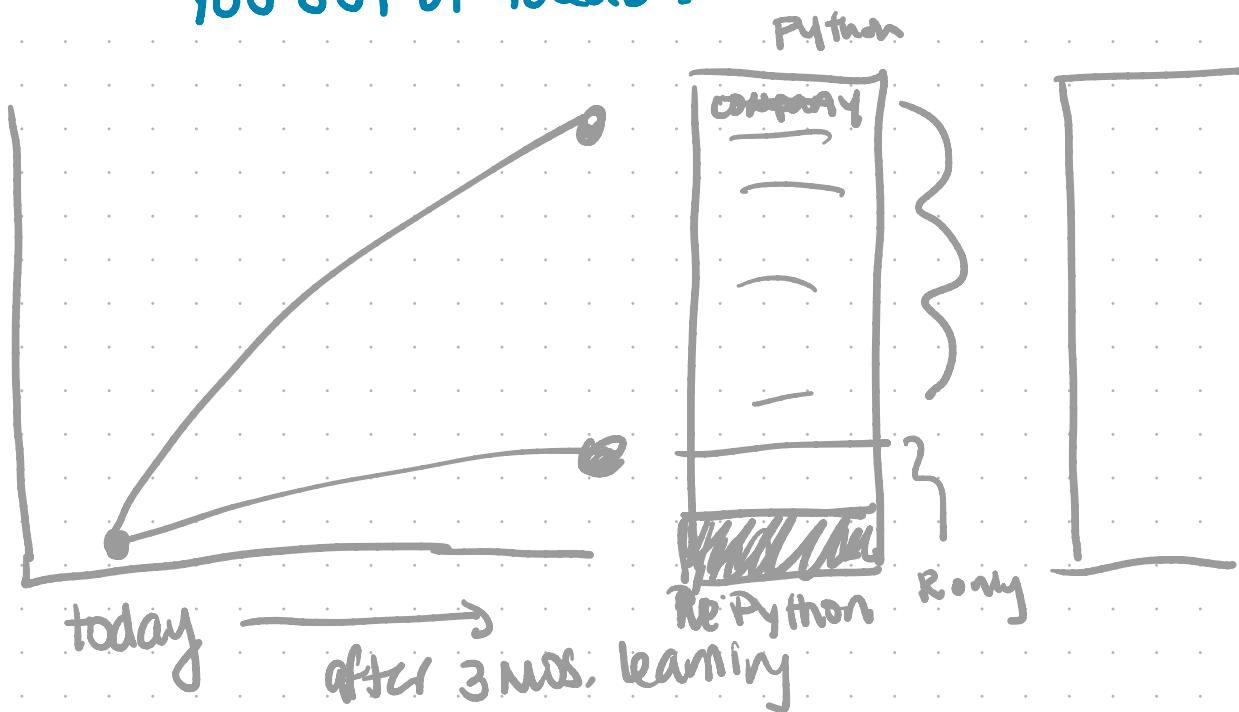
Adding more details?

Designing?

You out of ideas?

Move to  
Prototype

jobs I qual.  
for &  
\*purely  
limited to  
Python / R



Data - Telco Churn Data - via zoom.

Audience - VP Ops, Sales VP will prob. receive it second hand.

Goal - We need to reduce Churn! (VP Ops)

Sales VP told me - NO changes to contracts.  
keeping M2M. One Yr. 2yr.

Your goal - come up w/ 1 recommendation of a change  
we can make that will lead to reduction in churn.

How?

Select 1 contract type - analyze only those cust. w/ that  
contract type.

Some ideas → • does support services keep customers?  
• does package of prod./services affect retention?  
• Stop inc. prices as customer stays -

Presentation; not a single viz..-

- 1 making your point
- expect changes if rec. is implemented.