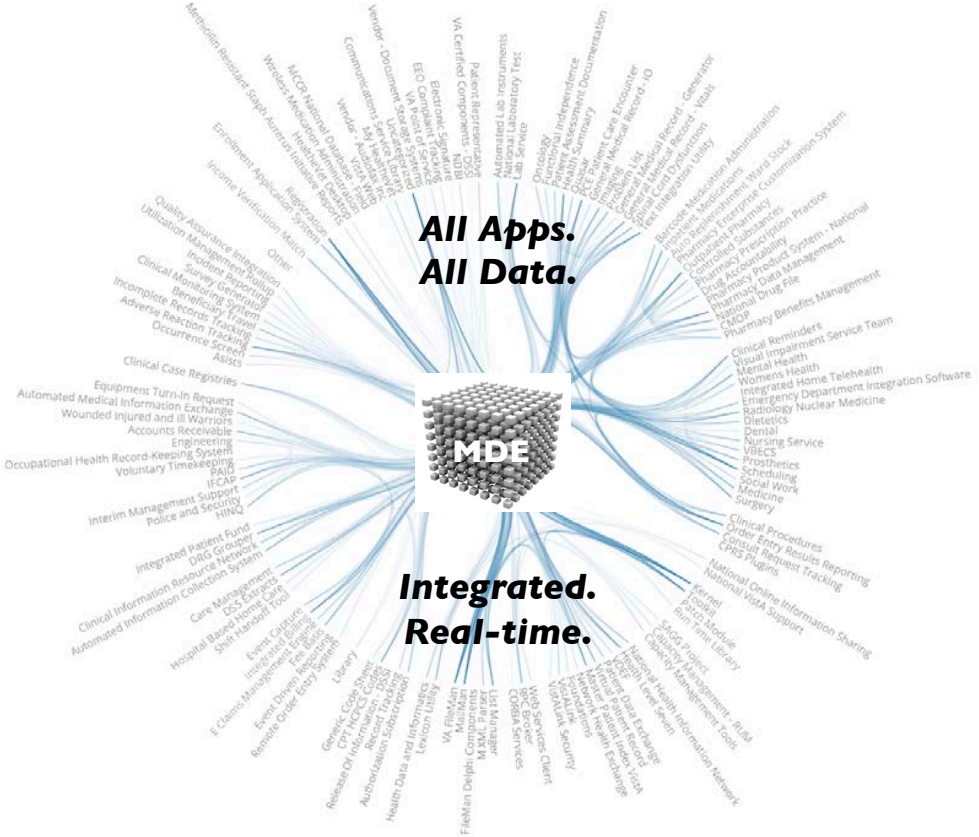
VISTA Data Model (VDM)

A Path to VISTA Data Management:

- VISTA's Database
- VISTA's Data Model
- VISTA's Data Model Exposed
- Benefits of Leveraging VISTA's Data Model:
  - Master Metadata Management
  - Centralized Knowledge Management
  - Master Data Definition
  - Patient-Centric Security Model
  - Separating Business logic from Data
  - Query Access

Review: VISTA's Database

The foundation of VISTA is a high performance Multidimensional Data-integrated Application Engine in which all data and all applications are fully integrated in real-time with each other and to one single authoritative data source.



VISTA's integrated application data engine. *All 160+ applications are integrated with their data and logic inside the multidimensional data engine (MDE). This keeps transactional patient data and logic highly integrated for real-time use within one single data store.*

VA uses the same healthcare industry-standard data engine that nearly 50% of hospitals in the US currently use as their core EHR database.

This same multidimensional data engine is also used as the real-time transaction engine of the world's five largest banks, the largest Wall Street trading systems, and over half a million ATMs in North America.

Approach: ***Linked VISTA***

Exposing VistA's Data Model securely as a Web-standard model enables web-scale integration.

Web-standard Integration requires:

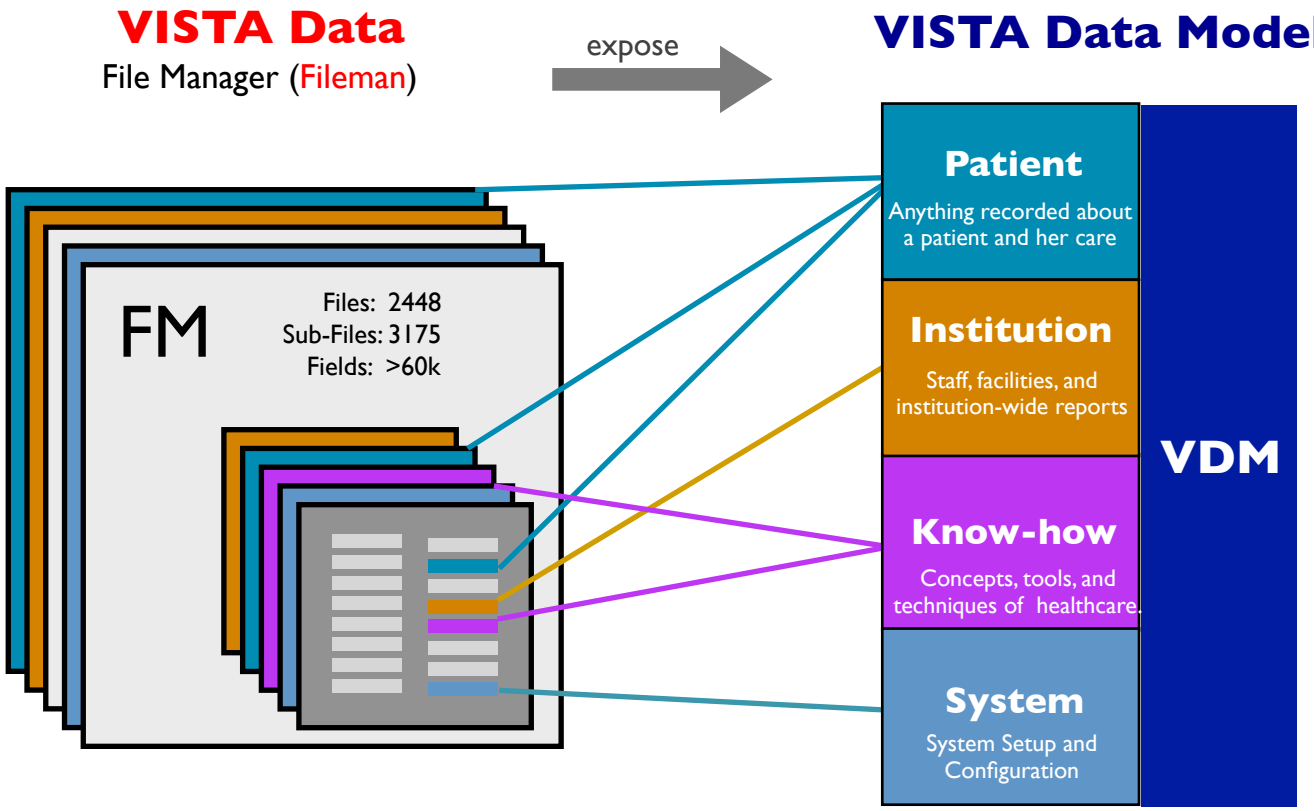
Common Data Model.
Data Security.
Data Services.

A model-centric approach to VISTA data modernization would provide comprehensive granular, metadata driven access and security to all data.

This would allow publishing, linking, and exchanging, with patient-centric security, granular data with internal and external systems with international Web standards.

VDM: Expose and Leverage the Model

The first stage of data modernization is to expose and leverage VISTA's real, live operational data model. Since this is just metadata, there is no patient data involved. Unlike many NoSQL databases which are schema-less, VISTA's NoSQL database model is self-documenting through Fileman. This allows us to render this in a standard definition format. In this new web-standard medium, data can be sorted, tagged, searched, and organized by data categories such as by patient, institution, know-how, or system information.



Access: Thousands of RPCs, API's, HL7
Model: Unknown

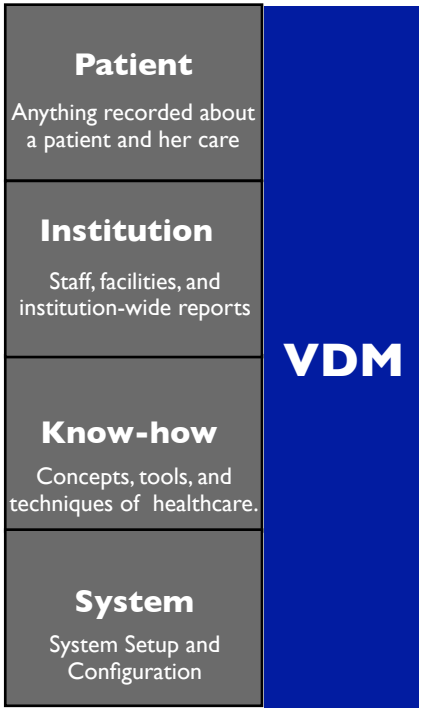
Access: Single query access
Model: Consistent, Transparent

VDM: Master Data Management

A benefit of a VISTA data model allows one to manage data logically across all VISTA application boundaries independent of the source of the data. This lets one manage data with much flexibility, including logically partitioning and managing the data using metadata tagged categories (such as Patient, Institution, Know-how, and Systems information).

- ***One may logically partition data by any class of data***, such as Patient data, Institution data, re-usable Know-how, and System configuration data.
- ***One may extract and move <u>all</u> patient data from system to system with one operation***, making system configuration migration and patient record movement far more efficient.
- ***One may apply security metadata or protocols to any of these logical classes*** of data. For example a patient-centric security model for patient data, and thus enforce patient-centric controls on information exchanged.

VISTA Data Model



Benefits:

Patient Data Management
Extract and manage patient data with patient-specific security and metadata, allowing patient-centric controls on data access and exchange.

Institutional Data Management:
Institution specific data can be exchangeable and centrally manageable

Knowledge Management:
Common medical concepts, standards, and know-how may be identified and managed as a clearly defined class of VISTA data.

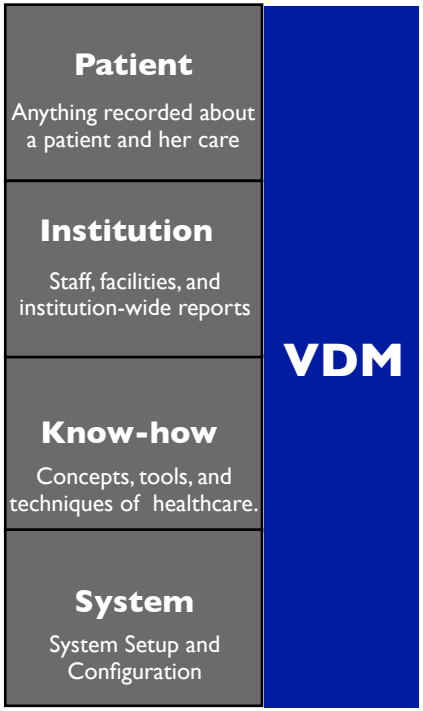
System Management:
The entire configuration of a system can be identified, extracted, and transported, and inserted from system to system

VDM: Patient-Centric Data Security

An exposed VISTA data model allows one to tag and partition certain classes of data separately from all other data in VistA. Specifically, this allows one to granularly partition any and all Patient data from all other kinds of data in VistA. This provides true, direct, "on the metal" security on patient data itself.

VISTA Data Model

- *The most important class of data to apply security is the Patient data category. This will allow very granular patient-centric security on the data itself.*
- *Current VISTA security is based on actions one can take using a legacy menu system - which has no relationship to the data.*
- *With a data-centric security model, we can specify not just what type of data ("Mental Health Record"…) but whose data ("For patient X").*
- *This is much more specific and secure than the prior VistA security model.*



Patient-centric security model

Extract and manage patient data with patient-specific security and metadata, allowing patient-centric controls on data access and exchange.

This is compatible with security notions in Meaningful use Data Exchange: it can suppress even data that exists if there is no access permission.

It is essential to improve precision in data security to permit access to VISTA data securely. Otherwise one will have to reverse-engineer 3300 legacy RPCs and their one-off use of Kernel's menu options for each payload.

A patient-centric security model is much more appropriate, flexible, and secure as a foundation for patient data security than the current VistA security model. The current VistA security model provides security only indirectly, through legacy controls of a menu system for a legacy roll and scroll terminal interface – which has nothing to do with the type of data at all (!).

VDM: Analytics Driving Interoperability

Comprehensive exposure and analytics of the VISTA Data Model will drive enhanced data use and interoperability as well as a major improvement in the structure of the database itself. To address these and other areas, focused reports could be generated from the model including:

Report	Activity	
Inconsistencies between VistA data models	Drive dictionary and code fixes in various centers so that every center is running the same consistent model	→ **Enterprise Data Model**
Isolate centrally and locally managed "know-how"	Enables the next generation of enterprise knowledge services that seamlessly synchronize VistAs and other applications	→ Centralized Knowledge Management
Under-definition in the model	Too many ill-defined string values and not enough nuance ("zip code", "telephone number") can be defined, and provided additional metadata ("home", "work", "mobile") leading to a plan for incremental dictionary improvement	→ **Enterprise Data Definition**
Key logic performed within FileMan	The barrier between the data store and business logic will be laid bare. This report will encourage the movement of certain types of logic into FileMan and out of less maintainable procedural code.	→ Clean separation of business logic from data
Overlooked but highly valuable types of patient data (Some of this may have been hard-set by the application logic, and overlooked by Fileman or DD)	Improve VistA Data mining (for CDW etc.) and interoperability (more comprehensive electronic patient records). Without a complete model, how do you know what you're leaving behind?	→ Clinical Research → **Interoperability**
VistA model/ FHIR comparison (key types)	Show how a direct from VistA transformation can remove the need for redundant intermediate, hard to maintain procedural code	→ Accelerate Data Exchange
Isolate patient from other types of data	Enable patient-data access control rather than the crude option/API security now in VistA	→ **Patient-centric Security Model**