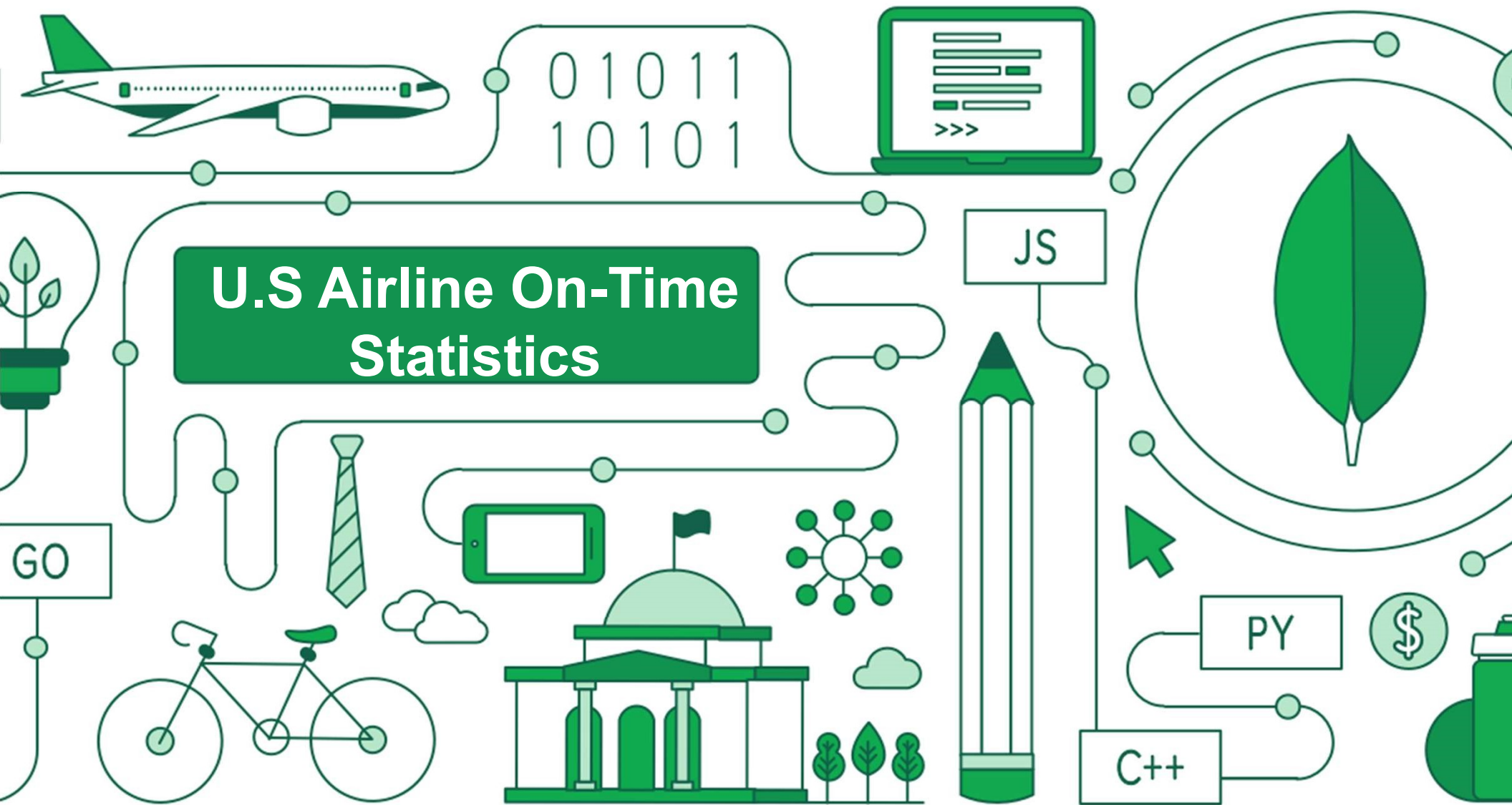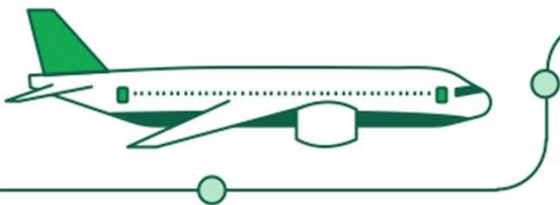# U.S Airline On-Time Statistics

BACKGROUND

Objective: Reporting four U.S. Airlines (American Airlines, Southwest Airlines, Delta Airlines, United Airlines) on-time performance (December-2020) in order to help the airline companies and customers make better business decisions and travel plans.
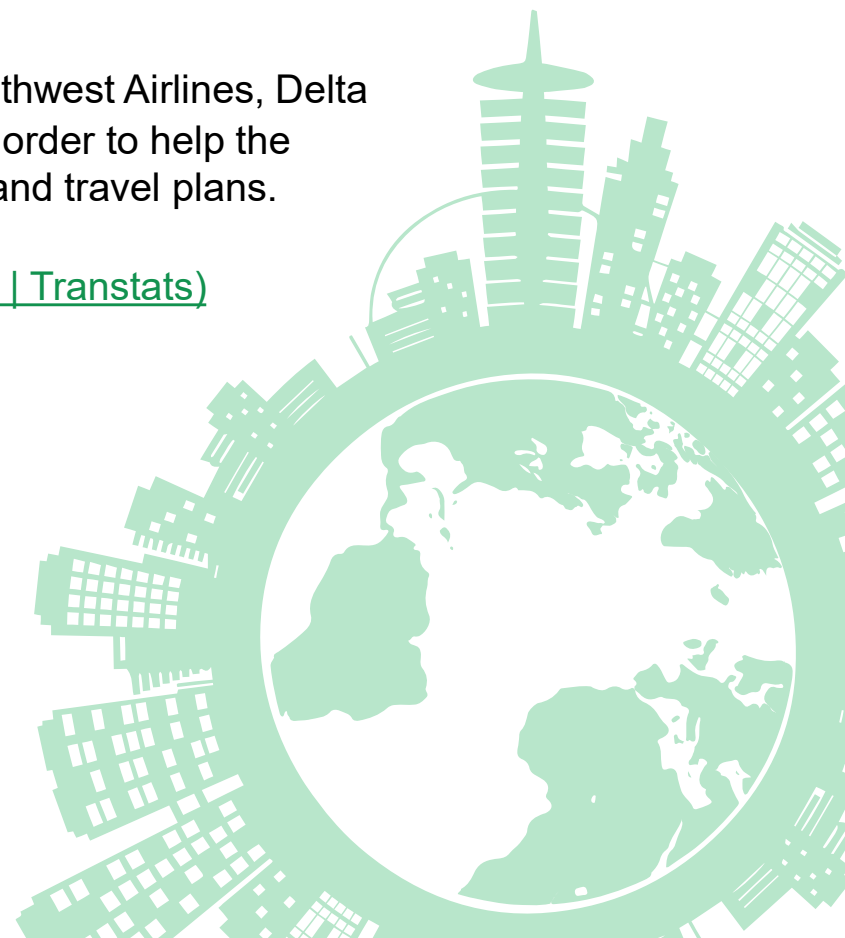
Data Source: Bureau of Transportation Statistics (RITA | BTS | Transtats)
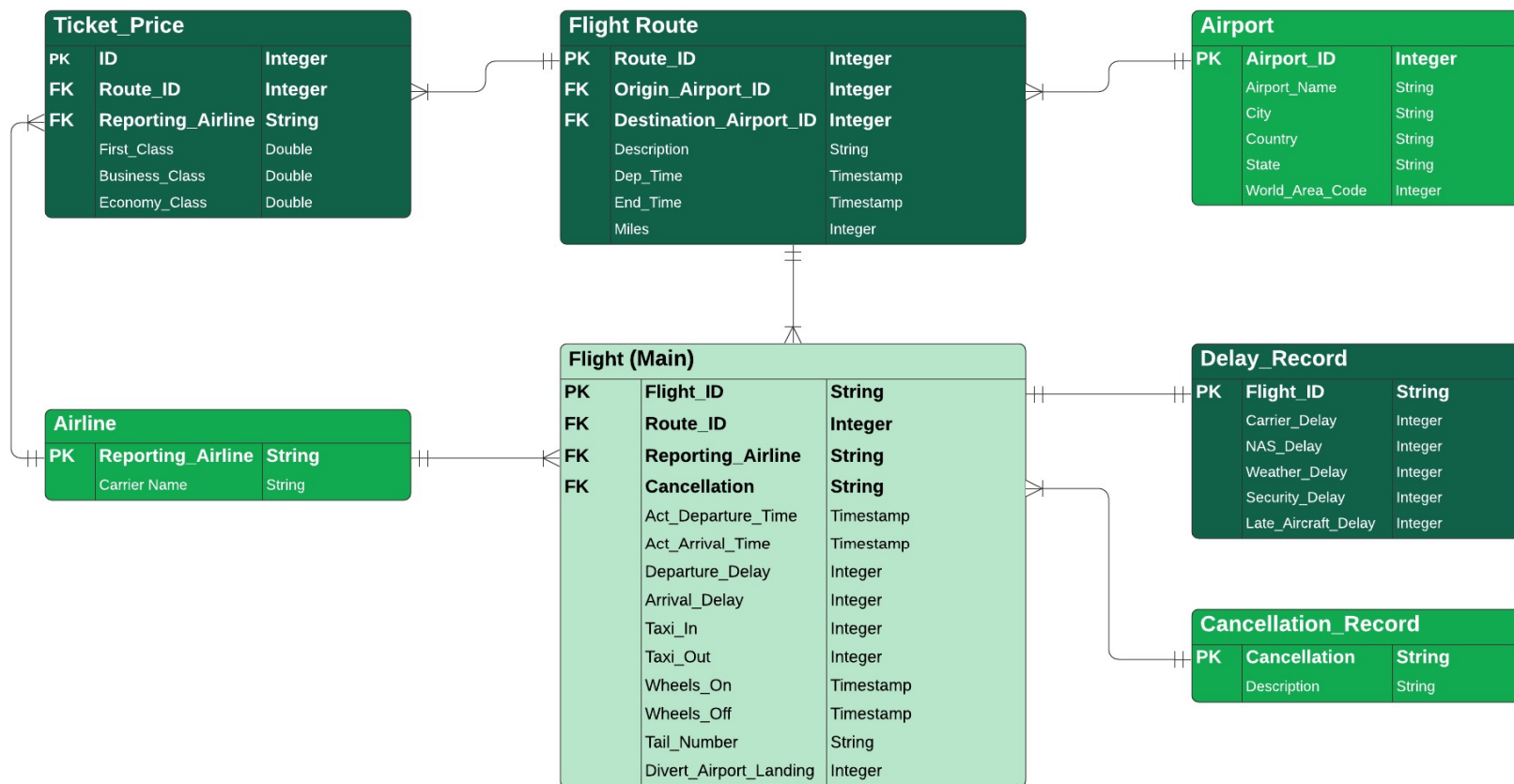
Target Platform: MongoDB

Tools: MongoDB Compass and NoSQL Manager for MongoDB

Variables:
- Route Variety
- Time Variety
- Passenger Revenues
- Delays
- Cancellations
- Taxi-In and Taxi-Out Time

ARCHITECTURE DIAGRAM

Ticket_Price

PK	ID	Integer
FK	Route_ID	Integer
FK	Reporting_Airline	String
	First_Class	Double
	Business_Class	Double
	Economy_Class	Double

Flight Route

PK	Route_ID	Integer
FK	Origin_Airport_ID	Integer
FK	Destination_Airport_ID	Integer
	Description	String
	Dep_Time	Timestamp
	End_Time	Timestamp
	Miles	Integer

Airport

PK	Airport_ID	Integer
	Airport_Name	String
	City	String
	Country	String
	State	String
	World_Area_Code	Integer

Airline

PK	Reporting_Airline	String
	Carrier Name	String

Flight (Main)

PK	Flight_ID	String
FK	Route_ID	Integer
FK	Reporting_Airline	String
FK	Cancellation	String
	Act_Departure_Time	Timestamp
	Act_Arrival_Time	Timestamp
	Departure_Delay	Integer
	Arrival_Delay	Integer
	Taxi_In	Integer
	Taxi_Out	Integer
	Wheels_On	Timestamp
	Wheels_Off	Timestamp
	Tail_Number	String
	Divert_Airport_Landing	Integer

Delay_Record

PK	Flight_ID	String
	Carrier_Delay	Integer
	NAS_Delay	Integer
	Weather_Delay	Integer
	Security_Delay	Integer
	Late_Aircraft_Delay	Integer

Cancellation_Record

PK	Cancellation	String
	Description	String

Extract
Load
Transformation

VISUALIZATIONS

MongoDB Chart

MOVING

Migrate data to new tables
- Delete records from original table

Appended Tables
Refresh Data Lake

PROCESS DATA
- Create composite Flight_ID
- Retain four major airlines
- Delete redundant columns

LOAD
- Dimension Tables
- Fact Table Data

PRE-LOAD
- Unzip file
- Create Connections

MINE DATA

Bureau of Transportation
- Fact table
- Dimension tables

MongoDB