Design Thinking for BI

Team Members and Roles

Zehra Ahmed	Farah Inayat
Kisa Fatima	Zuha Aqib

YOUR BI TEAM

Create a doodle of your team - be creative!

Potential Facts

ARR_DELAY – Arrival delay in minutes

DEP_DELAY – Departure delay in minutes

CANCELLED – 1 if flight was cancelled, 0 if not

DIVERTED – 1 if flight was diverted, 0 if not

DISTANCE – Distance of the flight

AIR_TIME – Time spent flying

TAXI_IN, TAXI_OUT – Time on the ground after/before flying

CRS_DEP_TIME, CRS_ARR_TIME – Scheduled departure and arrival time

What's your dataset?

The dataset is about U.S. airline flights, including their delays, cancellations, and other flight details during the pandemic. It helps us understand flight performance and travel patterns.

Potential Dimensions

OP_UNIQUE_CARRIER – Airline name

ORIGIN, DEST – Airport codes for departure and arrival

FL_DATE – Flight date

DAY_OF_WEEK – Day of the week (1=Monday, 7=Sunday)

FL_NUM – Flight number

TAIL_NUM – Plane number

CANCELLATION_CODE – Reason if the flight was cancelled

BI DESIGN SPRINT - EMPATHIZE

For this design sprint, AI will act as your domain expert.

<u>AI Prompt example:</u>
Act as a [job role] working in [industry or domain]. I'm a student working on a Business Intelligence project, and I want to understand your needs. Can I ask you a few questions?

<u>Interview questions examples:</u>
- What does your everyday looks like?
- What decisions do you make regularly in your role?
- What information or data do you usually rely on?
- What challenges do you face when trying to make data-driven decisions?
- What kind of reports or dashboards are most helpful to you?
- What would make your job easier from a BI or analytics perspective?

Come up with more questions and jot them down. Make sure to keep the chat safe as you will be submitting it.

Act as a civil aviation manager at an international airport, managing flight delays & cancellations.
Some more Questions:
How do you monitor and manage flight delays and cancellations?
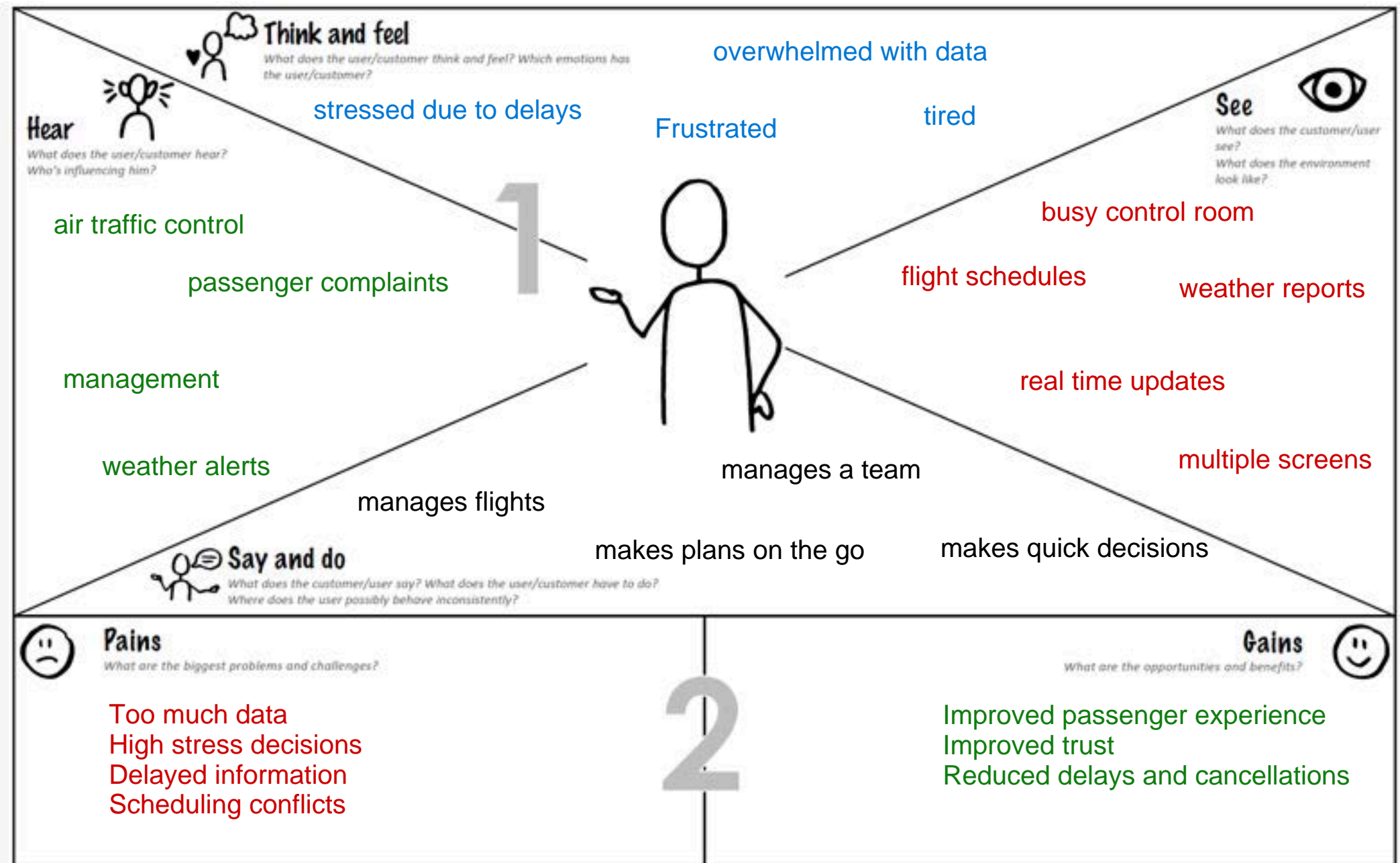Do you use historical data to predict future trends in air traffic or delays?
How important is real-time data for your daily operations?
Are there any decisions you wish could be automated with the help of BI tools?

https://chatgpt.com/share/683496cd-1b44-8002-9494-edf71a5cad25

Know Your Manager - Empathy Map

Think and feel
What does the user/customer think and feel? Which emotions has the user/customer?

overwhelmed with data

stressed due to delays

Frustrated

tired

Hear
What does the user/customer hear? Who's influencing him?

air traffic control

passenger complaints

management

weather alerts

See
What does the customer/user see? What does the environment look like?

busy control room

flight schedules

weather reports

real time updates

multiple screens

manages a team

manages flights

makes plans on the go

makes quick decisions

Say and do
What does the customer/user say? What does the user/customer have to do? Where does the user possibly behave inconsistently?

Pains
What are the biggest problems and challenges?

Too much data
High stress decisions
Delayed information
Scheduling conflicts

Gains
What are the opportunities and benefits?

Improved passenger experience
Improved trust
Reduced delays and cancellations

So what's the business problem?

"[Stakeholder], a [role] from [company], needs a way to [need] because [insight]. Fulfilling this need will help the organization [business impact]."

Fatima, a civil aviation officer from Jinnah International Airport, needs a way to manage excessive flight delays and cancellations due to recent political turmoil. Fulfilling this need will help the organization improve customer satisfaction and ensure smoother flight schedules.

How might we... (1 or 2 statements - Focus on a clear BI problem)

How might we provide Fatima with a real-time BI dashboard that integrates flight status, weather, and political event alerts to proactively manage delays and cancellations and use historical and live data to predict high-risk flights and automate decision-making for gate assignments and passenger communication, ensuring smoother operations.

BI DESIGN SPRINT - IDEATE

TEAM MEMBER 1 NAME | Kisa Fatima |

Come up with as many ideas. One idea per sticky note.

Unique carrier by Delay chart	Flight delay over time	Flight cancellation Score card (%)	Flight delay and countries.	Avg delay Scorecard.
Top 3 reasons for flight delays	Airport with most weather delay	Top 3 airport with most delay.	Distance by Delay.	Total Flights
Flight delay % scorecard	% On time Flights	Routes which have the most delay.	weather delay over time	Arrival time delay over routes.

No judgement - Go for volume - Be creative

BI DESIGN SPRINT - IDEATE

Design Thinking for BI

TEAM MEMBER 2 NAME Farah Inayat

Come up with as many ideas. One idea per sticky note.

City/Airport with most cancellation	City/Airport with most delays	Which delay type of delay is the highest	Highest Arr Delay	Airport with most weather delay
Reason for cancelation	Be Distance vs Airline	Unique carrier by delay chart	more issues in departure or arrival	Whi At what time are must flights delayed
Top Reasons for delays	% Delayed Flights	% Cancelled Flights	Dept delay Vs Arrival delay	Airline with most delays

No judgement - Go for volume - Be creative

(WE ____ ____ WE DONT JUDGE)

BI DESIGN SPRINT - IDEATE

TEAM MEMBER 3 NAME Zuha Aqib

Come up with as many ideas. One idea per sticky note.

lateness/ time of a taxi to get to aeroplane	top 3 reasons for flight delay	is weather delay more or carrier delay	new plane with most delay	top 3 country with delay
date with most delays	delay ratio with flight time	time of most delays	pilot with most delays	Airports with most delays (Top 3)
Highest Highest arrival delay	Top 3 reasons for flight cancellations	Carrier by Delay Chart .	Sankey Chart for route analysis	Yearly Delay Timeline -

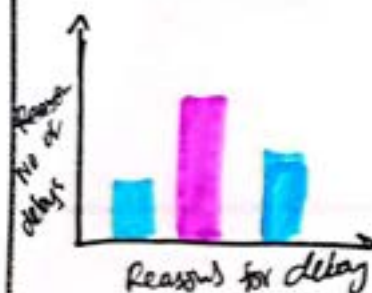**No judgement - Go for volume - Be creative**

BI DESIGN SPRINT _ IDEATE

TEAM MEMBER 4 NAME Zehra Ahmed.

Come up with as many ideas. One idea per sticky note.

- Top 3 airlines causing delay (Bar chart)
- Most imp cause of delay (Bar charts of Diff Delays)
- Highest Air Delay.
- Scatter plot of Yearly Trend & weather cause.
- Unique carrier by delay chart

- Sankey chart Dest & source countries
- Most popular Cancellation codes
- City with the most delays
- Most Tornado Dept of Arrival Dives.
- Total Flights

- Distance v/s Airline
- Yearly Delays Timeline.
- Avg delay scorecard. duration
- Avg Delay Scorecard count.
- On time Flights percentage

No Judgement - Go for volume - Be creative

BI DESIGN SPRINT - IDEATE

Crazy 4s - Sketch ideas that might be a BI solution
Each member will create this individually.

Avg Flight Delay

Flight cancellation %

Reasons for delay

Country 1 — Country 2

Top 3 Airlines with most delays (A1, A2, A3)

root Delays — A1, A2, A3 — Qtr 1, Qtr 2, Qtr 3

Delay vs Dist

Cancellation | Delays

Unique carriers & flights

1
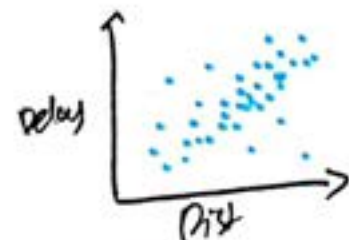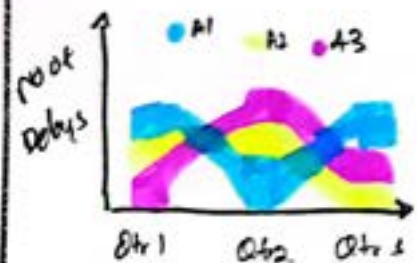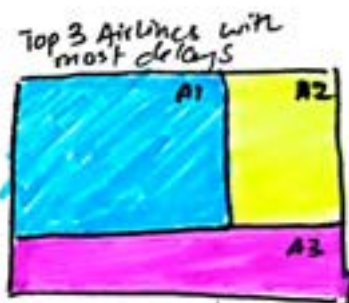
Team member Name

Kisa

Fatima

2

3

4

Crazy 4s - Sketch ideas that might be a BI solution
Each member will create this individually.

2

Airport with most delays	Airport with most concellations	Highest Arr Delay	Percentage of flights with Arr_Dells

Bar Chart for Delays
Bar for each type % delay

Fiechart Count of Delay vs Count of
Cancellation
Delay
Concellation

Arrival vs Departure legend. Airport

Line Chart concellation & Date
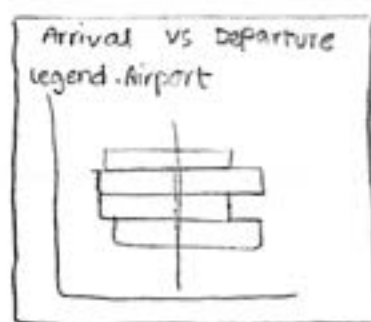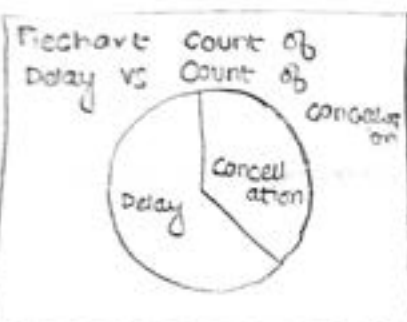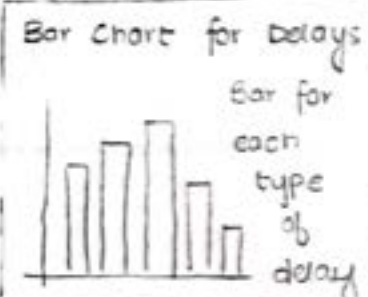
Team member
Name

Farah

Inayat

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BI DESIGN SPRINT - IDEATE

Crazy 4s - Sketch ideas that might be a BI solution
Each member will create this individually.

FLIGHT DELAYS AND CANCELLATIONS

3

| Flight no. with highest delay | dep. country with highest delays | dest. country with highest delays |

Time of Delay

Earlier flights and unique carriers

Top 5 reasons of delay
1 _____
2 _____
2 _____
3 _____
4 _____
5 _____

Security Delay in day-time range

Carrier Delay vs Weather Delay (Time)
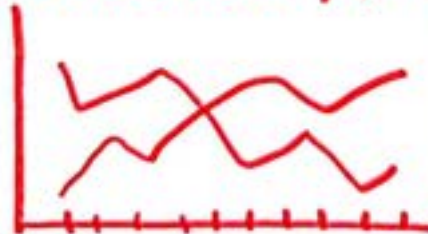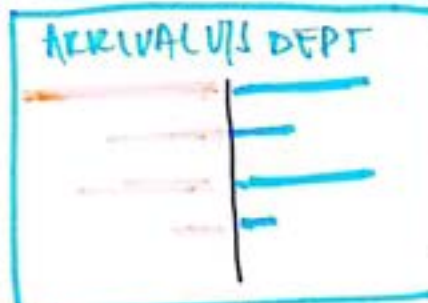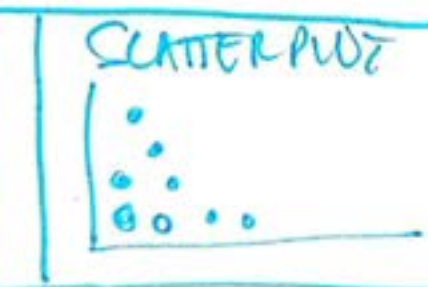
Team member Name

Zuha Aqib

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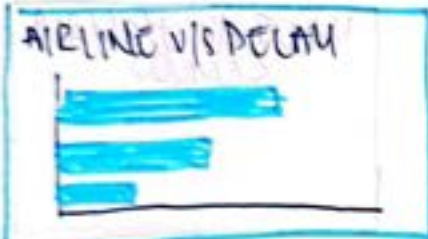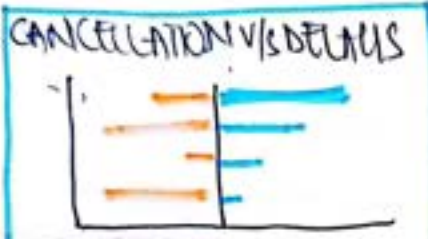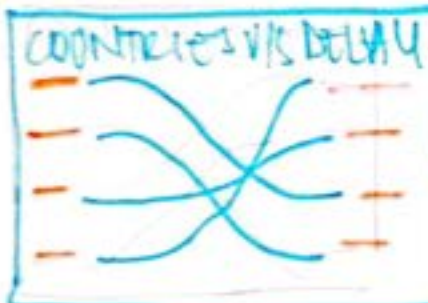
4

BI DESIGN SPRINT - IDEATE

Crazy 4s - Sketch ideas that might be a BI solution
Each member will create this individually.

AVG DELAY	TOTAL DELAY	CITY HIGHER	MONTH HIGHEST

AIRLINE V/S DELAY

CANCELLATION V/S DELAYS

COUNTRIES V/S DELAY

ARRIVAL V/S DEPT

TIME SERIES

SCATTER PLOT

FLIGHT NAME 4
- [ ] ___
- [ ] ___
- [ ] ___

Year ___ ⌄
Month ___ ✓
Day ___ ⌄

Team member Name

Zehra

Ahmed

1

2

3

Choose your favourite idea from the Crazy 4s. Make it as a group!

Design Thinking for BI
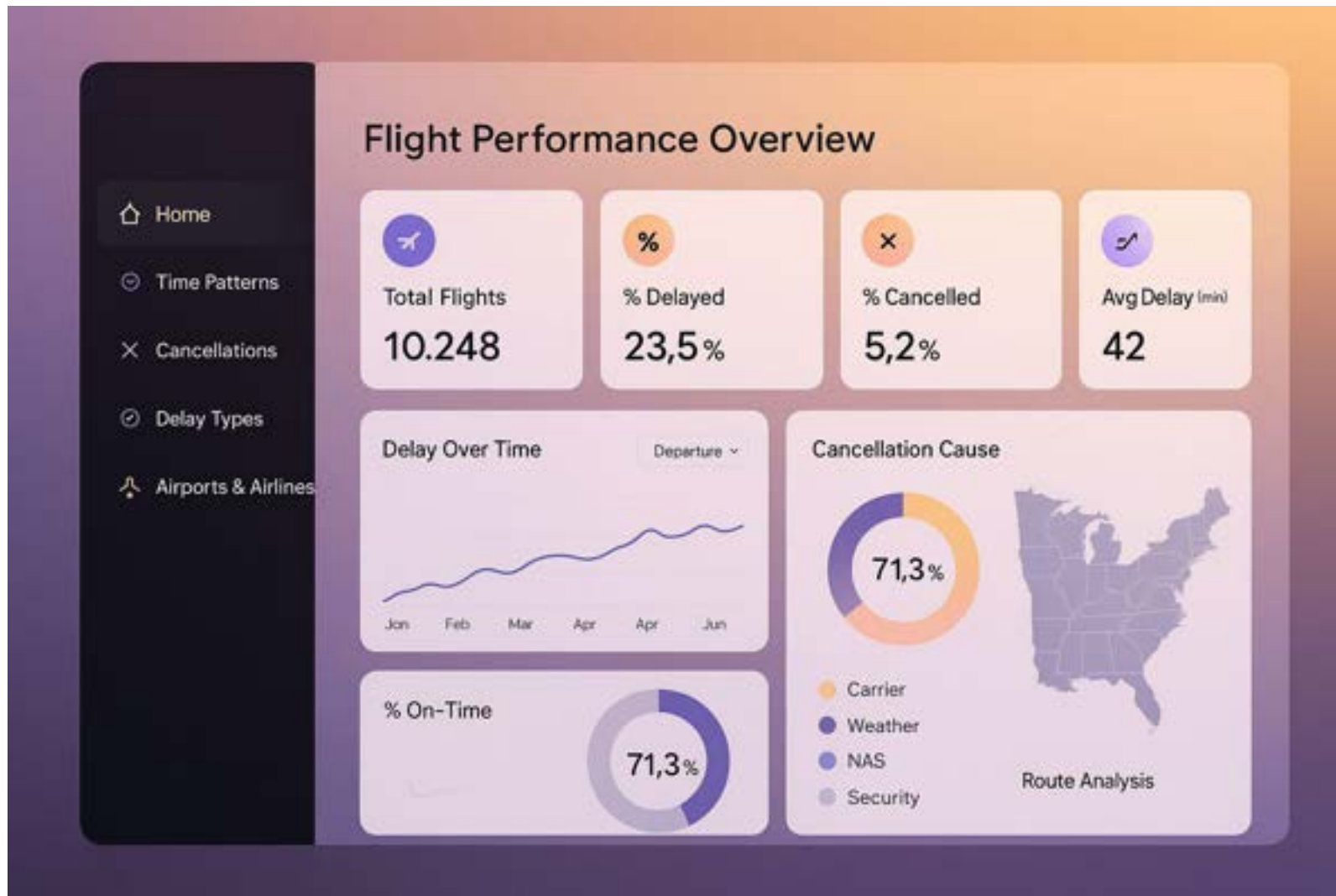
BI DESIGN SPRINT - TEST

Upload the prototype picture & ask your AI expert for feedback!

> Label axes and charts more clearly (e.g., Y-axis for bar/line graphs).
> Replace "Qtr 1, Qtr 2…" with actual months or dates for clarity.
> Add titles/captions to each graph for quick interpretation.
> Consider tooltips or hover info in the final version for extra data detail.
> Group related metrics together visually (e.g., all delay-related charts in one area).

What can you improve? Reflect as a team!

> Use the good practices we learned in class.
> Make a readable and clean dashboard
> There is a repetition between filters and charts that would act as a filter.
> Positioning of the charts.
> Add more charts.