Florida Overdose Data to Action
PDMP Insight
Business Intelligence (BI) Architecture

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PDMP Insight

Presenters

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E-FORCSE® Electronic-Florida Online Reporting of Controlled Substances Evaluation

PDMP FLORIDA PDMP FOUNDATION, INC.

Supporting the State of Florida Prescription Drug Monitoring Program

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Key Definitions

- Business Intelligence – An umbrella term that includes the applications, infrastructure, tools, and best practices that enable access to and analysis of information to improve and optimize decisions and performance.

- Insight – The capacity to gain an accurate and deep intuitive understanding of a person or thing.

- Data Warehouse – A storage scheme designed to hold data extracted from many source systems. The warehouse then combines that data in an aggregate, summary form suitable for comprehensive data analysis and reporting for predefined business needs

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- A multi-tiered, architectural framework designed to empower PDMPs with the *capability* to implement and sustain a holistic approach to Business Intelligence (BI).

- The capability is implemented based on right-sizing people, processes, and technology to enhance existing analytics maturity and minimize the disruptive impact of organizational change.

- The core component of the data architecture is an elastic, centralized, modern data warehouse (MDW) optimized for data analysis.

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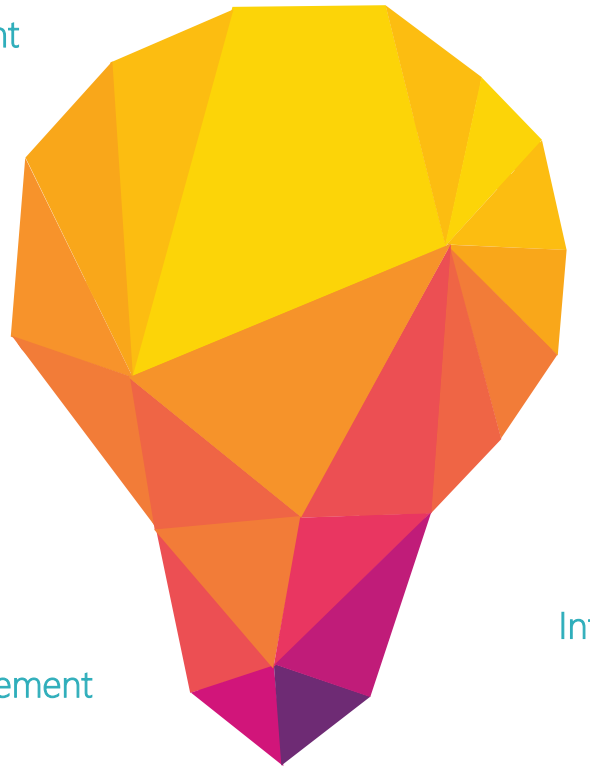
Business Tier



Continuous Improvement

Data Tier

Integrated Governance

Cognitive Tier

Organizational Change Management

Infrastructure Tier

DataDevOps

Client Tier

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Program Tiers

- Business Tier – All organizational program elements required to define, execute, and manage the capability
- Data Tier – Implements primary components of the Data Architecture - including the MDW – executed through a Data Management Framework (DMF)
- Cognitive Tier – Multi-Dimensional Online Analytical Processing (OLAP) and Cognitive Services (Advanced Analytics/AI/ML)
- Infrastructure Tier – Cloud-based services orchestrated for innovation pipelines that are limitless and life-cycle driven
- Client Tier – Consists of tools for developing BI logic, data visualizations, and data analysis
- DataDevOps Tier – DataOps + DevOps = Formal, standardized design/build processes in the development and deployment of BI components
- Organizational Change Management (OCM) Tier – Manages the impact of BI on the organization's information culture
- Integrated Governance Tier – Seamless integration of PDMPI concerns into the existing operational governance model of the PDMP
- Continuous Improvement (CI) Tier – Prioritizes process improvements, maturity growth, and sustainability for the PDMPI capability

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Program Team

- Architects (BI, Data, Data Warehouse)
- Project Managers
- Epidemiologists
- Business Analysts
- Data Scientists
- Subject Matter Experts
- BI Developers

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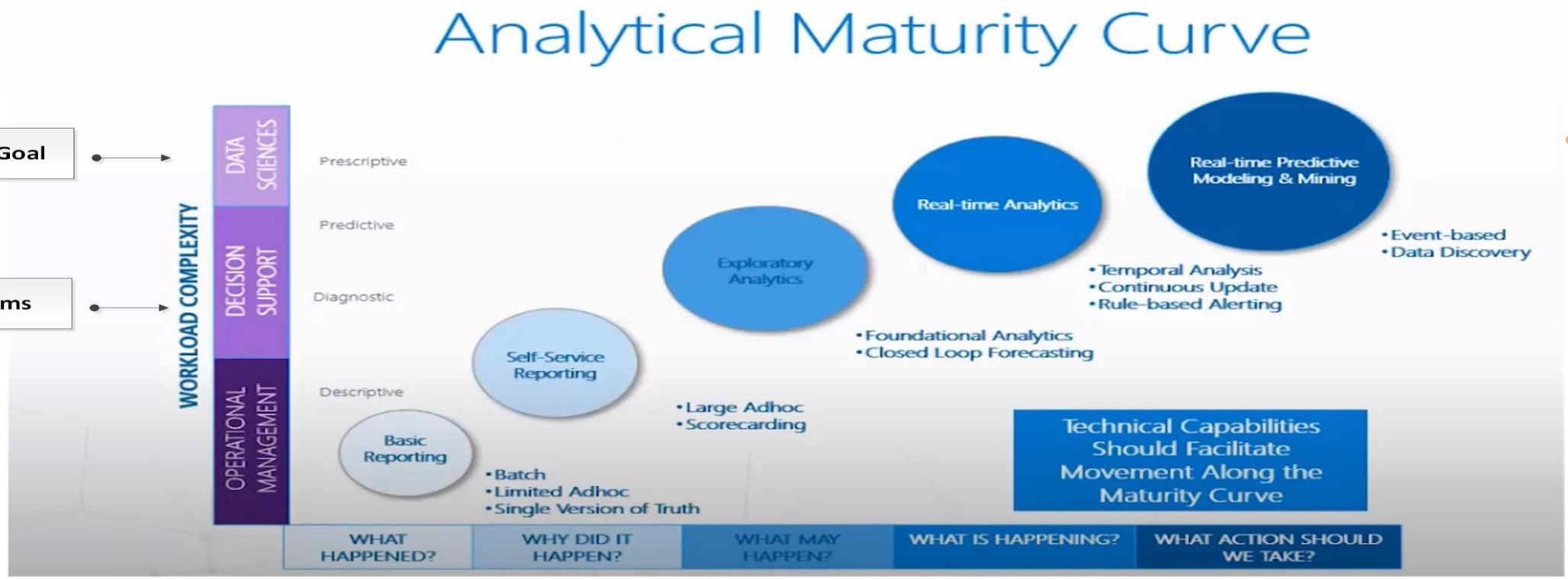
E-FORCSE Insight Analytical Maturity Model (AMM)



Data Sophistication

■ *Raw Data* ■ *Reporting Database* ■ *Data Warehouse* ■ *OLAP Cubes* ■ *Big Data*
■ *Snapshot* ■ *Streaming/Real Time*
■ *Heterogeneous Datasource Linking*

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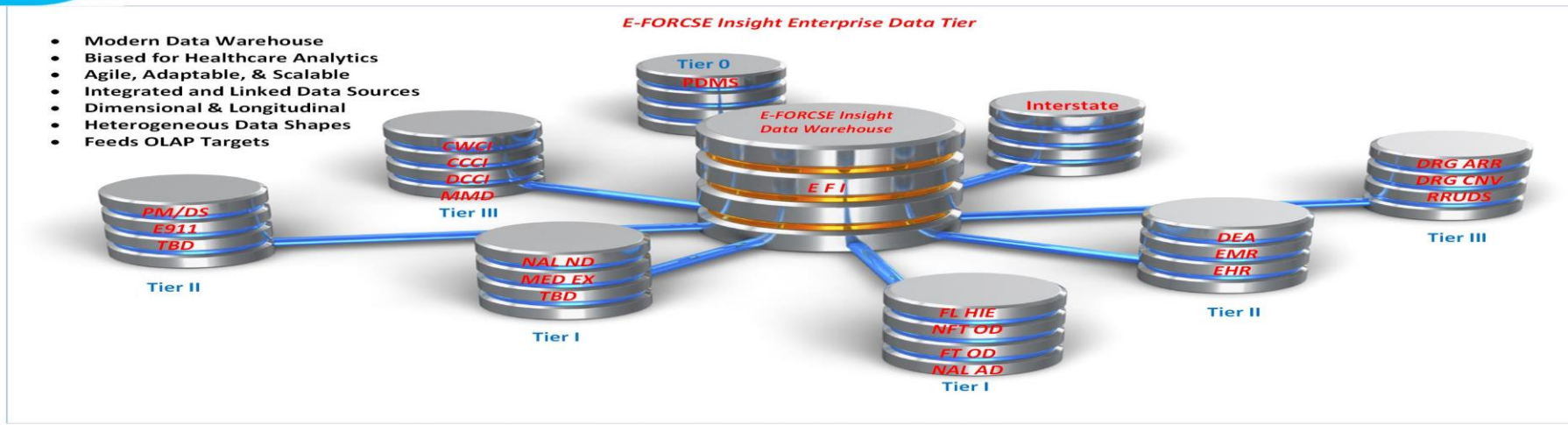

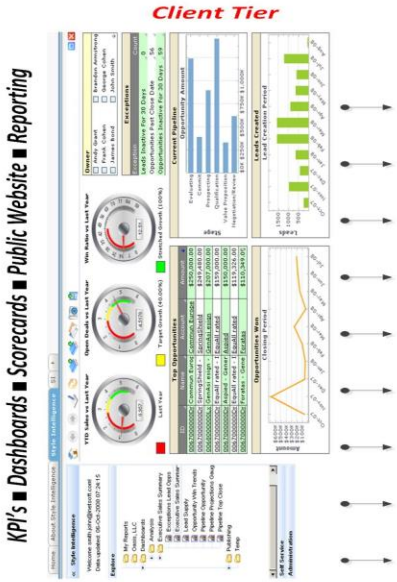

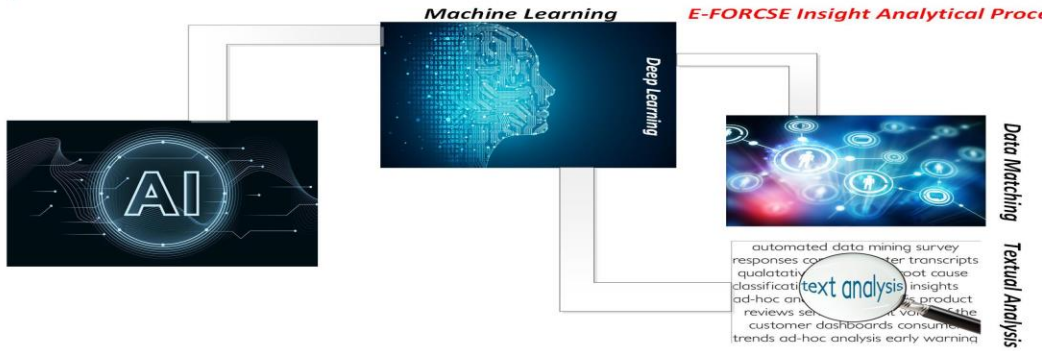

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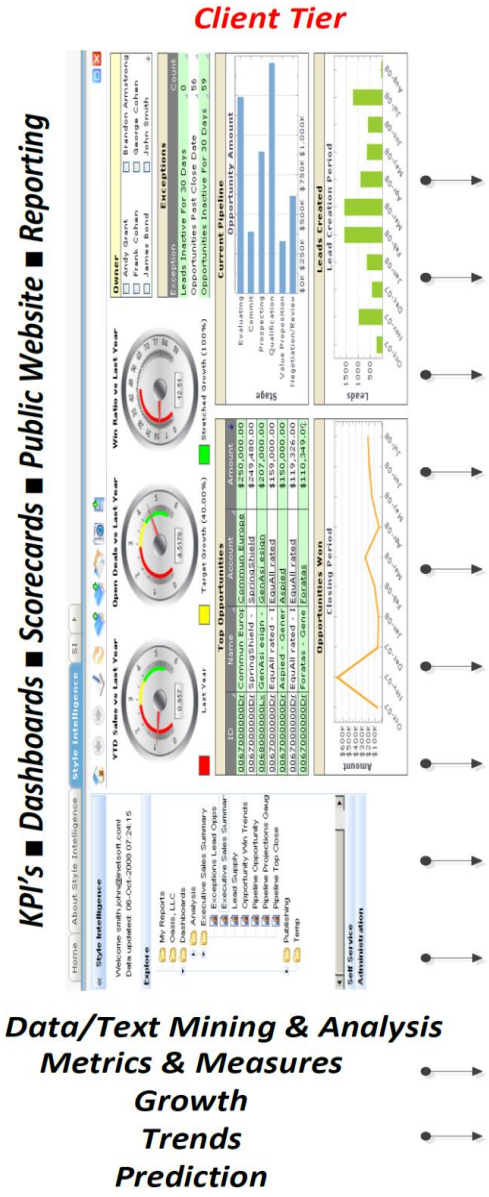
* Client Tier *

- Toolset Agnostic
- Standardization recommended for formal artifact development



Power BI

Excel

tableau

Python

QlikQ

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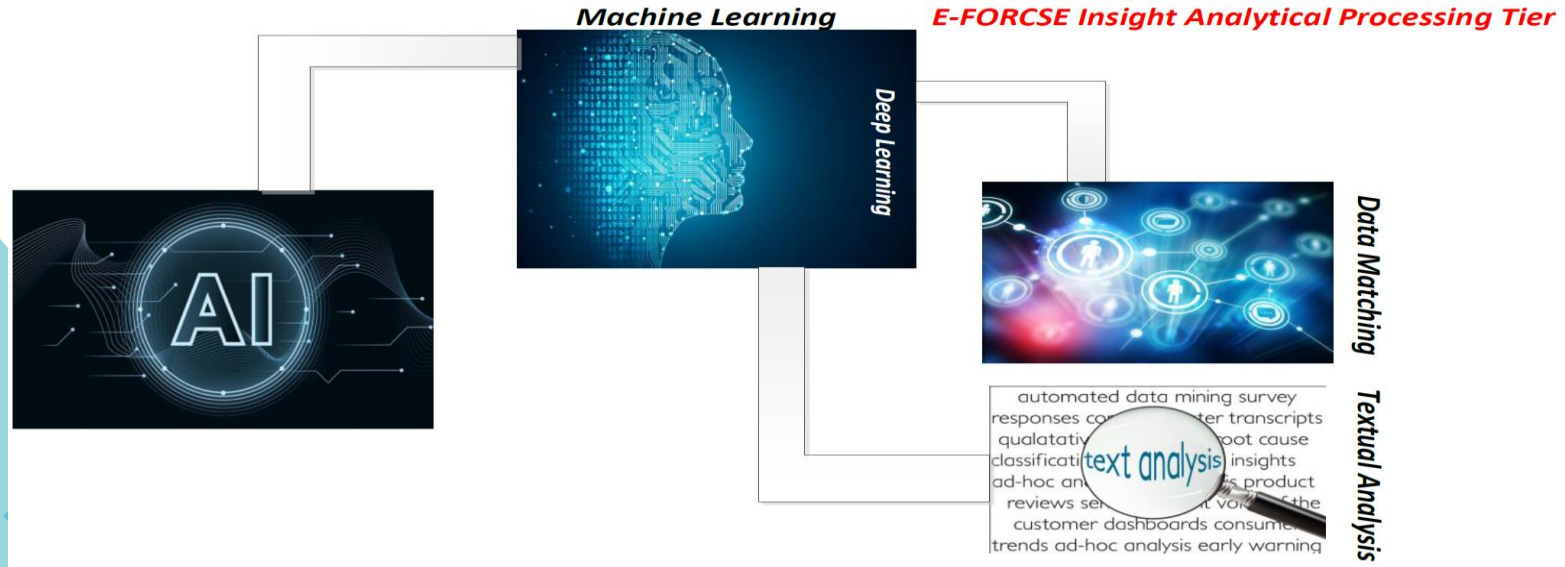
* Analytical Tier *

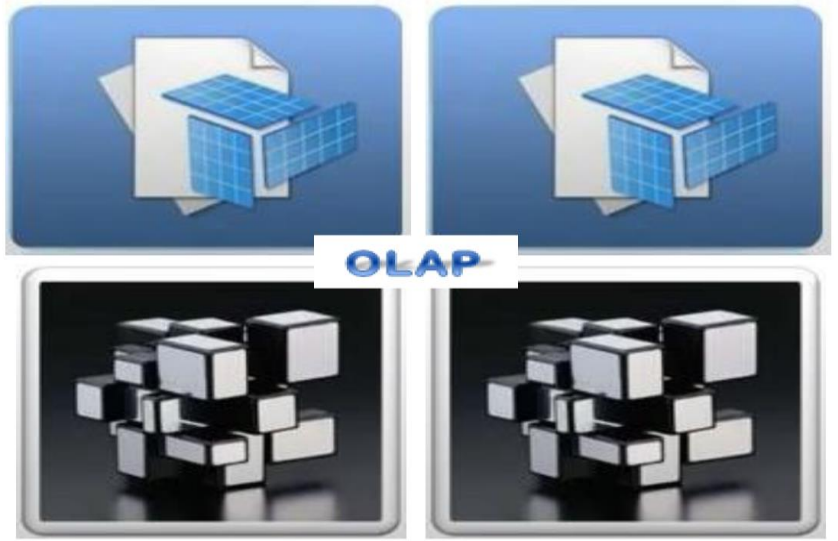
Online Analytical Processing – Data Cubes for simplified rollup based /drill down/drill through analysis

Cognitive Services

- Machine Learning (ML) deep analysis facilitates entity (patient, drug, etc.) data pattern matching and rationalization of unstructured data sources (fatal OD/non-fatal OD information)

- Artificial Intelligence (AI) greatly enhances the prospect of an enterprise predictive model when informed by deep machine learning, data analysis outcomes, data mining results, longitudinal data trends, and supervised engagement.





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* Business Tier *

- Business Case
- Project Management Plan & Schedule
- Business Requirements Management – Functional, Technical With Traceability Matrix (RTM)
- Business Process Management & Analysis
- Agile Business Processes
- Standards Driven (Modeling, DataDevOps)

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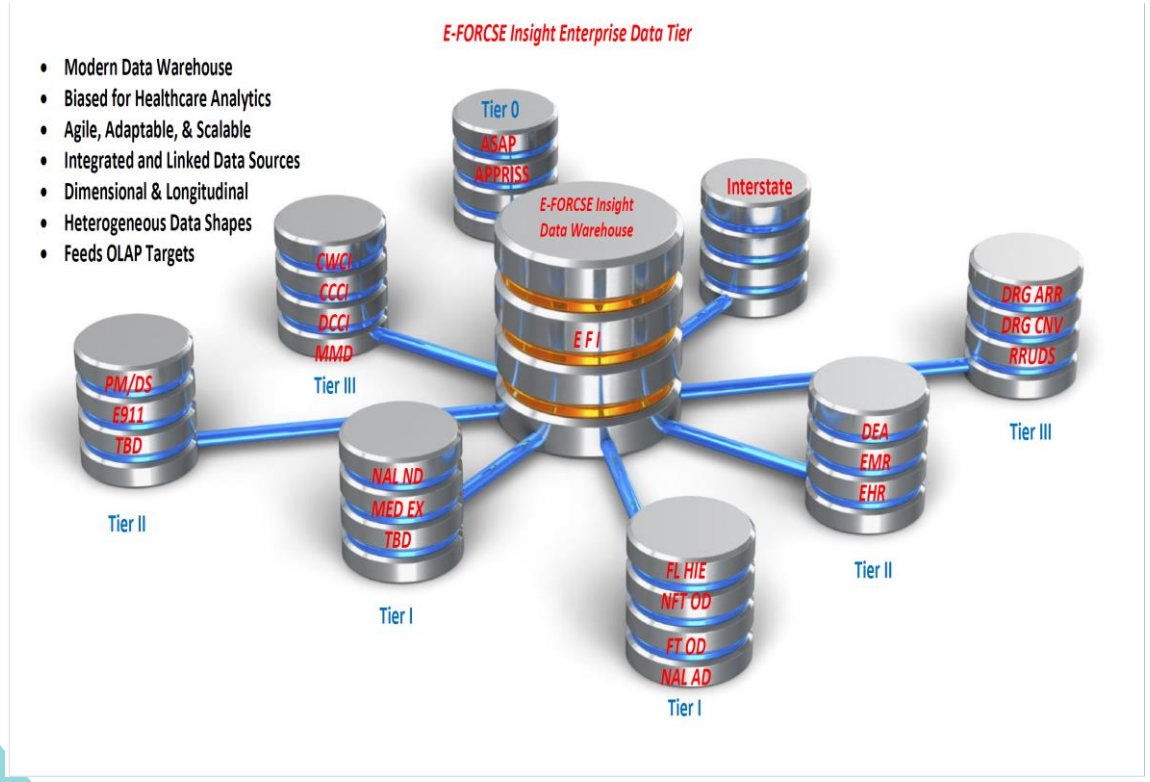
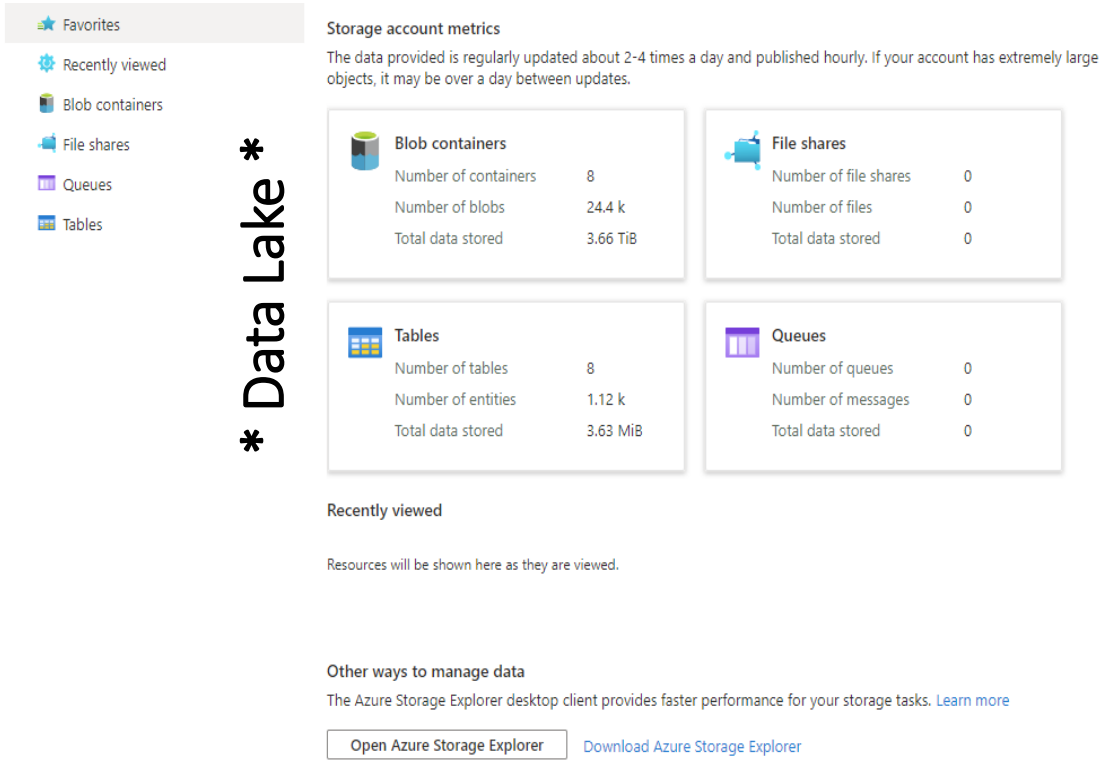
* Data Tier (Florida) *





- Dimensionality – Facts & Conformed Dimensions (unique patient identification regardless of data source)
- Data Integration – Multi-sourced and transitioned between bronze, silver, & golden “states”
- Data Sources – PDMP Vendor; Medicaid Prescriber; CDC; Vital Statistics
- Fully Provisioned: May 2022
- Synchronized: Daily via Differential Datasets (~80K)
- Longitudinal: 2009 ->; 14Yrs ->
- Density: 3.5+ TB

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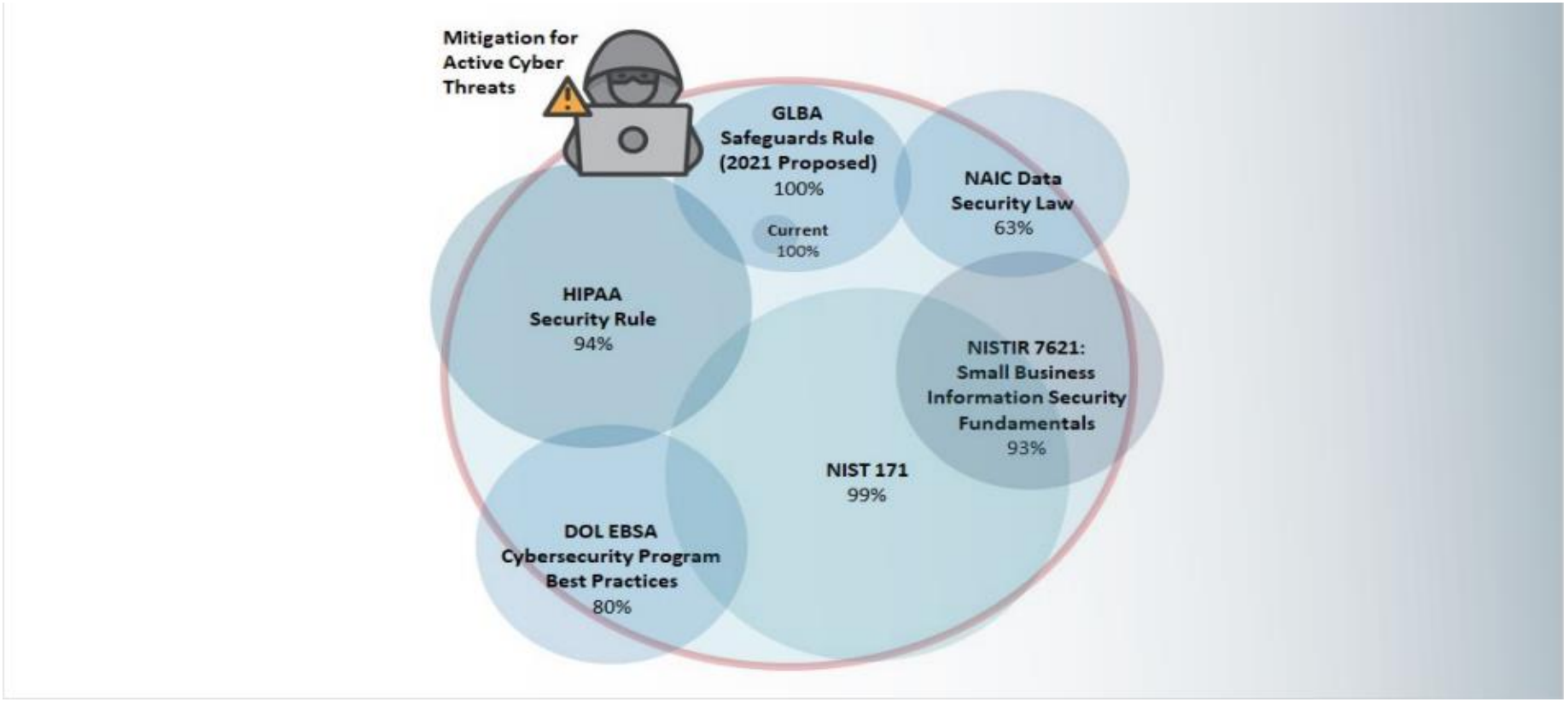
* HITRUST Security *



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* Data Tier * - Data Integration

Tier I

- PDMP Data
  - Dispensations
  - Search/Query
  - User Activity

Tier II

- HIE
- Nonfatal Overdose
- Fatal Overdose
- Naloxone Administration
- Naloxone/Narcan Dispensing
- Medical Examiner Reports
- DEA
- EMR/HER
- E911
- Interstate Information
- Sales

Tier III

- Drug Related Arrests
- Drug Related Convictions
- Child Welfare Case Information
- Drug Court Case Information
- Medical Marijuana Dispensing
- Risk Ratings – Urine Drug Screens

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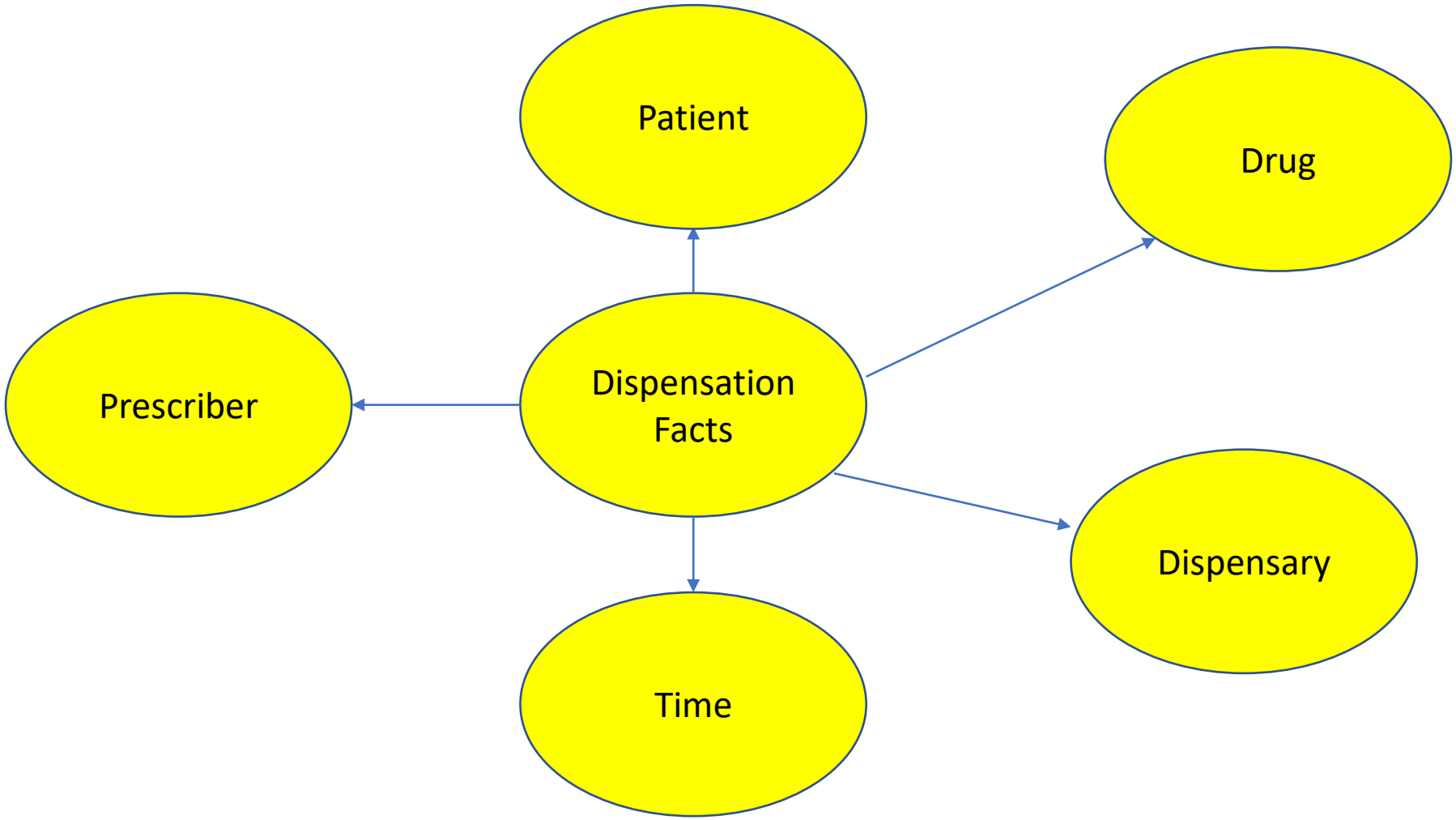
* Data Tier * - Dimensional Data Model (PDMP Data)



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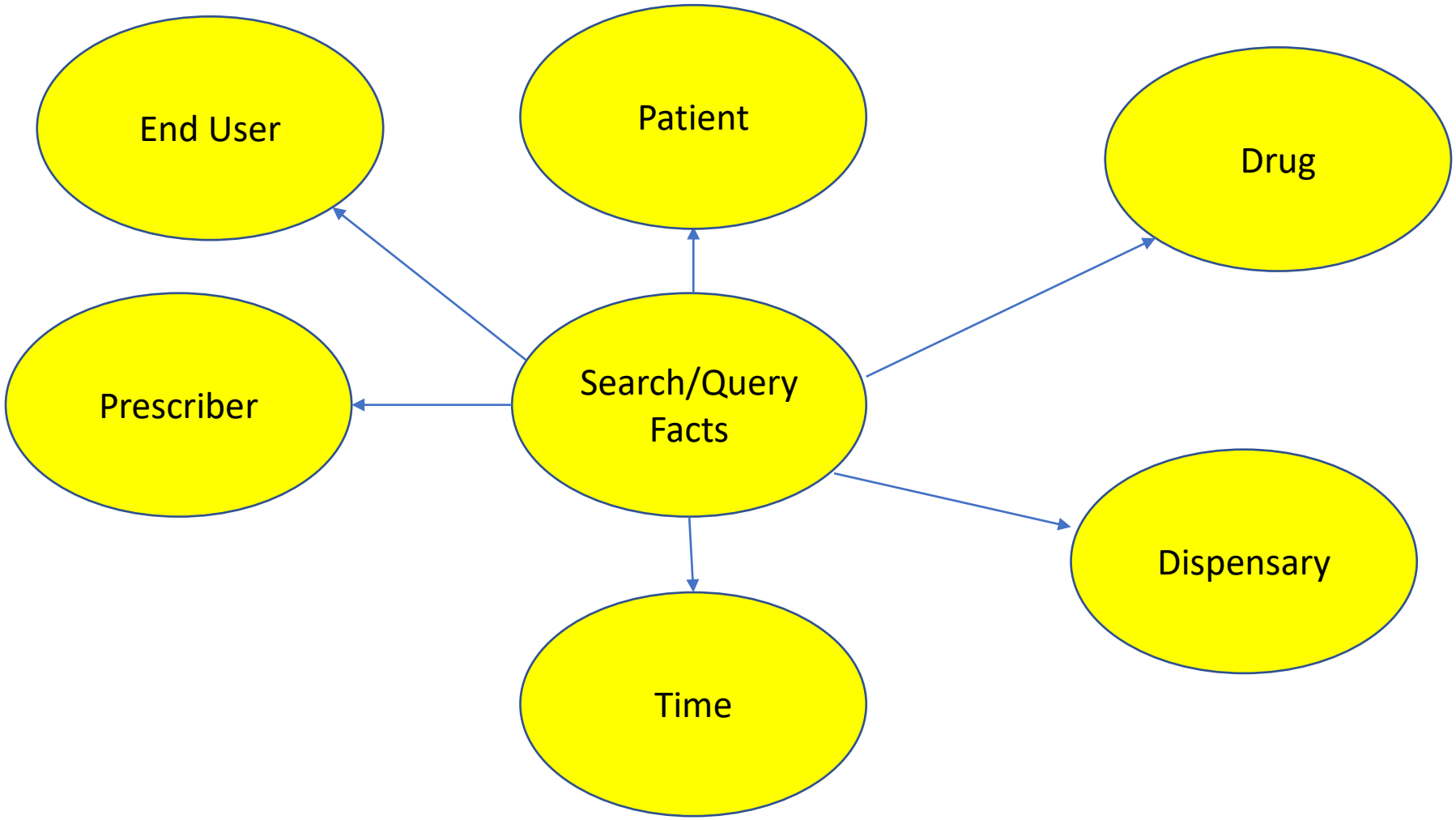
* Data Tier * - Dimensional Data Model (PDMP Data)



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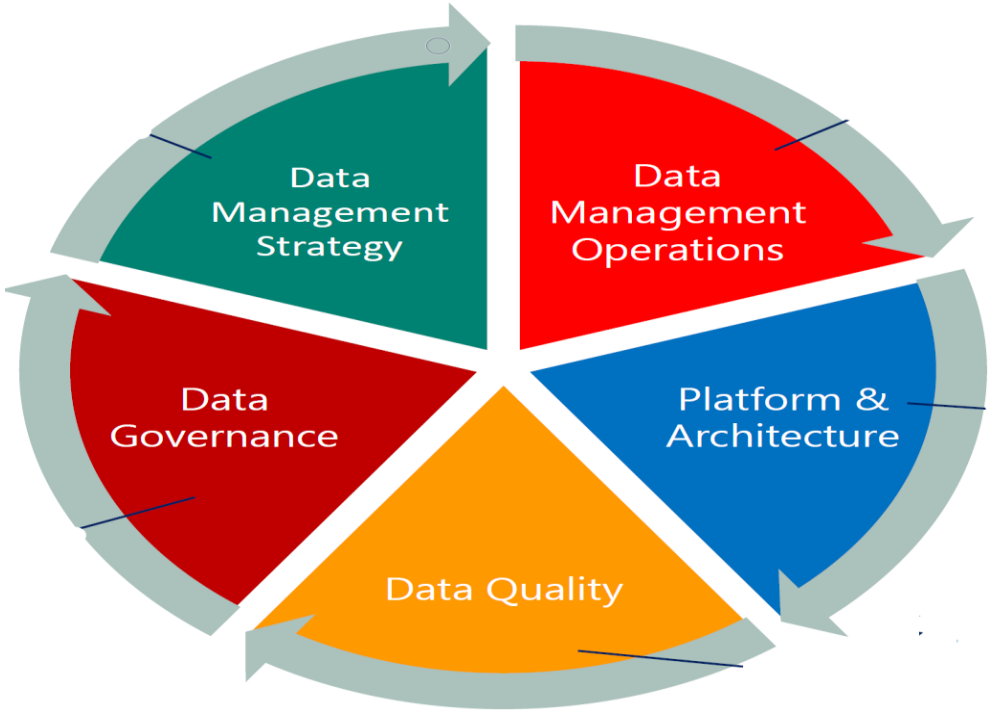
* Data Tier *

Data Management Framework (DMF)



- Data Governance
- Data Quality Assurance
- Data Meaning via Data Dictionary

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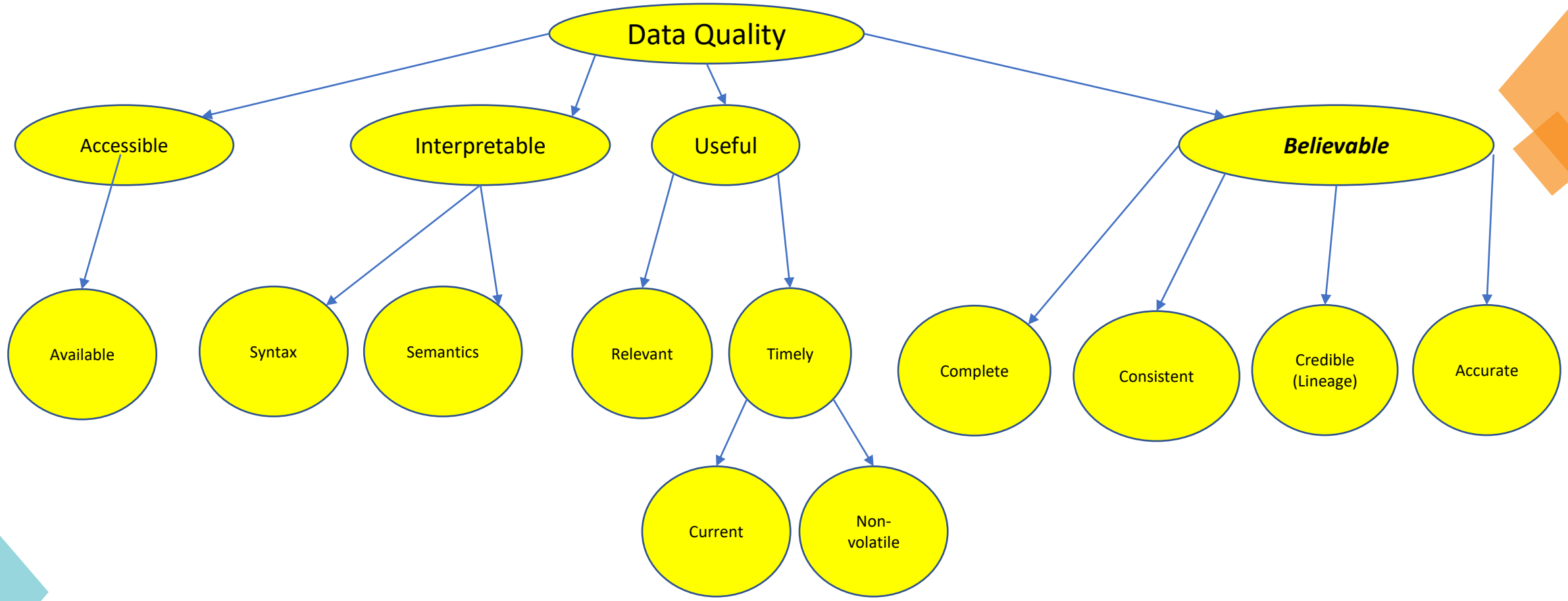
* Data Tier * - Dimensional Data Quality For BI



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* Data Tier * - Data Dictionary Documents and Defines Meaning

Florida Department of Health
Information Data Warehouse Requirements
EFI Unified, Standardized Healthcare Data Elements

Fiscal Year: **2020-21**
Business System Data Source: **ASAP via APPRISS**
Definition Basis: **Native**
Data Element Number: **101005**
Data Element Name: **Date Sold (Situational)**

E-FORCSE® Electronic-Florida Online Reporting of Controlled Substances Evaluation
Florida's Prescription Drug Monitoring Program

Description

This field is used to determine the date the prescription was dispensed (left the pharmacy), not the date it was prepared. This date could be captured from the point-of-sales (POS) system, if the pharmacy has a POS system, and there is a bidirectional flow with the pharmacy management system in order to capture and report this date. Or it could be captured and reported from a will-call management system, integrated with the pharmacy management system.

Code	Definition/Example
N/A	

Length:	8	
Data Type:	Date	
Year Implemented: **Format:**	2019-20 YYYYMMDD	
DW Instantiation Points: **(Schema.Table.Column)** **(Red = Origin)**	asap.DispensingRecord.DateSold dbo.FactDispensing.DateSold	
EFI Notes:	Specify additional subject matter expertise here….	
Extended Reference Data:	{ Links to Full Code Table }	
Sample Query:	select datesold, count(*) as 'Dispensings' from dbo.factdispensing group by datesold order by dispensings desc	
Change Log:	Date	Purpose
	9/1/2019	Data element added

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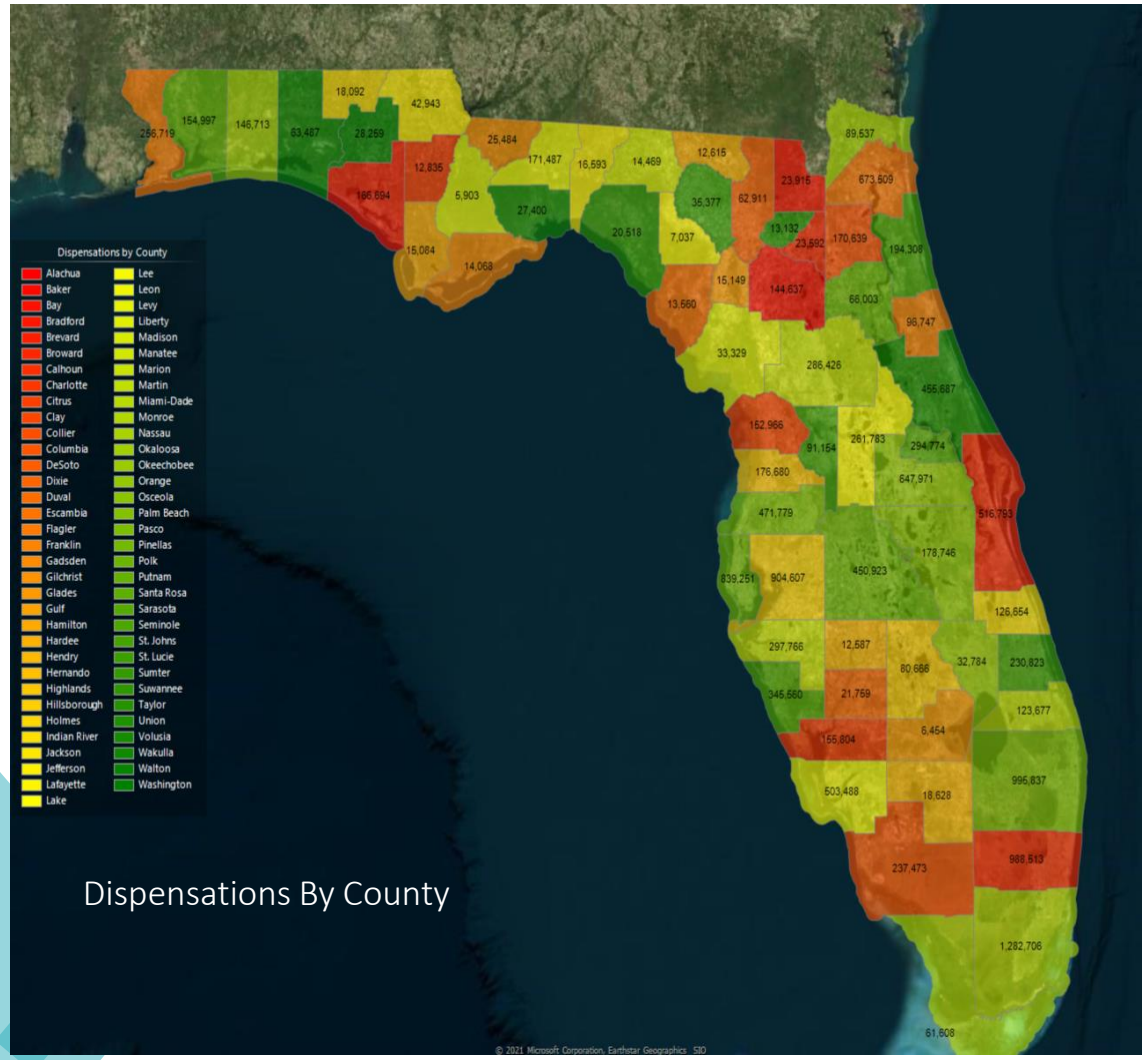
Drill Down Data Visualization Example From E-FORCSE BI



Dispensations By County

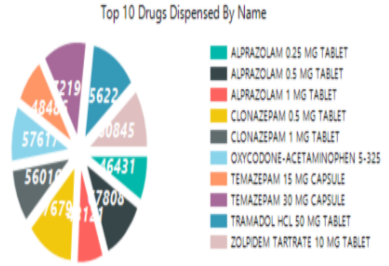
Outcome 2: Reduction of the quantity of pharmaceutical controlled substances obtained by individuals

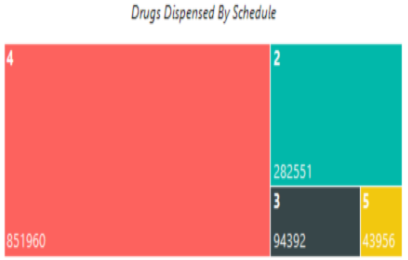
Performance Measure: Characteristics of controlled substances reported to the PDMS.

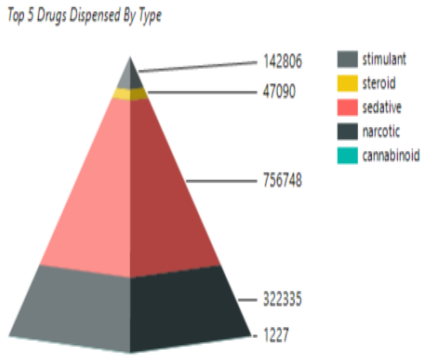
** Miami-Dade County **

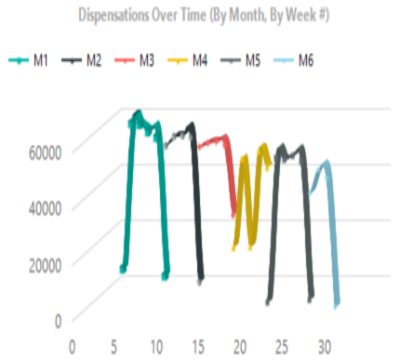
Data Characteristics	RY21	RY20-21 Change (%)
Prescription (Rx)	1,271,825	
Days Supply	33,532,102	
Patient	355,998	
Pharmacy	1,663	
Prescriber	20,814	
Population 18 years and over	2,188,432	

Table 2. Characteristics of schedule II through schedule V prescriptions dispensed to Florida residents 18 years of age and older.









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