CalMHSA

California Mental Health Services Authority

CALMHSA CREATING REPORTS IN SMARTCARE PART 2 DATA ANALYSIS AND DATA WAREHOUSE

INTENDED AUDIENCE

- This presentation is aimed toward county technical staff who will be responsible for creating ad hoc and custom reports within the SmartCare EHR or the data warehouse

AGENDA

- CalMHSA Data Analysis Future Vision
  - Examples of Data Dashboards
- Data Warehouse Introduction
  - Timelines for county data warehouse server installation
  - DW servers and characteristics
  - County PowerBI licenses
- SmartCare Datawarehouse Data Model
  - Fact and Dimension tables available at go live
  - Frequency of refresh
- How to Use PowerBI to create data dashboards CalMHSA examples – Org Hierarchy

CALMHSA DATA ANALYSIS FUTURE VISION

CALMHSA DATA ANALYSIS

➢ CalMHSA value proposition – this is a collective

➢ Our analysts creating tools to help you manage your business

➢ Staying on brand – the more you customize the more you are on your own

➢ Capability to create your own reports and dashboards – but we will be very busy building analytical tools for everyone

CALMHSA DATA ANALYSIS

Proof of Concept :

➢ Looking at results based on a county organizational hierarchy – using Power BI

➢ Looking at service information across the organization – Power BI Dashboard
   o Datapalooza

➢ Building the organizational hierarchy in SmartCare

➢ Demo built on sample data, not the SmartCare Datawarehouse

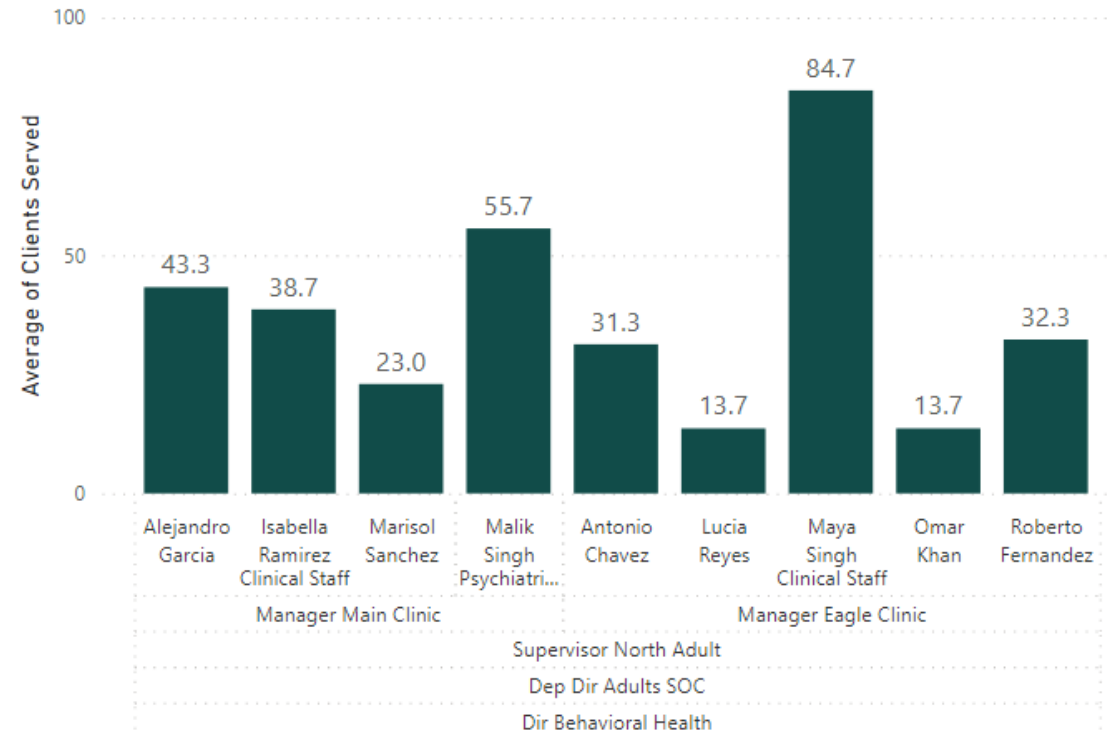# ORGANIZATION HIERARCHY INDIVIDUAL DRILL DOWN

County BHRS Direct-Service Staff Drill Down (Demo Data)

Select Organization Structure
- ☐ ■ Dir Behavioral Health
  - ☐ ■ Dep Dir Adults SOC
    - ☐ ■ Supervisor North Adult
      - ⊞ ■ Manager Eagle Clinic
      - ⊞ ■ Manager Main Clinic
  - ☐ ☐ Dep Dir Children SOC
    - ⊞ ☐ Supervisor Downtown Childrens

Select Time Period: Multiple selections ⌄

Average Clients Served Per Staff by Organization Level
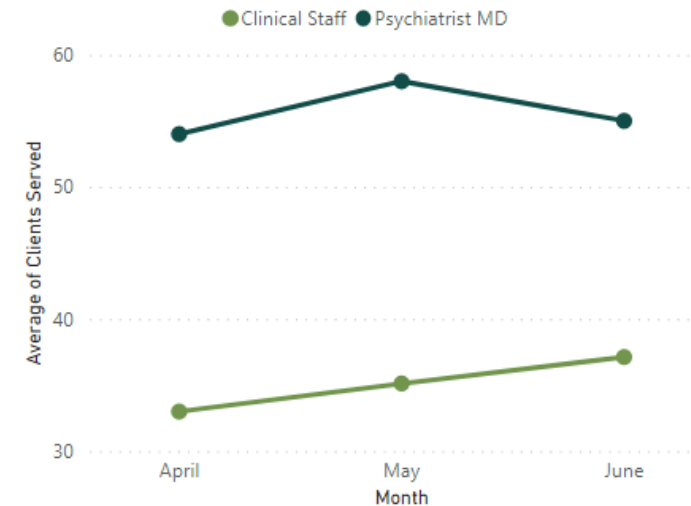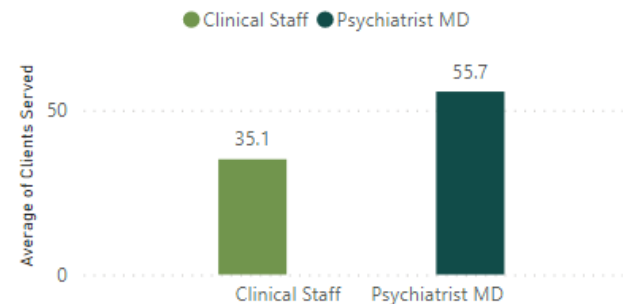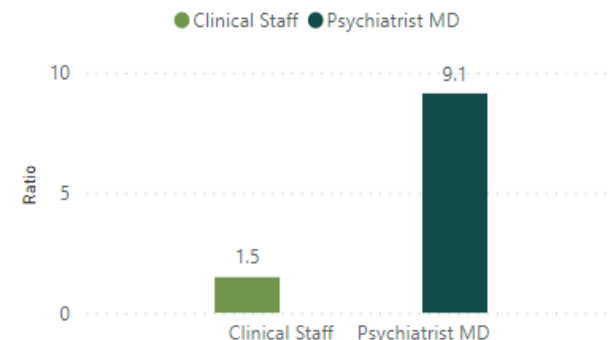
Staff	Average of Clients Served
Alejandro Garcia	43.3
Isabella Ramirez Clinical Staff	38.7
Marisol Sanchez	23.0
Malik Singh Psychiatri...	55.7
Antonio Chavez	31.3
Lucia Reyes	13.7
Maya Singh Clinical Staff	84.7
Omar Khan	13.7
Roberto Fernandez	32.3

Manager Main Clinic | Manager Eagle Clinic
Supervisor North Adult
Dep Dir Adults SOC
Dir Behavioral Health

How to Interpret:
This page allows users to engage with the hierarchy organization structure through interactive drill down features on the chart itself, using the up and down arrows that appear when hovering over the chart. Additional filtering can be applied through the slicer on the left "Select Organization Level"

COUNTY WIDE SUMMARY DASHBOARD

Proof of Concept :

➤ Positions define the organizations "Jobs"

➤ The Hierarchy defines where each position reports within the organization
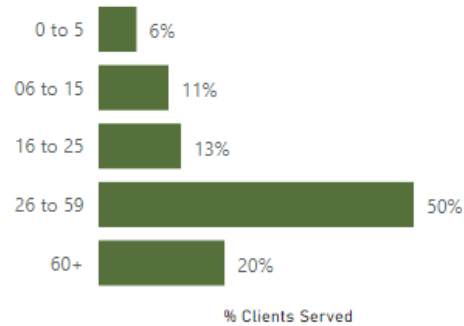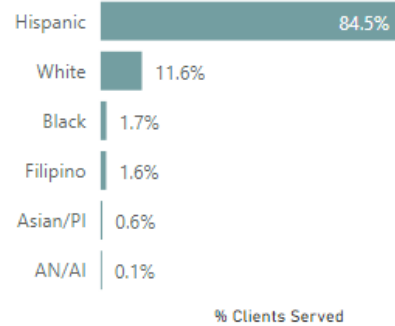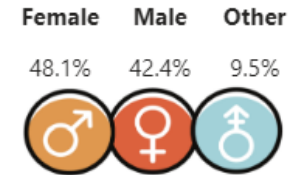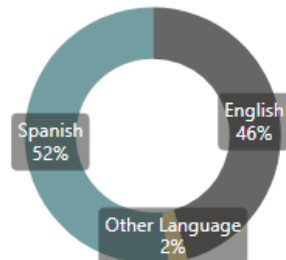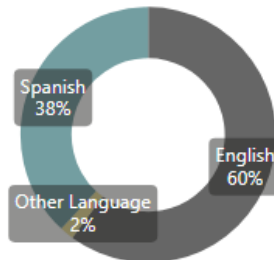
➤ Each position has a start date and end date to track historical organization structure
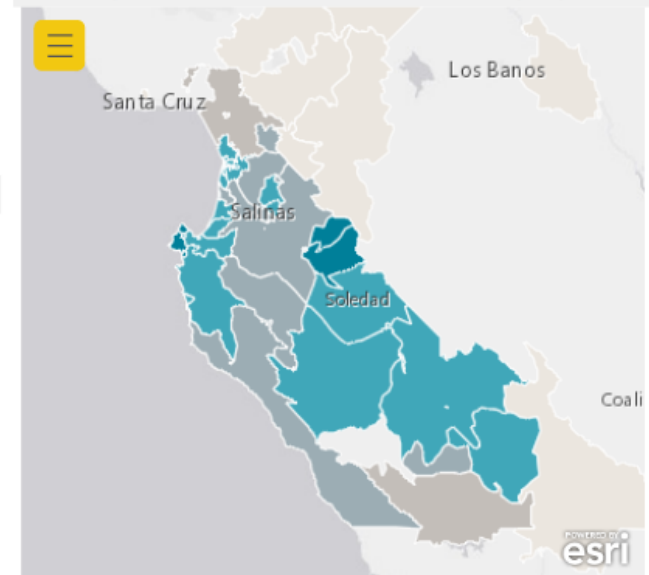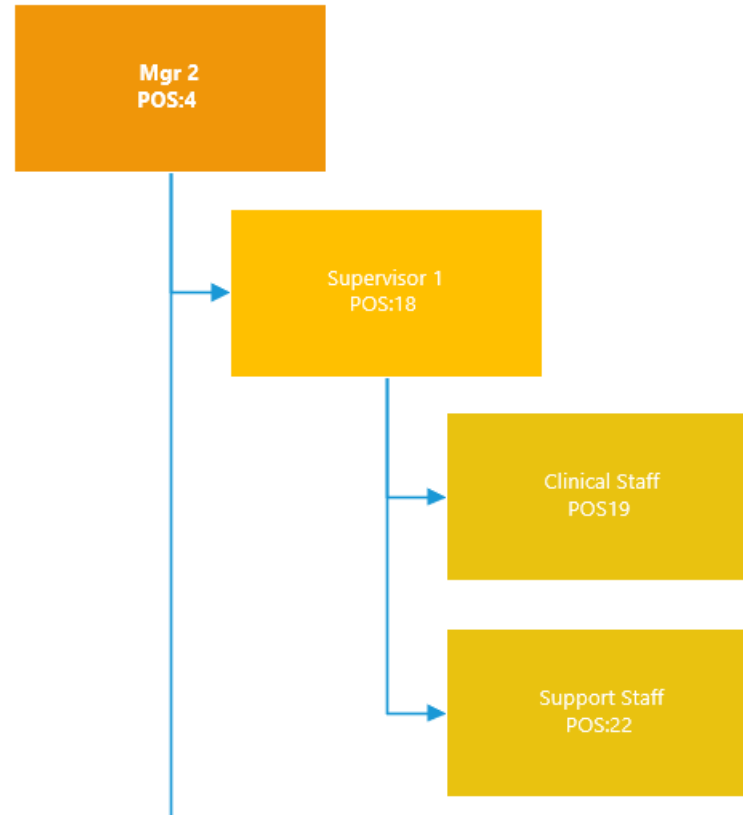
BUILDING THE ORGANIZATION HIERARCHY

Proof of Concept :

- ➤ Staff members do specific jobs within the organization

- ➤ Staff members also have start and end dates to reflect their history within the organization

- ➤ Some positions may be vacant. 1 FTE is available but has not been filled yet

Mgr 2
POS:4

Mgr 2 is Maria
Start Date 3/1/2021

Supervisor 1
POS:18

Supervisor 1 is Jose
Start Date 8/1/2019

Clinical Staff
POS19

VACANT

Support Staff
POS:22

Support Staff is Max
Start Date 5/1/2020
End Date : 9/1/2021

BUILDING THE ORGANIZATION HIERARCHY

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Proof of Concept :

➢ We saw a Power BI view using Org data

➢ Sample of a more traditional roll up report using the management hierarchy

Clients Served and Productivity Data
July 1 to Sep 30

	Caseload	Unique Clients Served	Avg Daily Clients	Svc Value	Pct Productive
Dir BH	5296	3196		$2,891,213	65%
Mgr Region 1	528	378		$612,991	61%
Supervisor 1	124	85		$128,695	58%
Practitioner 1	45	25	5.2	$33,894	71%
Practitioner 2	30	22	2.3	$29,789	45%
Practitioner 3	49	41	4.5	$65,012	52%
Supervisor 2	125	102		$185,076	74%
Practitioner 4	26	19	5	$68,021	77%
Practitioner 5	52	43	3.9	$42,134	69%
Practitioner 6	47	41	5.3	$74,921	81%
...	...	...	...	...	...

Page : 1

LIVE SmartCare demo – building the Hierarchy - Prototype

DATA WAREHOUSE

DATA WAREHOUSE

- Separate database that will be populated on a nightly basis from county PROD database
- County data warehouse will be online within 30 days of the 7/1 go live
- There is no front-end UI (user interface)
- Data can be queried and visualized with additional software such as PowerBI, Tableau, other reporting tools, etc.
- There are example Power BI reports at go live for reference
- Data warehouse table structure is different than the SmartCare EHR table structure
- There are numerous fact and dimension tables
  - Fact tables contain measurable data such as keys, integers, etc.
  - Dimension tables contain descriptive information

POWER BI DESKTOP FREE DOWNLOAD

- https://powerbi.Microsoft.com/en-us/downloads
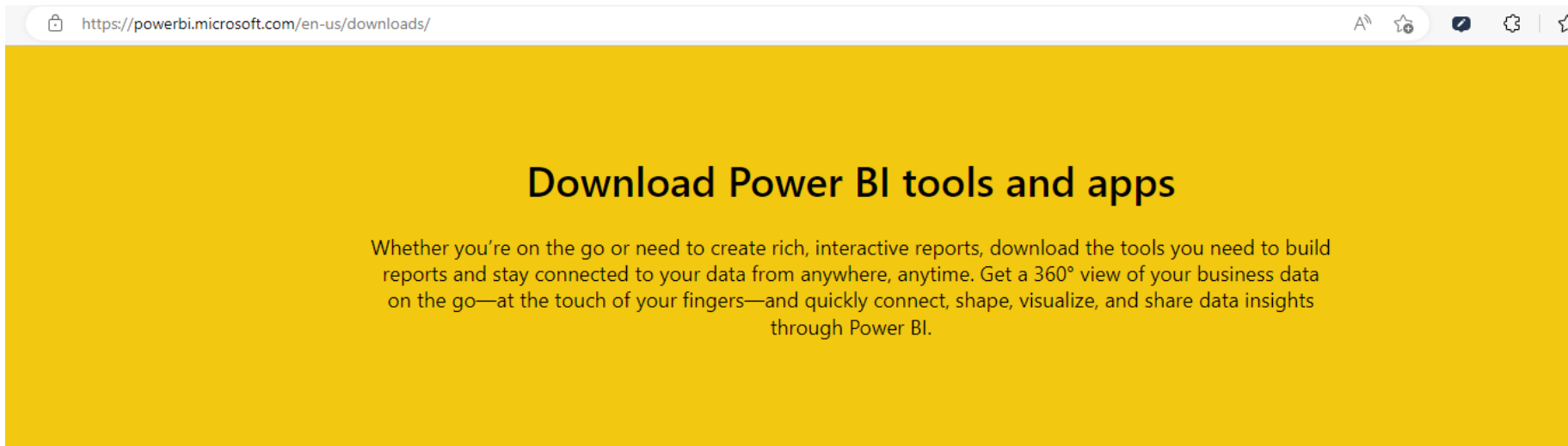
- Is free
- Has most functionality of Power BI Pro
- Does **NOT** allow users to share reports

POWER BI PRO DOWNLOAD

https://powerbi.microsoft.com/en-us/power-bi-pro/
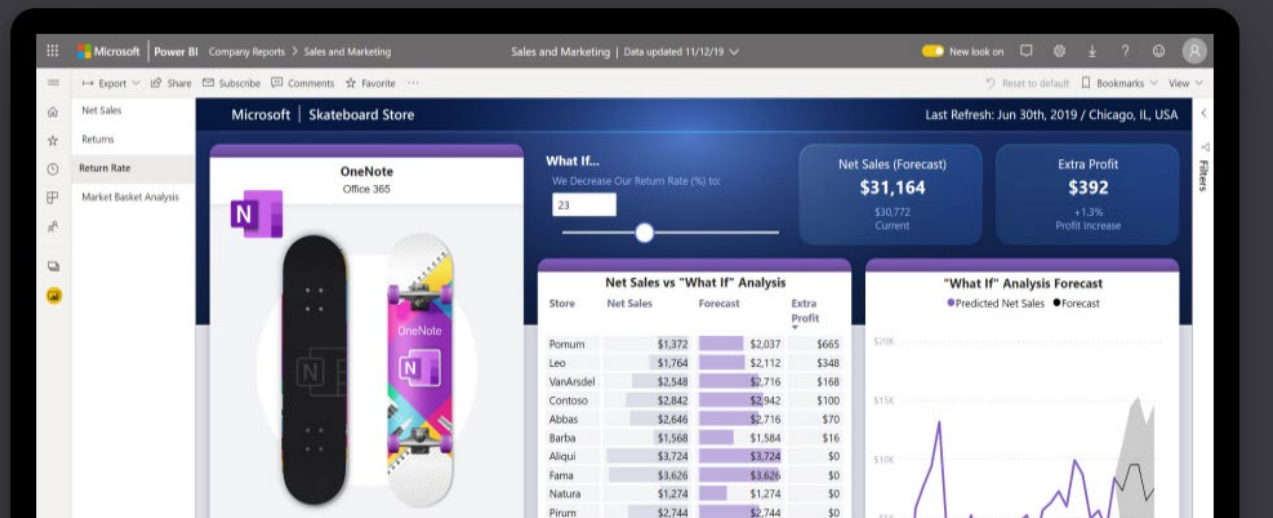
- Recommended for enterprise solutions
- Allows users to share reports
- Is not free but does have a free trial

SMARTCARE POWER BI STARTER REPORTS

SmartCare® Power BI Starter Package

Overview of Included Reports

SmartCare's Power BI Starter Package is Streamline's base reporting package that provides our Data Warehouse customers the ability to see how business intelligence and insights can be delivered. The following template reports are provided as a launching point for customers to introduce the insights and added reporting capabilities the Data Warehouse provides using the included data from SmartCare.

Catalog of Templated Reports

Average # of Days from Date of Service to Billed Date - analyzes how many days it took for your organization to bill out services, which is a critical measure that impacts an organization's Accounts Receivable and cash flow.

Average Number of Days from Request for Service to Enrolled - analyzes the average number of days from program request to program enrollment, helping identify potential bottlenecks and allow the organization to capture a true sense of capacity and availability in regards to how quickly services can begin within the organization.

Caseload Size by Program – analyzes and determines the caseload volume of specific programs and their staff members.

Clients Not Seen in X Days by Program and Clinician - analyzes the average number of days that clients have not been seen by specific providers in order to quickly identify client records which may be eligible for discharge.

Diagnosis Analysis - analyzes key aspects relating to client diagnosis, including information regarding cost, number of clients, and average GAF score at LOS band.

Health Assessments Over Time – analyzes data from certain assessment tests (i.e. PHQ-9) to see if treatment plans for certain conditions are effective or not over time.

Length of Stay in Services by Program – analyzes the average length of time a client, or panel of clients, are enrolled in a specific program.

Program Readmission Rate – analyzes 30-day readmission rates by specific programs across time.

Step Up/Step Down Rate – analyzes client progress at the individual and programmatic level in terms of their transition from inpatient to outpatient (Step Up) vs outpatient to inpatient (Step Down) care.

Write Offs by adjustment reason - analyzes lost revenue by the organization due to adjustments and why the revenue is lost. The various graphs within the dashboard provides end users to analyze write-offs as a point in time as well as movement over time, giving leadership teams the opportunity to assess current viability, as well as take a data driven approach to develop a team-based strategy that will proactively position the organization for long term sustainability.

DATA WAREHOUSE FACT AND DIMENSION TABLE INFO

- Data Warehouse Data Dictionary has been uploaded to CalMHSA member portal

DATA WAREHOUSE DIMENSION TABLE EXAMPLE

- Example of Client Dimension table in Data Warehouse Data Dictionary

Table Name	Ext Property Name	Ext Property value
DimClient		
	Display Name	Client
	Table Description	Client demographic, coverage and health information at point in time. Will only have monthly snapshot of client data after DW go
	Table Type	Dimension

Table Name	Column Name	Data Type	Description	Type	Display Folder	Display Name	ETL Rules	Example Values	SCD Type
DimClient									
	AddressLine1	varchar(100)	address line 1		Demographics	address line 1	If no residence address including address of correctional facility then 'Jail' & 'Homeless' are sometime entered in this fie	3630 CAPITAL AVE SW	2
	AddressLine2	varchar(100)	address ine 2		Demographics	address line 2		APT 1	2
	AffiliateId	smallint	Numeric affiliate id			AffiliateId		100,200	business key
	AnnualHouseholdIncome	money	Client AnnualHouseholdIncome		Personal Status	Annual household income		55000	1
	BirthDate	date	Date of birth for an internet customer		Demographics	birth date		12/18/1990	1
	CareManagementClientId	int	Care management client id if the client exists in the care management system			Care Management client ID		123,456...	1
	City	varchar(50)	client city of residence		Demographics	city		Battle Creek, Benton Harbor	2
	CityLatitude	decimal(8,5)	Client city latitude coordinate			city latitude		32.4567	2
	CityLongitude	decimal(8,5)	Client city longitude coordinate			city longitude		-132.4567	2
	ClientFirstName	varchar(50)	client first name		Demographics	client first name		Suhail, Javed	1
	ClientID	int	Client business key from source system			ClientID		56123,78123	business key
	ClientKey	int	Surrogate primary key			ClientKey		1, 2, 3...	surrogate key
	ClientLastName	varchar(50)	client last name		Demographics	client last name		Ali, Husain	1
	CorrectionStatus	varchar(200)	client current prison status, if any		Demographics	correction status		In prison,Consumer refused to provide information,Minor (under age 18) who was referred by the	2

DATA WAREHOUSE FACT TABLE EXAMPLE

- Example of Charges Fact table in Data Warehouse Data Dictionary

Table Name	Ext Property Name	Ext Property value
FactCharges		
	Display Name	Fact charges
	Enable Inferred Member Support?	Y
	Execute Group Number	1
	Table Description	Service charges allocated to individual client coverage plan (e.g. medicaid) and the amount of charges paid by the coverage paye
	Table Type	Fact

Table Name	Column Name	Data Type	Description	Type	Display Folder	Display Name	ETL Rules	Example Values	SCD Type	
FactCharges										
	Adjustment	money	Adjustment amount		Amounts	Adjustment				
	AffiliateKey	smallint		business key						
	BillingCodeKey	smallint	Key to DimBillingCode		key	Dim Billing Code Key		1, 2, 3		
	BillingDateKey	int	Date when plan payor was billed for charged amount		key	Dim Billing Date Key		1, 2, 3		
	BKChargeId	int		business key						
	BKServiceId	int	Degenerate service business id to service fact table. Used to join all other dimensions without having to physically materializ	business key	key	BKServiceId		1, 2, 3		
	BKServiceSource	varchar(10)	Is the service performed internally or sub-contracted out externally	business key	Exclude from cube	BKServiceSource	In order to have a unique BK key from source system need to combine Servicesource with service id and affiliate.			
	Charge	money	Service charge		Amounts	Charges				
	ClaimCleanDateKey	int								
	ClaimPaidDateKey	int								
	ClaimReceiptDateKey	int								
	ClientKey	int								
	CoveragePlanKey	smallint	Key to DimCoveragePlan		key	Dim Coverage Plan Key		1, 2, 3		
	DeleteAuditKey	int								
	DiagnosisSetKey	int	Key to DimDiagnosisSet		key	Diagnosis Set Key		1, 2, 3		
	InsertAuditKey	int	Key to Audit dimension for row insertion		key	Insert Audit Key	Standard auditing	1, 2, 3		
	LocationKey	smallint	Key to DimLocation		key	Location Key		1, 2, 3		
	OrganizationKey	smallint	Key to DimOrganization		key	Organization Key		1, 2, 3		
	PaidDateKey	int	Date when plan payor paid partial or full charged amount		key	Dim Payment Date Key		1, 2, 3		

DATA WAREHOUSE DIMENSION TABLES

- Affiliate
- AgeBand
- Audit
- Billing Code
- Client
- ClientEpisodeTimelineStatus
- ClinicalQuestionAnswer
- Comment
- CoveragePlan
- Date
- DiagnosisSet

- EventType
- HospitalizationStatus
- Insured
- LengthOfStayBand
- Location
- Organization
- Procedure
- Program
- Status
- ServiceSource
- ServiceStatus

DATA WAREHOUSE FACT TABLES

- Charges
- ClientCoveragePlan
- ClientEpisodeTimeline
- ClientEvent
- ClientProgram
- ClinicalDiagnosis
- ClinicalMeasure
- Hospitalization
- Service

I want to report on Orders

Star schema

Warehouse (dimension table)

WAREHOUSE_ID	OFFICE NAME	CITY	MANAGER NAME
1	Texas	Houston	John
2	Florida	Orlando	Phil

Items (dimension table)

ITEM_ID	ITEM NAME	ITEM COLOR	•••
1	Sedan	Blue	•••
	Truck	Brown	•••

Date (dimension table)

DATE_ID	MONTH	YEAR	QUARTER
202005	May	2020	Q2

Orders (fact table)

VALUE DATA ——— DIMENSION ATTRIBUTE DATA

ORDER ID	ORDER PROFIT	ORDER QUANTITY	ITEM_ID	WAREHOUSE_ID	EMPLOYEE_ID	DATE_ID	CUSTOMER_ID
101	$100	1	1	1	2	202005	1
102	$200	2	1	2	1	202005	2
103	$200	2	1	1	3	202005	2
104	$400	2	2	1	2	202005	1
105	$800	4	2	2	3	202005	2

Employee (dimension table)

EMPLOYEE_ID	NAME	GENDER	OFFICE	PHONE
1	Joe	M	Texas	•••
2	Jane	F	Utah	•••
3	Jill	F	Texas	•••

Customer (dimension table)

CUSTOMER_ID	NAME	ADDRESS	PHONE
1	Bill	123 Place	•••
2	Ben	456 Street	•••

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DATA WAREHOUSE SIMPLE SCHEMA

I want to report on Orders:

➢ Orders Fact table
➢ Keys to several Dim tables

Star schema

Warehouse (dimension table)

WAREHOUSE_ID	OFFICE NAME	CITY	MANAGER NAME
1	Texas	Houston	John
2	Florida	Orlando	Phil

Orders (fact table)

VALUE DATA			DIMENSION ATTRIBUTE DATA			
ORDER ID	ORDER PROFIT	ORDER QUANTITY	ITEM_ID	WAREHOUSE_ID	EMPLOYEE_ID	DATE_ID	CUSTOMER_ID
101	$100	1	1	1	2	202005	1
102	$200	2	1	2	1	202005	2
103	$200	2	1	1	3	202005	2
104	$400	2	2	1	2	202005	1
105	$800	4	2	2	3	202005	2

Date (dimension table)

DATE_ID	MONTH	YEAR	QUARTER
202005	May	2020	Q2

Orders (fact table)

DIMENSION ATTRIBUTE DATA

ITEM_ID	WAREHOUSE_ID	EMPLOYEE_ID	DATE_ID	CUSTOMER_ID
1	1	2	202005	1
1	2	1	202005	2
1	1	3	202005	2
2	1	2	202005	1
2	2	3	202005	2

Employee (dimension table)

EMPLOYEE_ID	NAME	GENDER	OFFICE	PHONE
1	Joe	M	Texas	•••
2	Jane	F	Utah	•••
3	Jill	F	Texas	•••

Customer (dimension table)

CUSTOMER_ID	NAME	ADDRESS	PHONE
1	Bill	123 Place	•••
2	Ben	456 Street	•••

QUESTIONS?