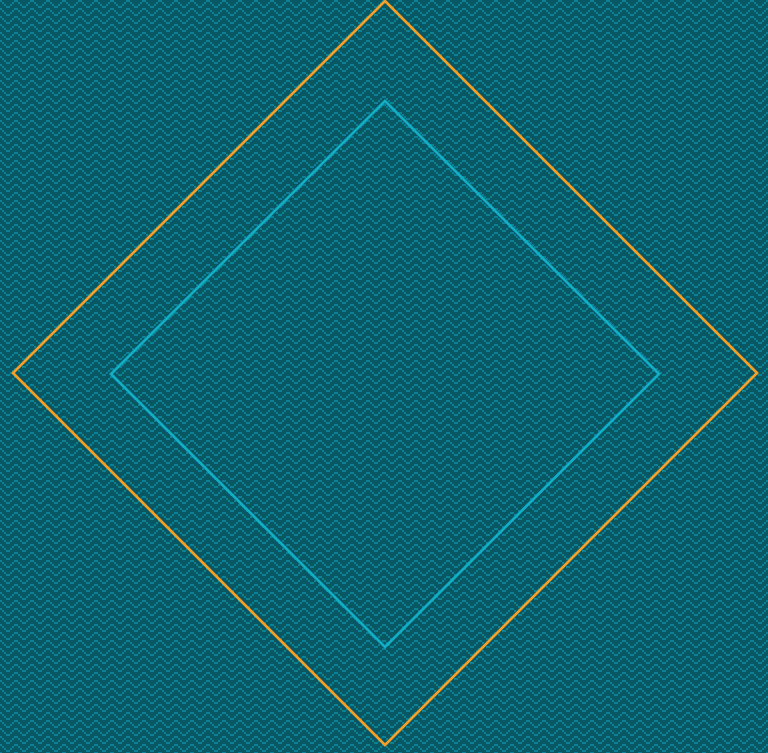
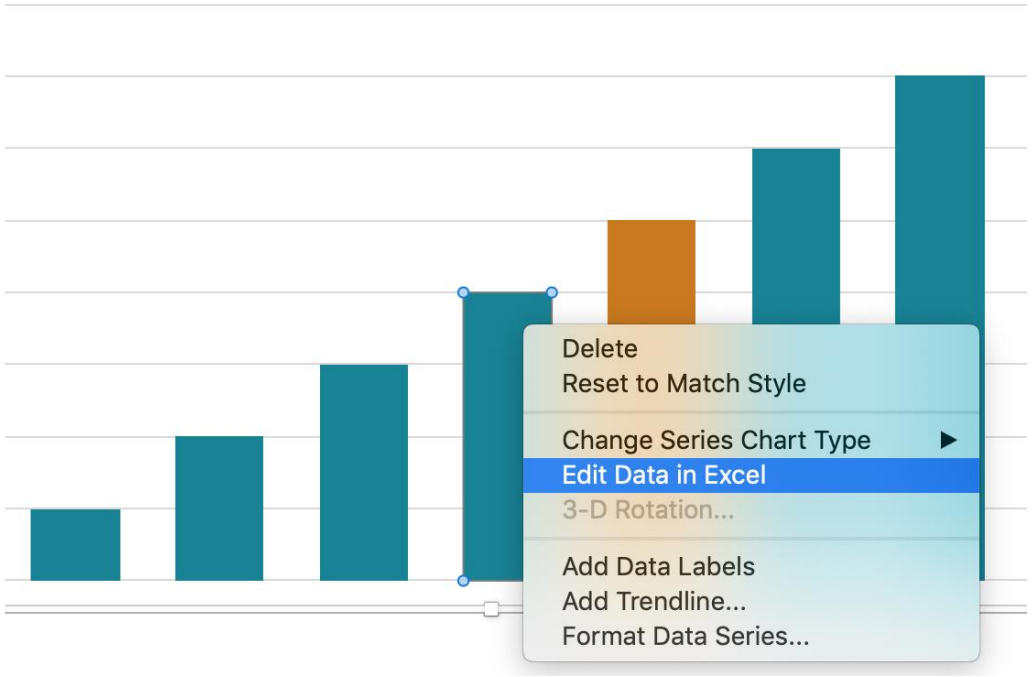


DATA MARTS

CAREMETRIX

Data Marts Overview

We have designed a total of **4 data marts**, each serving a specific analytical purpose and derived from the **Synthea synthetic healthcare database**. These marts are structured in a **schema**, where each fact table is connected to a set of dimension tables. The data is stored in **Parquet format** in an **AWS S3**,and queried using **Amazon Athena** for building reports.



Patient Data Mart

Purpose: To provide a 360-degree view of patient demographics and health status.
Fact Table: fact_patient_e

A surrogate key (fact_patient_id) is used as the primary key.

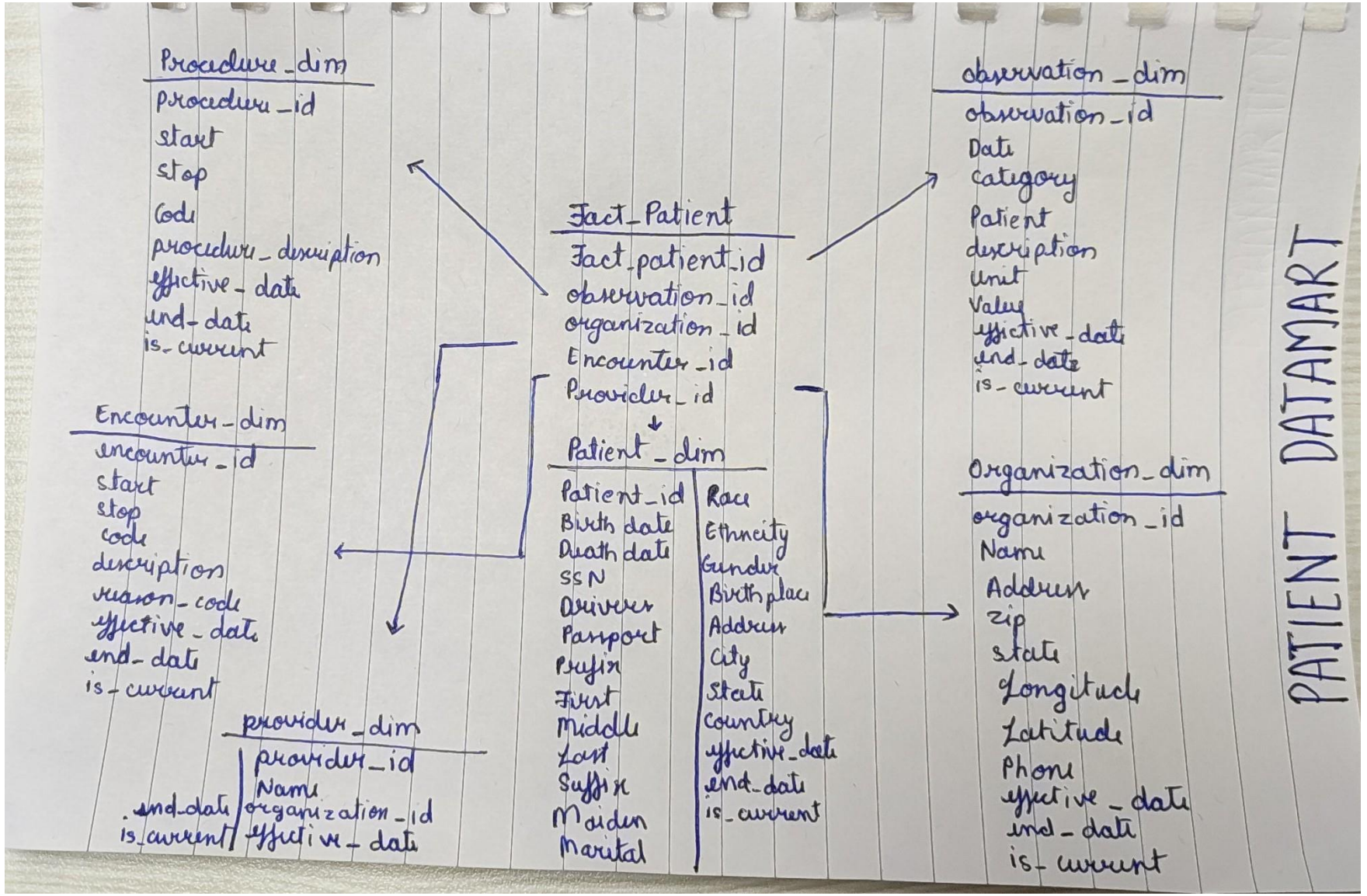
Dimensions Used:

1. dim_patient
2. dim_encounter
3. dim_observation
4. dim_provider
5. dim_procedure
6. dim_organization

Use Cases:

- Population health analysis
- Gender-based health trends
- Age-based disease prevalence

Diagram


Procedure_dim
procedure_id
start
stop
Code
procedure_description
effective_date
end_date
is_current
Encounter_dim
encounter_id
start
stop
code
description
reason_code
effective_date
end_date
is_current
provider_dim
provider_id
Name
organization_id
effective_date
end_date
is_current
Fact_Patient
Fact_patient_id
observation_id
organization_id
Encounter_id
Provider_id
Patient_dim
Patient_id
Birth date
Death date
SSN
Driverer
Passport
Prefix
First
Middle
Last
Suffix
Maiden
Marital
Race
Ethnicity
Gender
Birthplace
Address
City
State
Country
effective_date
end_date
is_current
observation_dim
observation_id
Date
category
Patient
description
Unit
Value
effective_date
end_date
is_current
Organization_dim
organization_id
Name
Address
zip
state
Longitude
Latitude
Phone
effective_date
end_date
is_current
PATIENT DATAMART

Clinician Data Mart

Purpose: To provide insights into clinician activities, procedures performed, and medication prescribed across the healthcare network.
Fact Table: fact_clinician
Surrogate key (fact_clinician_sk)

Key Metrics:

- Number of procedures performed per provider
- Count of medications prescribed
- Patient coverage per clinician

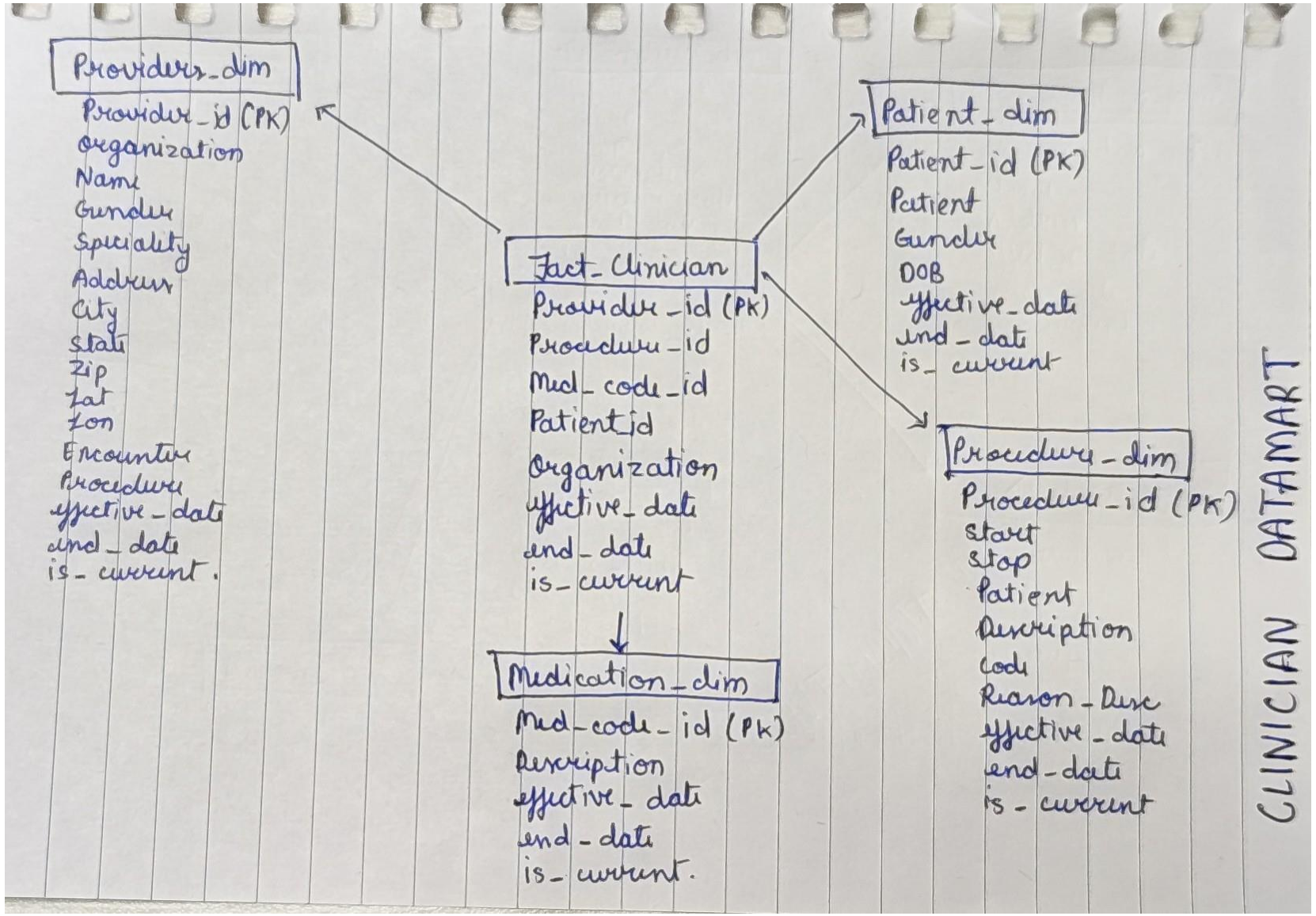
Dimensions Used:

- dim_provider
- dim_procedure
- dim_medication
- dim_patient
- dim_organization

Use Cases:

- Performance evaluation of clinicians
- Tracking procedure and medication trends
- Provider-patient engagement analysis

Diagram


Providers_dim
Provider_id (PK)
Organization
Name
Gender
Speciality
Address
City
State
Zip
Lat
Lon
Encounter
Procedure
effective_date
end_date
is_current.
Fact_Clinician
Provider_id (PK)
Procedure_id
Med_code_id
Patient_id
Organization
effective_date
end_date
is_current
Medication_dim
Med_code_id (PK)
Description
effective_date
end_date
is_current.
Patient_dim
Patient_id (PK)
Patient
Gender
DOB
effective_date
end_date
is_current
Procedure_dim
Procedure_id (PK)
start
stop
Patient
Description
code
Reason_Desc
effective_date
end_date
is_current
CLINICIAN DATAMART

TRANSACTION
Data Mart

Purpose: To capture financial transactions, insurance claims, and hospital-patient-payer relationships for operational and financial reporting.
Fact Table: fact_transaction
Surrogate key(fact_transaction_sk)

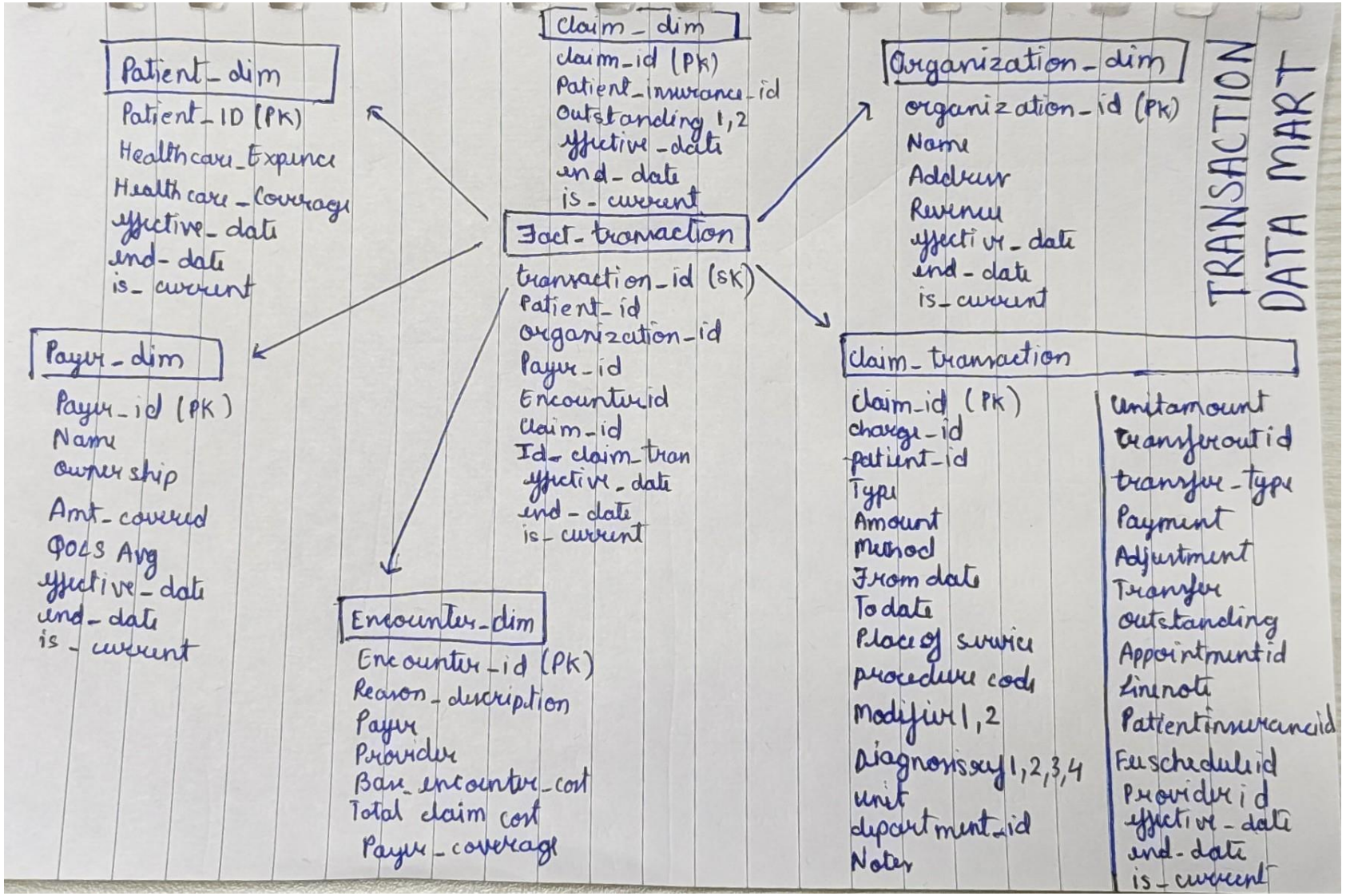
Dimensions Used:

1. dim_patient
2. dim_organization (Hospital)
3. dim_payer
4. dim_encounter
5. dim_claim
6. dim_claim_transaction

Use Cases:

- Revenue cycle analysis
- Insurance claim performance
- Hospital-payer financial relationships

Diagram


TRANSACTION DATA MART
Patient_dim
Patient_ID (PK)
Healthcare_Expunce
Healthcare_Coverage
effective_date
end_date
is_current
Claim_dim
claim_id (PK)
Patient_insurance_id
Outstanding 1,2
effective_date
end_date
is_current
Organization_dim
organization_id (PK)
Name
Address
Revenue
effective_date
end_date
is_current
Fact_transaction
transaction_id (SK)
Patient_id
organization_id
Payer_id
Encounter_id
claim_id
Id_claim_tran
effective_date
end_date
is_current
Payer_dim
Payer_id (PK)
Name
ownership
Amt_covered
POLS Avg
effective_date
end_date
is_current
Encounter_dim
Encounter_id (PK)
Reason_description
Payer
Provider
Base_encounter_cost
Total claim cost
Payer_coverage
claim_transaction
claim_id (PK)
charge_id
patient_id
Type
Amount
Method
From date
To date
Place of service
procedure code
Modifier 1,2
Diagnosis 1,2,3,4
unit
department_id
Note
Unitamount
transferoutid
transfer_type
Payment
Adjustment
Transfer
outstanding
Appointmentid
Linenote
Patientinsuranceid
Fuscheduleid
Providerid
effective_date
end_date
is_current

APPOINTMENT
Data Mart

Purpose: To manage and analyze patient appointment schedules, reasons for visits, and related clinical activities.

Fact Table: fact_appointment
Surrogate key(fact_appointment_sk)

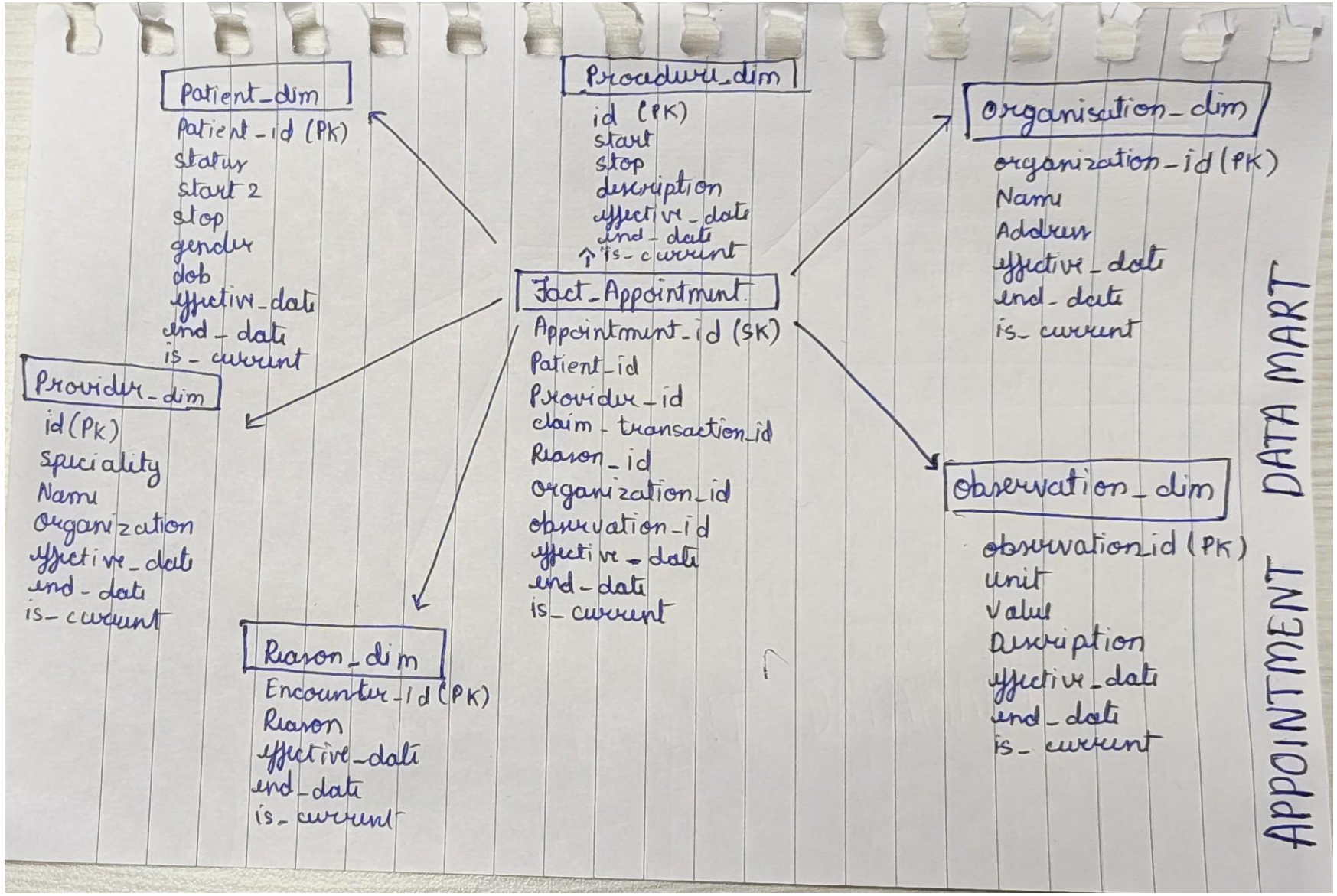
Dimensions Used:

1. dim_patient
2. dim_provider
3. dim_reason
4. dim_organization
5. dim_observation
6. dim_procedure

Use Cases:

- Appointment management efficiency
- Identifying common reasons for visits
- Improving patient scheduling and resource utilization

Diagram


Patient_dim
Patient_id (PK)
status
start 2
stop
gender
dob
effective_date
end_date
is_current
Procedure_dim
id (PK)
start
stop
description
effective_date
end_date
is_current
organisation_dim
organization_id (PK)
Name
Address
effective_date
end_date
is_current
Provider_dim
id (PK)
speciality
Name
Organization
effective_date
end_date
is_current
Fact_Appointment
Appointment_id (SK)
Patient_id
Provider_id
claim_transaction_id
Reason_id
Organization_id
observation_id
effective_date
end_date
is_current
observation_dim
observation_id (PK)
unit
Value
Description
effective_date
end_date
is_current
Reason_dim
Encounter_id (PK)
Reason
effective_date
end_date
is_current
APPOINTMENT DATA MART

Thank You