

Sponsor: University of Utah Primary Children's Hospital

CHILDREN'S PERSONAL HEALTH DASHBOARD

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WHY HEALTH DASHBOARD?

- Lack of engaging patient communication
 - ↓ motivation and involvement in health progress
- Parental engagement and comprehension
- Dr. Ware's Vision
 - Data accessibility
 - Data visualisation
 - Empowering young patients and family



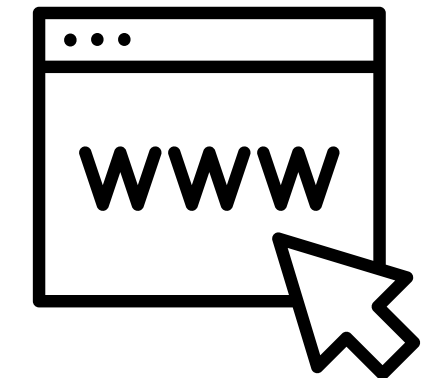
INITIAL RESEARCH

SCORING SYSTEM



SOFTWARE TOOLS

 **REDCap**

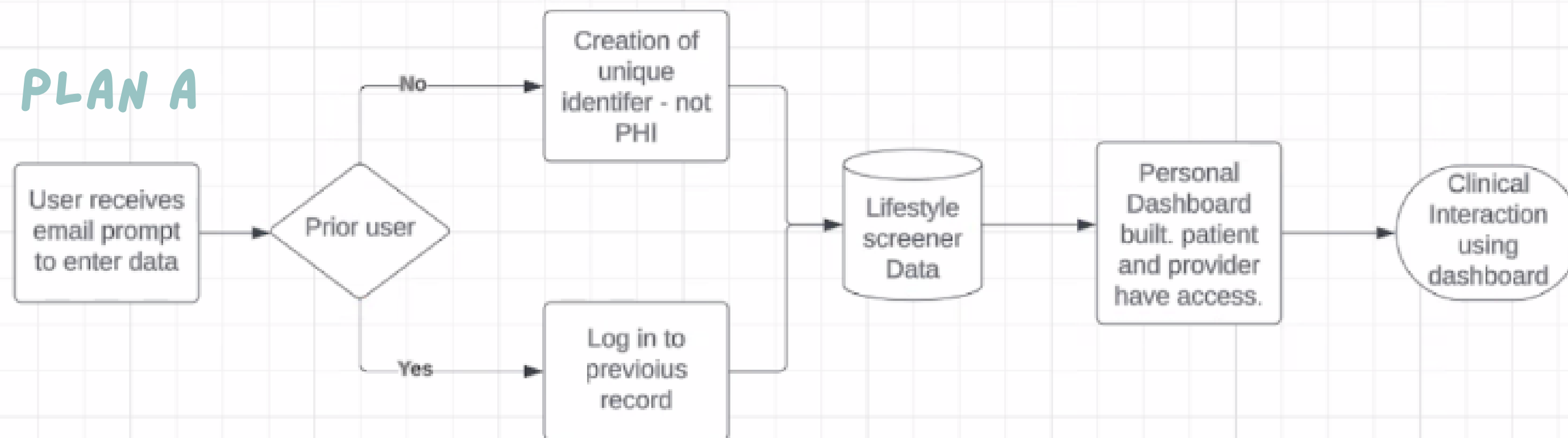


 **+ a b l e a u**

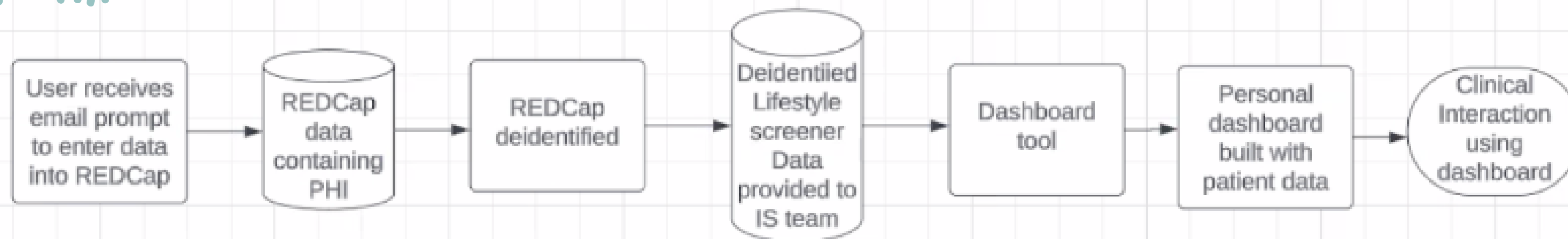


INITIAL RESEARCH

PLAN A



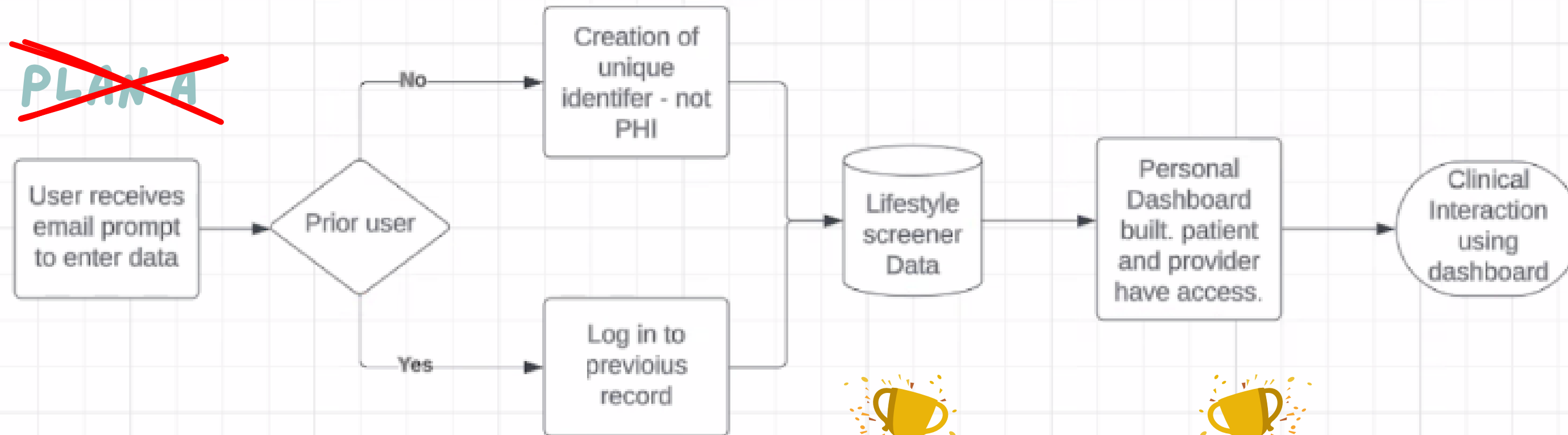
PLAN B



INITIAL RESEARCH



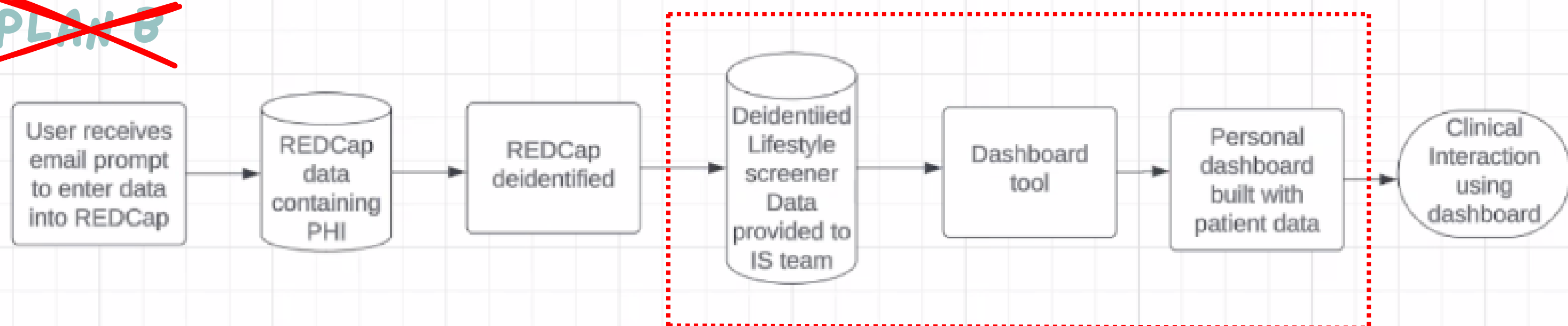
~~PLAN A~~



PLAN C



~~PLAN B~~





PROJECT OVERVIEW



1

DATA CLEANING

2

HEALTH DATA
SCORING SYSTEM

3

HEALTH DASHBOARD

4



SYSTEM
ADMINISTRATION +
ACCESS CONTROL

5

SECURITY AWARENESS
TRAINING

6

INCIDENT
RESPONSE



DATA WORKFLOW





PHYSICAL SURVEY

Preventive Cardiology Lifestyle Screener (Age 10+ years)					
On average, over the past month how often did you eat or drink a serving of the following...	Rarely or never	1-2 times per WEEK	3-4 times per WEEK	5-7 times per WEEK	≥2 times per DAY
1. Vegetables (not including potatoes, peas, corn)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Fruit (not including juice)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Beans and legumes (chickpeas, lentils)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Nuts and seeds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Cold water fish (salmon, tuna, halibut)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. All other fish (including shellfish, shrimp, squid)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Chicken or turkey <i>with</i> skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Chicken or turkey <i>without</i> skin, eggs, tofu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Fresh red meats including beef, lamb, pork	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Processed meats (deli meats, bacon, salami)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Brown rice, whole grain bread, oatmeal, other grains, high fiber cereal, high fiber crackers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. White bread, white rice, crackers, grits, regular cereal, pasta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Potatoes (baked, mashed, fried, chips)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Candy, baked sweets (pastries, cakes, cookies, donuts, pie)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

> 50 columns!



DATA CLEAN UP

42. Over the past mo	43. Do you keep elec
8-Jul	Always
>=9	Sometimes
>=9	Never
>=9	Sometimes
8-Jul	
8-Jul	Often
8-Jul	Often
8-Jul	Always
>=9	Never
8-Jul	Never
8-Jul	Often

main Children-Hospital-Dashboard / Pediatric - Data pipeline - Cleaning_indexes.ipynb

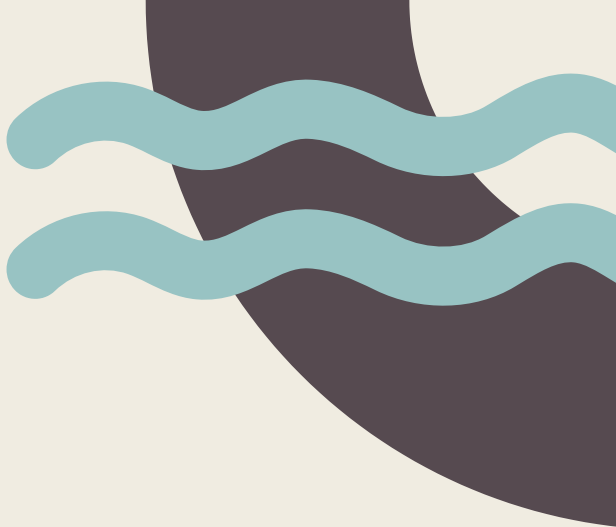
Code Blame 2574 lines (2574 loc) · 115 KB

Correct Values

[37]: healthDF.loc[healthDF['42_Sleep_per_day'] == '8-Jul', '42_Sleep_per_day'] = '7-8'
healthDF.loc[healthDF['46_Smoker'] == 'I\ve never smoked', '46_Smoker'] = 'Never smoked'
healthDF.head(10)



SCORING SYSTEM



Behaviors	Descriptors	Item Score		Transit	Weight% in Behaviors	Weight% in Behaviors (Total)
Diet - Healthy Food	1. Vegetables (not including potatoes, peas, corn)	2.00	4.5	more important	15.00%	100.00%
Diet - Healthy Food	2. Fruit (not including juice)	1.00	2.25	more important	15.00%	45.00%
Diet - Healthy Food	3. Beans and legumes (chickpeas, lentils)	1.00	1.178571429		7.86%	55.00%
Diet - Healthy Food	4. Nuts and seeds	1.00	1.178571429		7.86%	
Diet - Healthy Food	5. Cold water fish (salmon, tuna, halibut)	1.00	2.25	more important	15.00%	
Diet - Unhealthy Food	6. All other fish (including shellfish, shrimp, squid)	1.00	1.178571429		7.86%	
	7. Chicken or turkey with skin	2.00	2.357142857		7.86%	

Builtup Calculator





SCORING SYSTEM

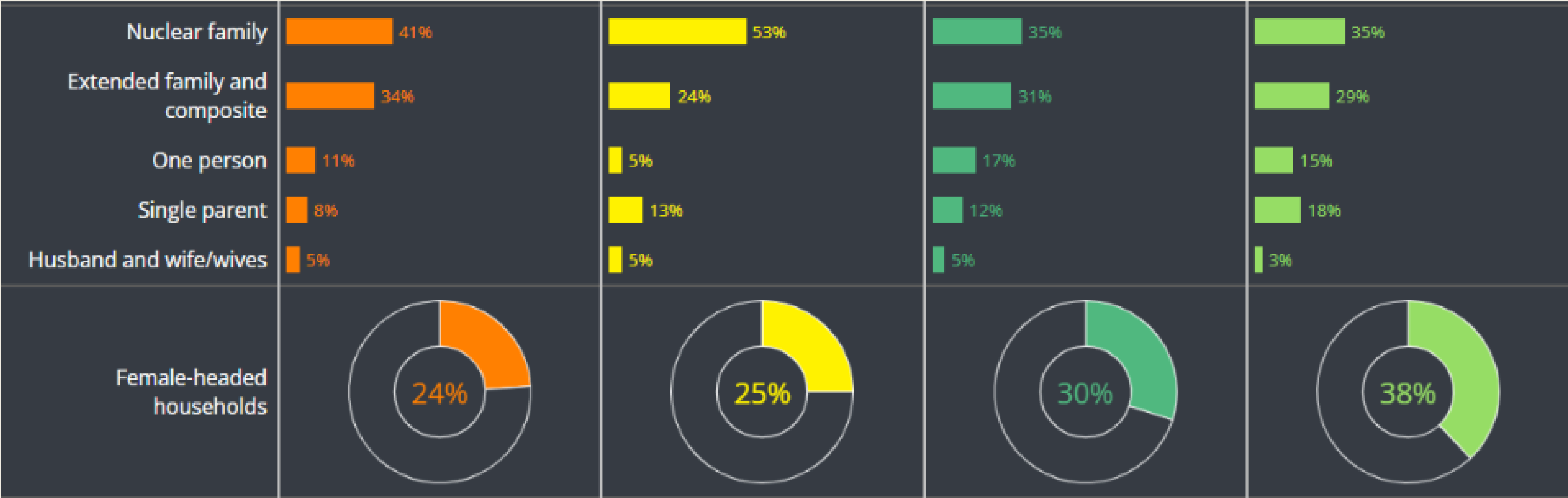
```
def update_smoking_score(row):  
    if row['46_Smoker_never smoked'] == 1 or '45_Smoking_home_no' == 1:  
        return row['smoking_score'] + 100  
    else:  
        return row['smoking_score']  
    return row['smoking_score']  
  
# Apply the function to the DataFrame  
healthDF['smoking_score'] = healthDF.apply(update_smoking_score, axis=1)
```

Example Code

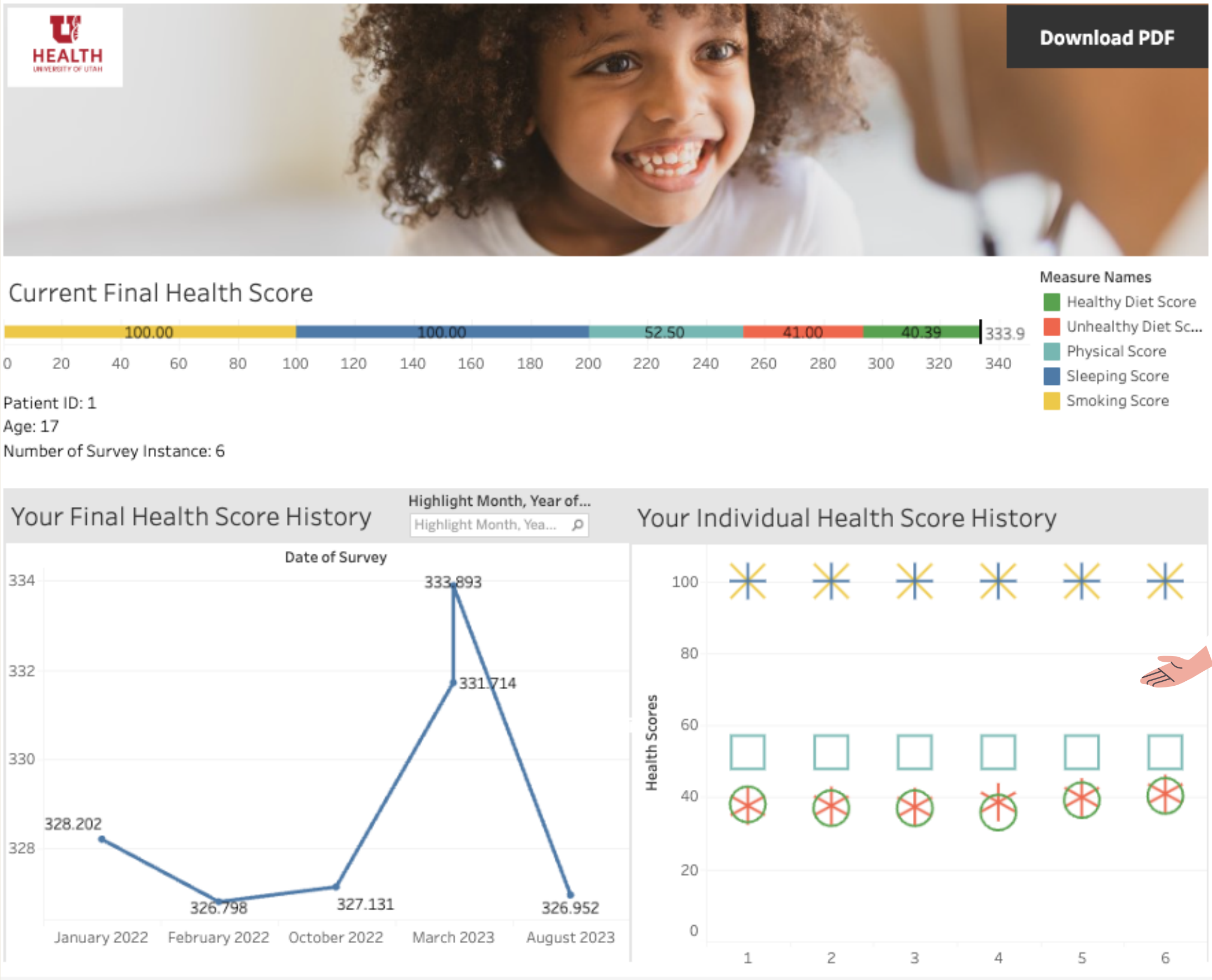


VISION FOR THE DASHBOARD

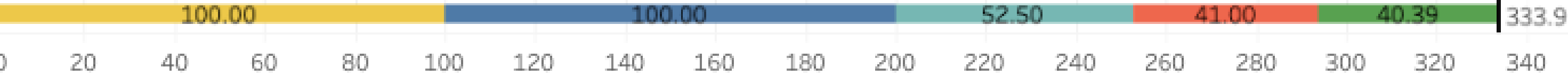
What is our initial vision?



THE DASHBOARD



Current Final Health Score

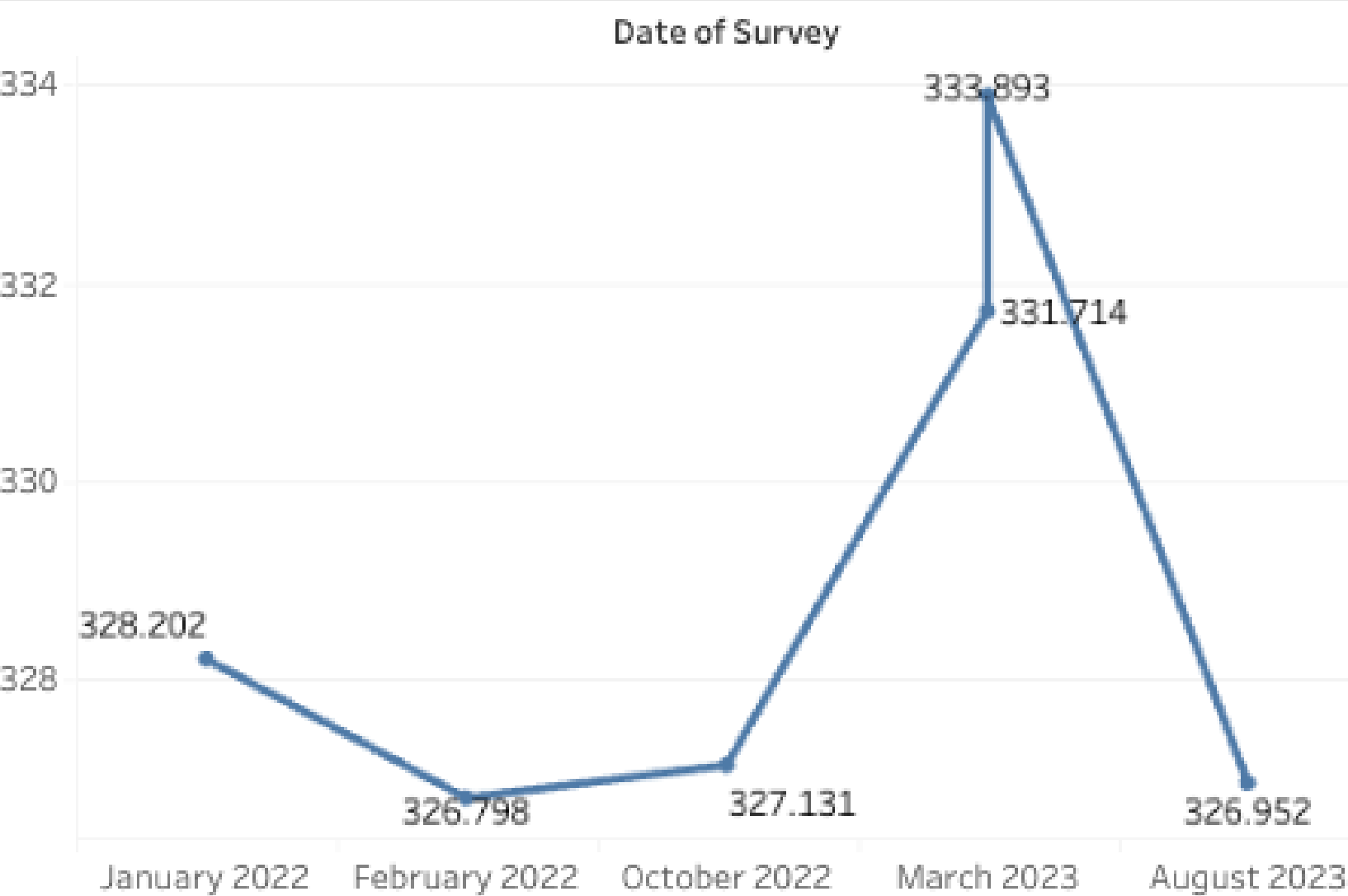


- Measure Names
- Healthy Diet Score
 - Unhealthy Diet Sc...
 - Physical Score
 - Sleeping Score
 - Smoking Score

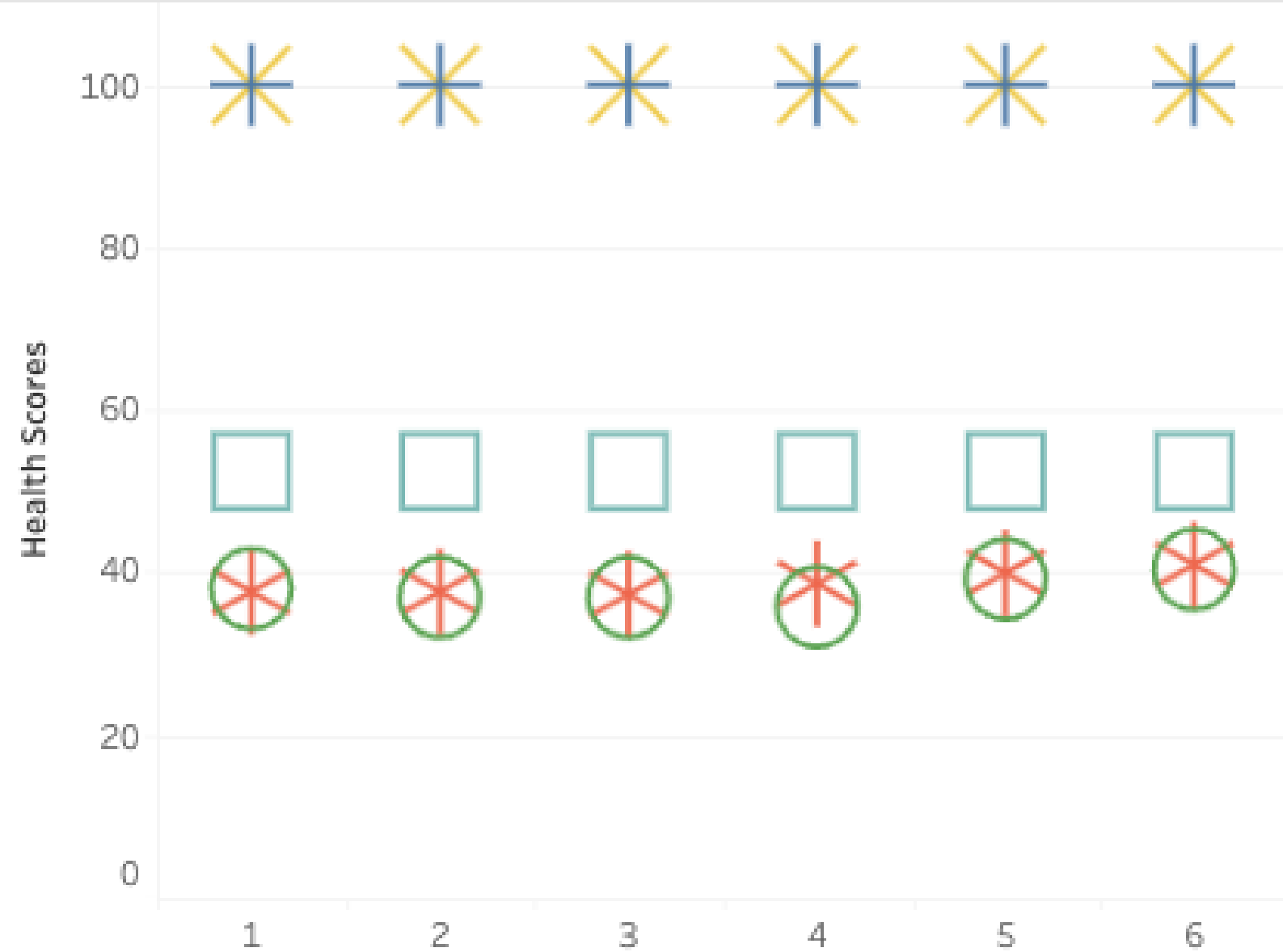
Patient ID: 1
Age: 17
Number of Survey Instance: 6

Your Final Health Score History

Highlight Month, Year of...
Highlight Month, Yea...



Your Individual Health Score History



SITE ADMINISTRATION AND BUILDING TRUST

- Integrated Health Dashboard with Tailored Access for



x 3

Practitioner



x 1

Administrator



x 2

Data Analyst



x 10

Patient

- Patient confidentiality is paramount.
- Preventing unauthorized access, prompt accessibility and unambiguous discourse.



WHY TABLEAU CLOUD?

- Built-in access controls, row-level security functionality, and secure server setups.
- Tableau Cloud offers High scalability.
- User-friendly interface for dashboard design that can be accessed via Tableau Mobile app.
- Robust encryption for data at rest and in transit.
- Reduced infrastructure costs.
- HIPPA compliant and SOC 2 Type II certified.



Admin Templates | Login Activity

Select Events or Distinct Actors

Number of events

Select User (Use with Number of Events)

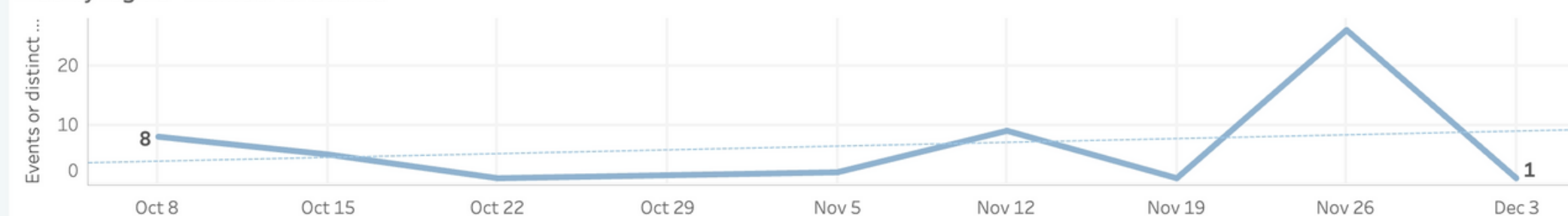
(All)

Select Timezone


Pacific Standard Time

Select Event Date


Last 90 days



Select number of days
since last login

0  1,000

Select User

(All) 

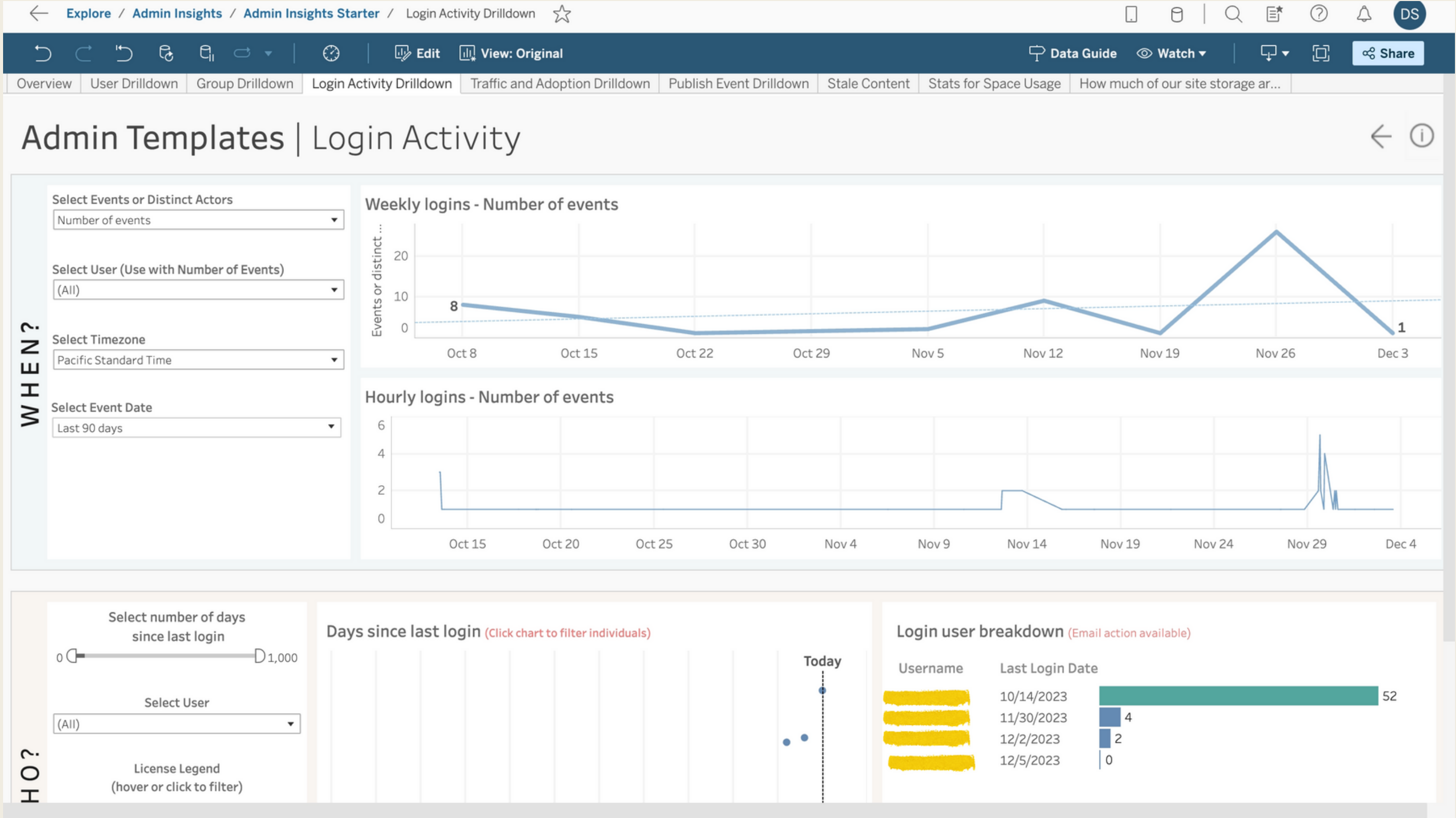
License Legend
(hover or click to filter)

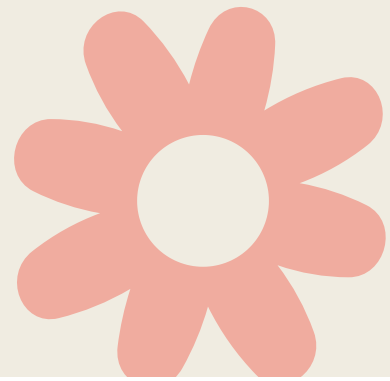


Username	Last Login Date	
[REDACTED]	10/14/2023	52
[REDACTED]	11/30/2023	4
[REDACTED]	12/2/2023	2
[REDACTED]	12/5/2023	0

[REDACTED]			✓	✗	✗
[REDACTED]@gmail.com	Unlicensed	✗	✗	✗	✗
[REDACTED]	Creator	✓	✓	✓	✓

SITE STATUS AND ADMIN INSIGHTS





MFA AND MOBILE APP SECURITY

General

Authentication

Bridge

Extensions

Integrations

Connected Apps

Mobile

Authentication types

Set sign-in options for users accessing Tableau Cloud. [Learn more](#)

☒ Tableau with MFA

☒ Enable an additional authentication method

☒ Google

Lets you set OpenID as your users' authentication method.

☐ Salesforce

Redirects users to login.salesforce.com for authentication.

[Edit My Domain...](#)

☐ SAML

Lets you set up an identity provider such as Okta or OneLogin with Tableau Cloud.

>

Edit Connection...

Default Authentication Type for Embedded Views

☒ Let users choose their authentication type

☐ Tableau with MFA

☐ Google

Control User Access in Authentication Workflows

Control user access to data through capturing user attributes during authentication workflows.[Learn more](#)

☒ Enable capture of user attributes in authentication workflows

General

Authentication

Bridge

Extensions

Integrations

Connected Apps

Mobile

Revert

Save

Tableau Mobile

Configure settings for Tableau Mobile.

App Lock

App lock requires users to open the app with a biometric method or device passcode. App lock is recommended only if the Connected Clients setting is enabled.

☒ Enable app lock

Offline Previews

Offline previews let users see their start pages and favorite workbooks and views when they're not connected to the server.

☒ Enable offline previews

Mobile Security Policies

Configure mobile security policies for iOS and Android. Certain security policies are automatically enabled and cannot be disabled. Mobile security policies are not available for MAM versions of Tableau Mobile. [Learn more](#)

Jailbreak Detection

A jailbroken or rooted device can access content on Tableau, install apps or modify settings that are not approved.

☒ Enable jailbreak detection

Level

Critical

Malware Detection (Android only)

INCIDENT RESPONSE & SECURITY TRAINING IN HEALTHCARE DATA MANAGEMENT.



- Clearly outlined procedures for handling security incidents.
- Designated roles and responsibilities during incident detection, reaction, containment, and recovery.
- Ensuring all users understand security best practices.
- Tailored training for each user role based on their responsibilities.





CHALLENGES & LEARNINGS


Initial scopes of the project was HUGE!

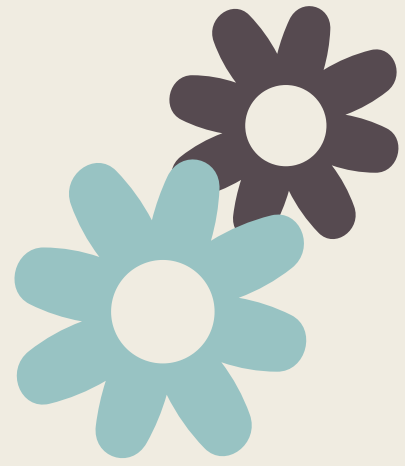
- Common misconception about the scope of the project. Align EXPECTATION!
 - Little experience in communicating technical context to non-technical audiences
 - Data availability - requires manual data entry
 - Always have a backup plan!
- 
- 



FUTURE IMPLEMENTATION



1. Simplify survey questions for better measurement
 2. Digitalize survey @ REDcap
 3. Develop a comprehensive data storage for survey data
 4. Cooperate with lab result on the dashboard
 5. Implement the dashboard for multiple clinics
- 

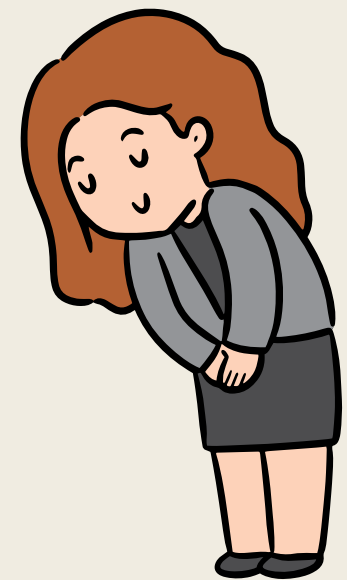


THANK YOU TO

DR. ADAM WARE,

PROF. VANDANA RAMACHANDRAN &

PROF. DAVE NORWOOD!



QUESTION TIME!