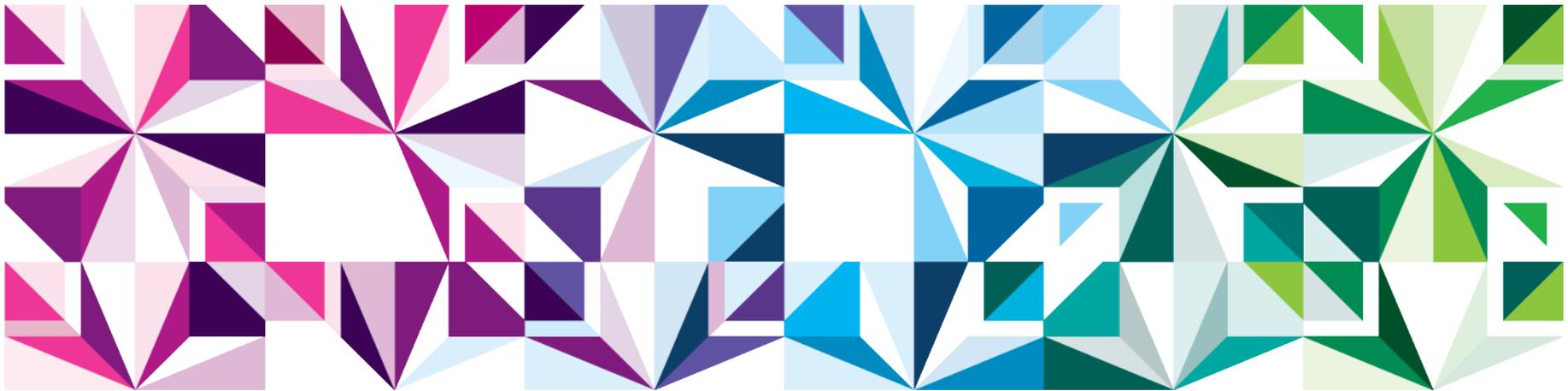


# From Data Warehouse Models to Analytical Reports

**Mladen Jovanovski**  
Client Technical Professional  
Information Management Software  
IBM Software Group  
[mladen.jovanovski@rs.ibm.com](mailto:mladen.jovanovski@rs.ibm.com)

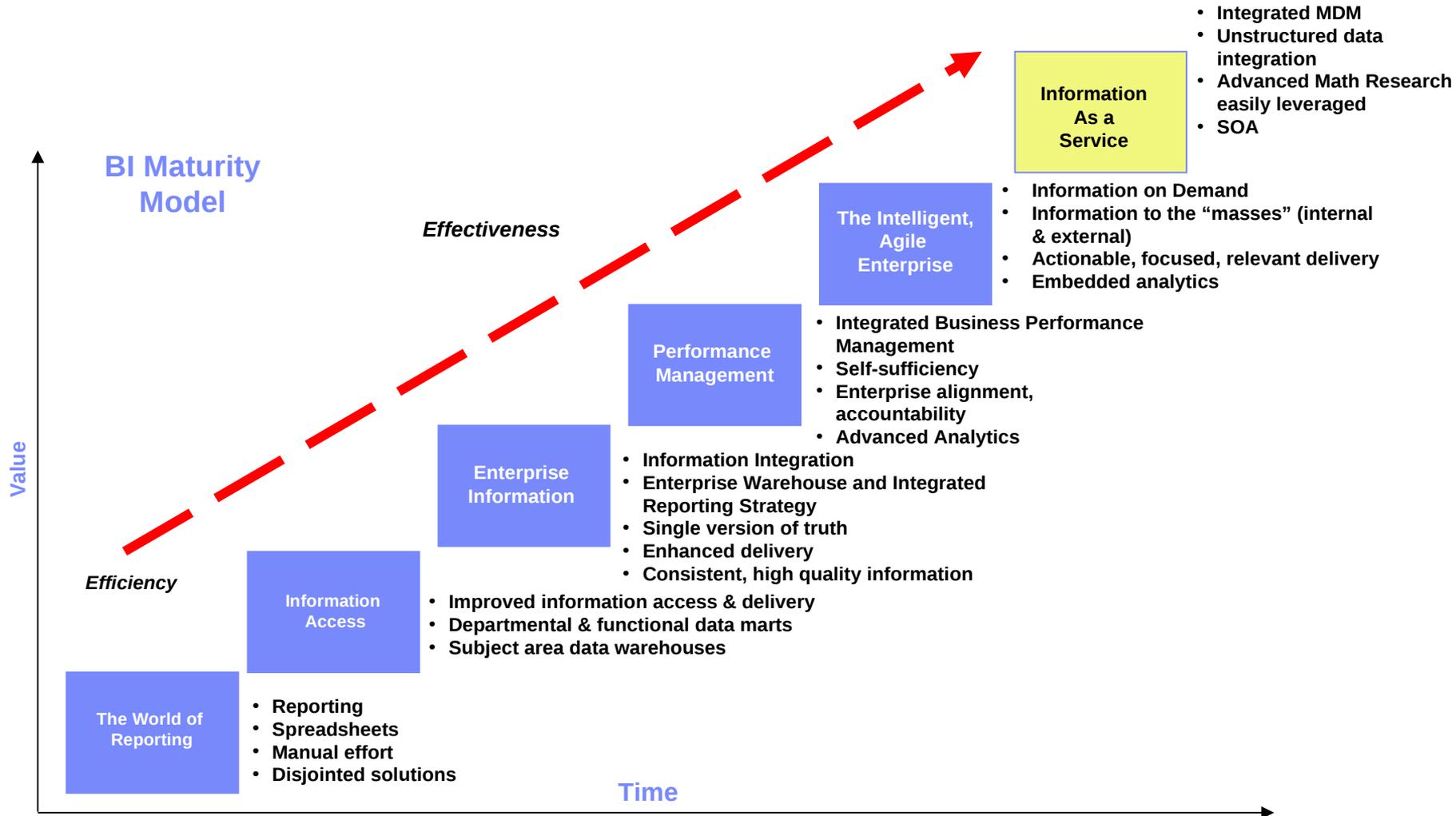


# Agenda

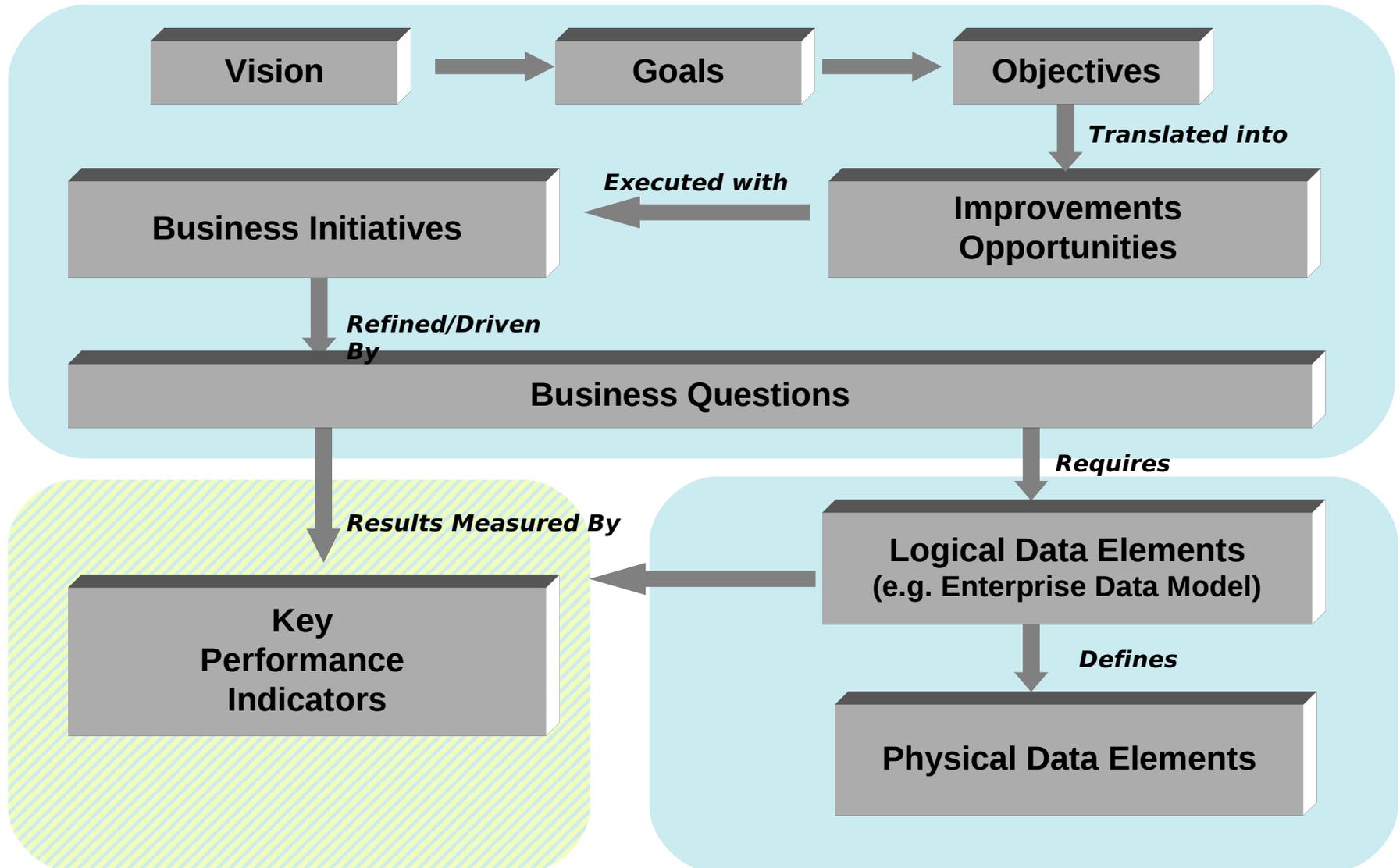
- Introduction to Data Warehouse Architecture
- IBM Industry Models
- IBM Data Warehouse and Business Analytics software portfolio
- 5 steps to build a Cognos Report from an Industry Model
- Use Case: Telekom Srbije

# Introduction to Data Warehouse Architecture

# BI Maturity Model



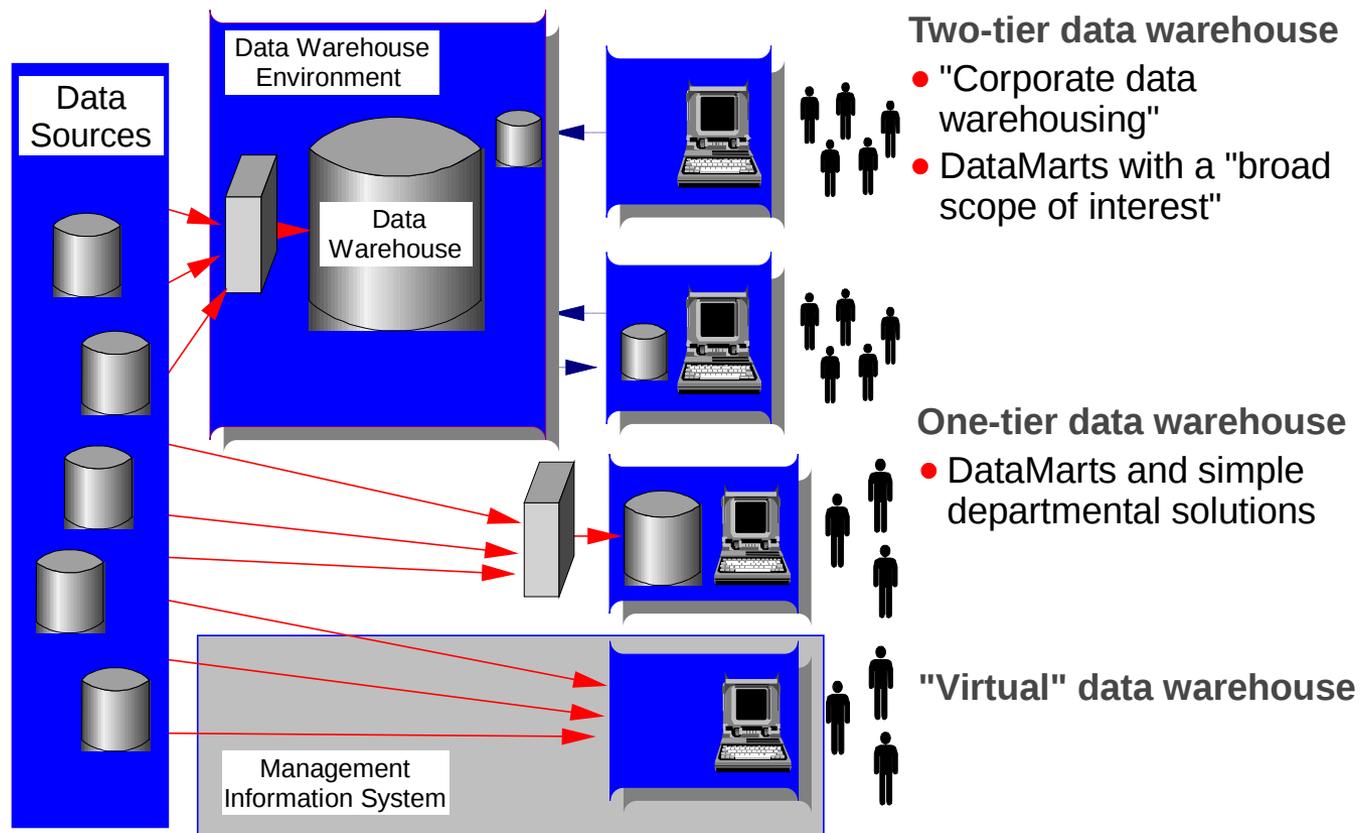
# Aligning DW and BI to strategic business goals



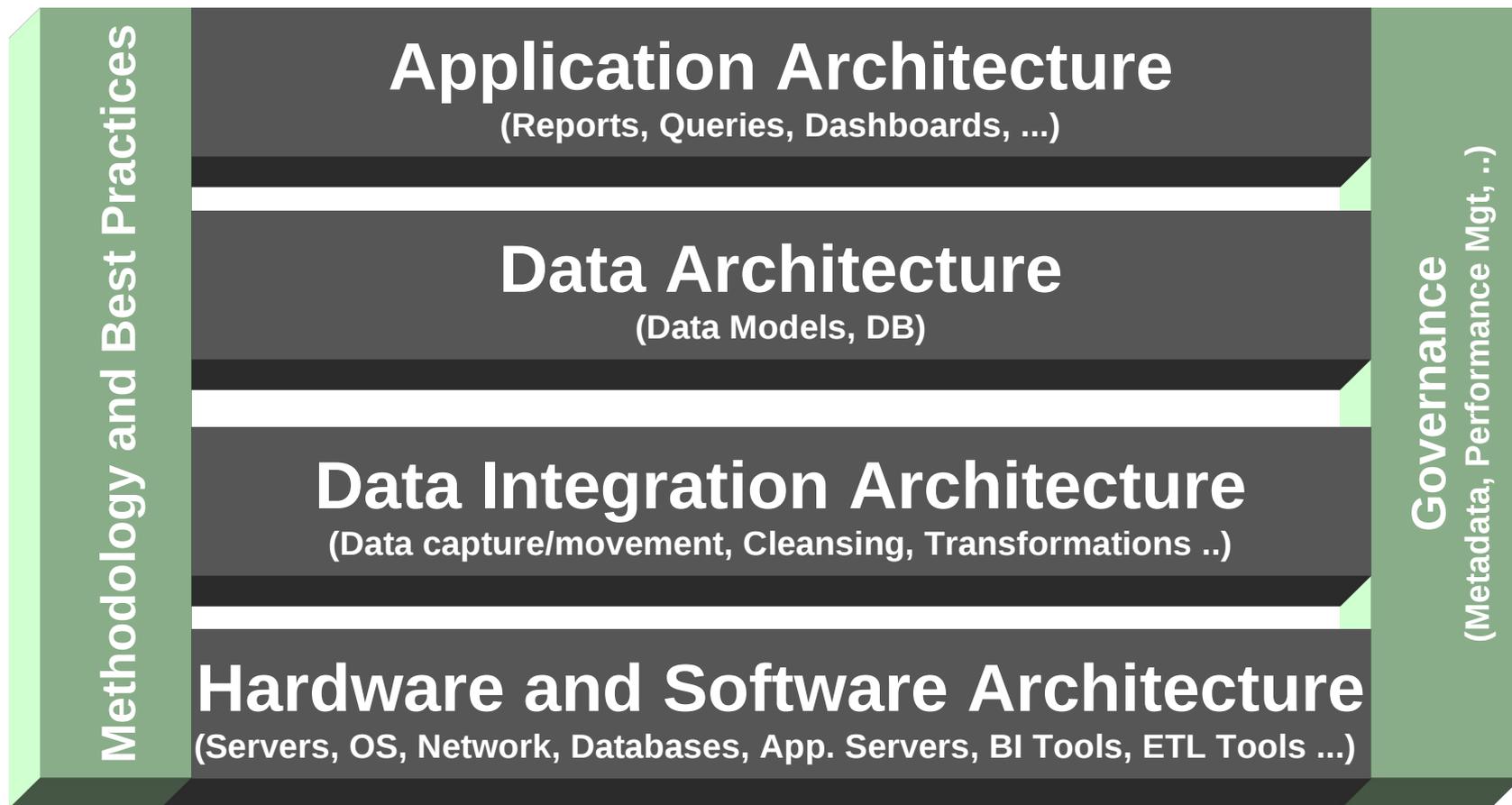
# Key Industry Initiatives to Leverage the DW

<p><b>Banking</b></p> <ul style="list-style-type: none"> <li>▪ Profitability</li> <li>▪ Relationship marketing</li> <li>▪ Risk management</li> <li>▪ Asset and liability management</li> <li>▪ Compliance</li> </ul>	<p><b>Financial Markets</b></p> <ul style="list-style-type: none"> <li>▪ Risk management</li> <li>▪ Asset and liability management</li> <li>▪ Compliance</li> </ul>	<p><b>Health Plan</b></p> <ul style="list-style-type: none"> <li>▪ Claims analysis</li> <li>▪ Medical management</li> <li>▪ Provider and network</li> <li>▪ Sales, marketing &amp; membership</li> <li>▪ Financials</li> <li>▪ Disease Management</li> </ul>
<p><b>Insurance</b></p> <ul style="list-style-type: none"> <li>▪ Customer centricity</li> <li>▪ Claims analysis</li> <li>▪ Intermediary performance</li> <li>▪ Compliance</li> <li>▪ Risk management</li> </ul>	<p><b>Retail</b></p> <ul style="list-style-type: none"> <li>▪ Customer centricity</li> <li>▪ Merchandising management</li> <li>▪ Store operations and product management</li> <li>▪ Supply chain management</li> <li>▪ Compliance</li> <li>▪ Inventory management</li> </ul>	<p>▪ Compliance</p> <p><b>Telco</b></p> <ul style="list-style-type: none"> <li>▪ Churn management</li> <li>▪ Relationship management and segmentation</li> <li>▪ Sales and marketing</li> <li>▪ Service quality and product lifecycle</li> <li>▪ Usage profile</li> </ul>

# DW - Possible Approaches



# Main Components of a DW Solution



# The Data Warehousing: Design Considerations

- Start with the right skills and organization in place
  - DW requires discipline to implement
- Plan for consolidation view of the data (aka “Single source of truth”)
- Structured and unstructured data
  - Should enable to search all data
  - Uncover all insights about customers, products, organization, etc
- Plan the solution to deliver real time information
  - At least have it as a roadmap when architecting the solution
  - In the future you might need to be more dynamic to support business decisions
- Predictive analytical capability
  - Proactive and smarter decisions
- Re-use of assets (data, process, etc) as a standard

# The Data Warehouse: Design Considerations

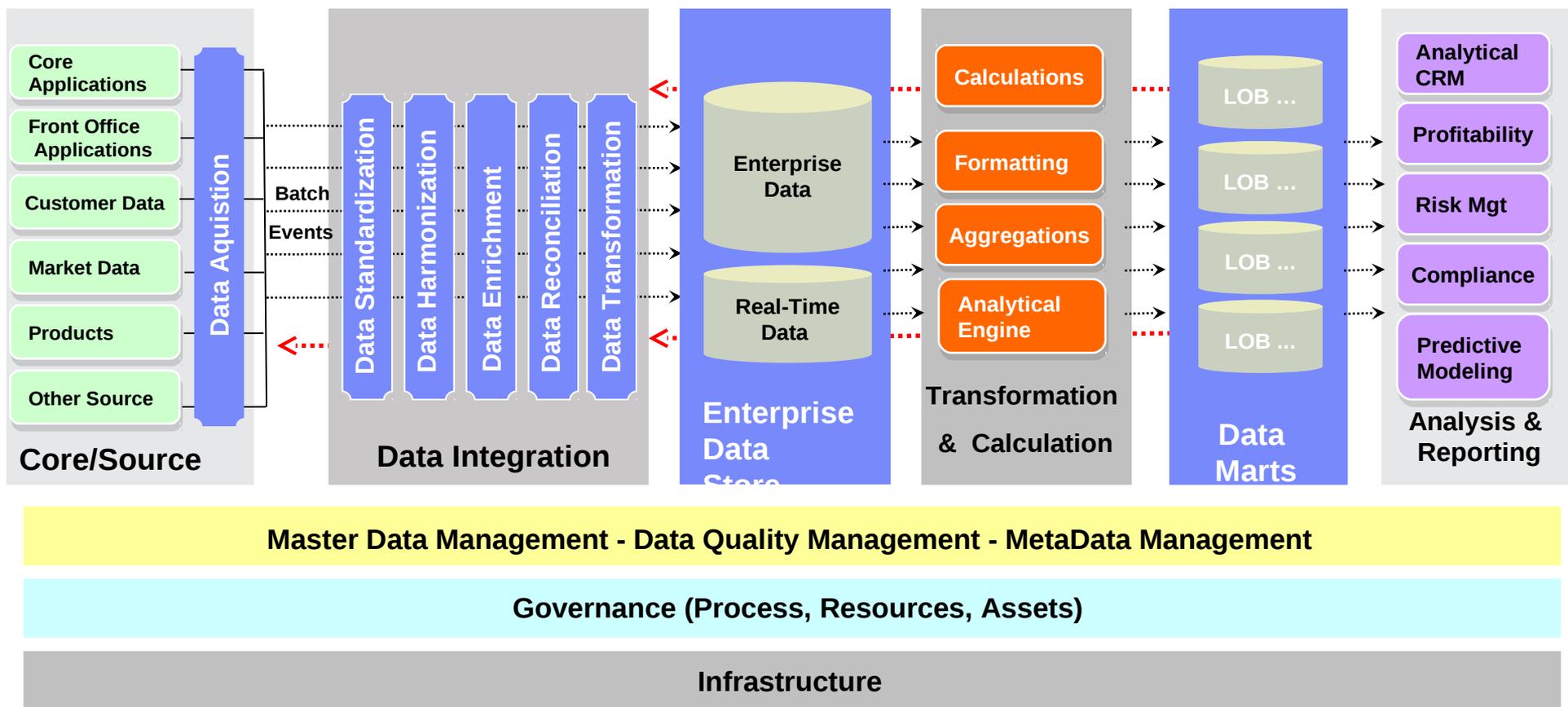
- Seamless Scalability
  - Linear scalability
  - Allow growth at the right time with minimum impacts and interruptions
- Modular growth with predictable cost
  - Predictable costs based on business growth
  - Predictable performance for a predictable cost
- Choose an solution that provides low adoption risk
  - Proven solution
- Reliability and integrity
  - Ensure business continuity
  - Support mission critical applications
  - Information integrity

# The Data Warehouse: Design Considerations

- Governance
  - Resources consumption and utilization
  - Performance management
  - Workload Management
    - Guaranty SLAs and availability of resources due too business priorities
  - Traceability (data, process)
- Regulatory compliance
  - Comply with current government and industry regulations and standards, especially regarding the integrity and availability of information
- Security, privacy and data protection
  - Ensure the security and privacy of data, information, systems and people with the right policies, methods, tools and overall governance

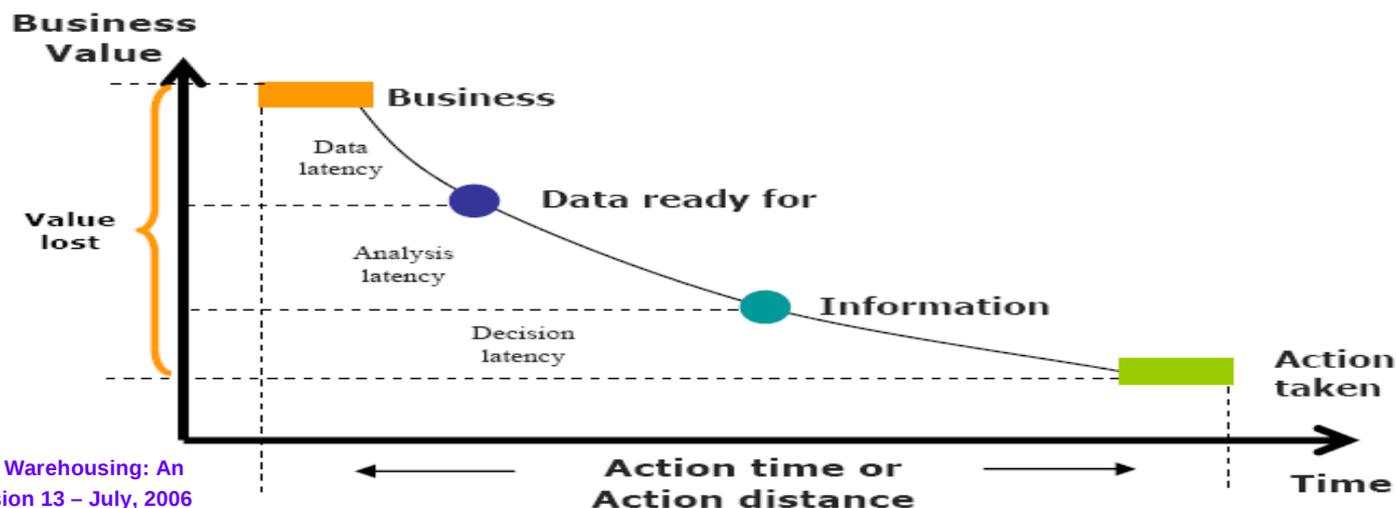
# Data Integration Architecture

Data-Driven Reference Architecture



# Data Integration and Data Latency

- Data Latency: One of the most important drivers that affect design of the entire DW
- According to Dick Hackathorn, data latency has three components
  - Data preparation latency: The time it takes to get the data ready for analysis
  - Analysis latency: The time it takes to get the results of an analytic operation
  - decision latency: The time it takes for the person receiving the results to understand what action must be taken.

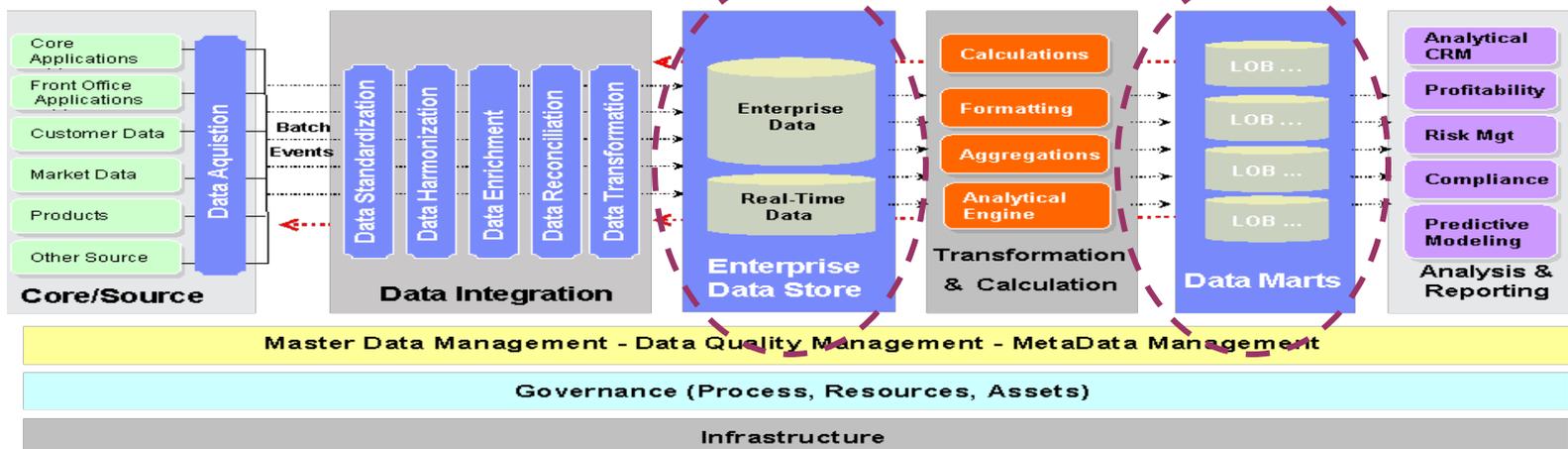


\* Current Practices in Active Data Warehousing: An Update - Richard Hackathorn - Version 13 - July, 2006

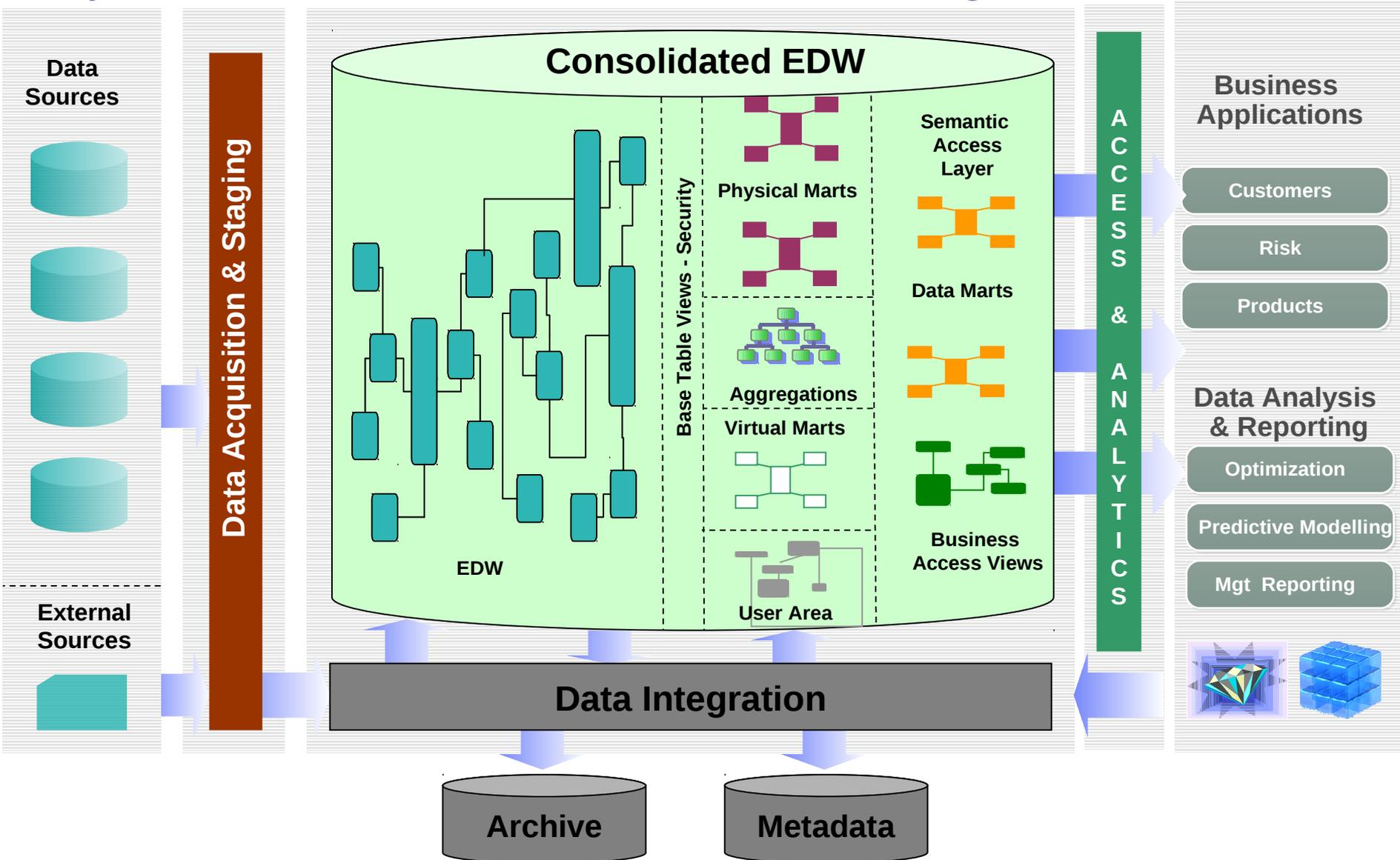
# Data Architecture Design Considerations

- Includes Enterprise Data Warehouse and Data Marts
- Needs to promote a consolidated view of the business - Avoid data redundancy
  - Consolidation of all business process - “Single version of the truth” - “*Golden Copy of Data*”
  - Guarantee single source of information to be used in the decision process by different LOBs
- Optimization Layers
  - Allow optimization to support specific business need
- Data Synchronization
  - Allow batch and real-time updates of data structures
  - Allow concurrency of process (read and write due to continuous data ingestion)

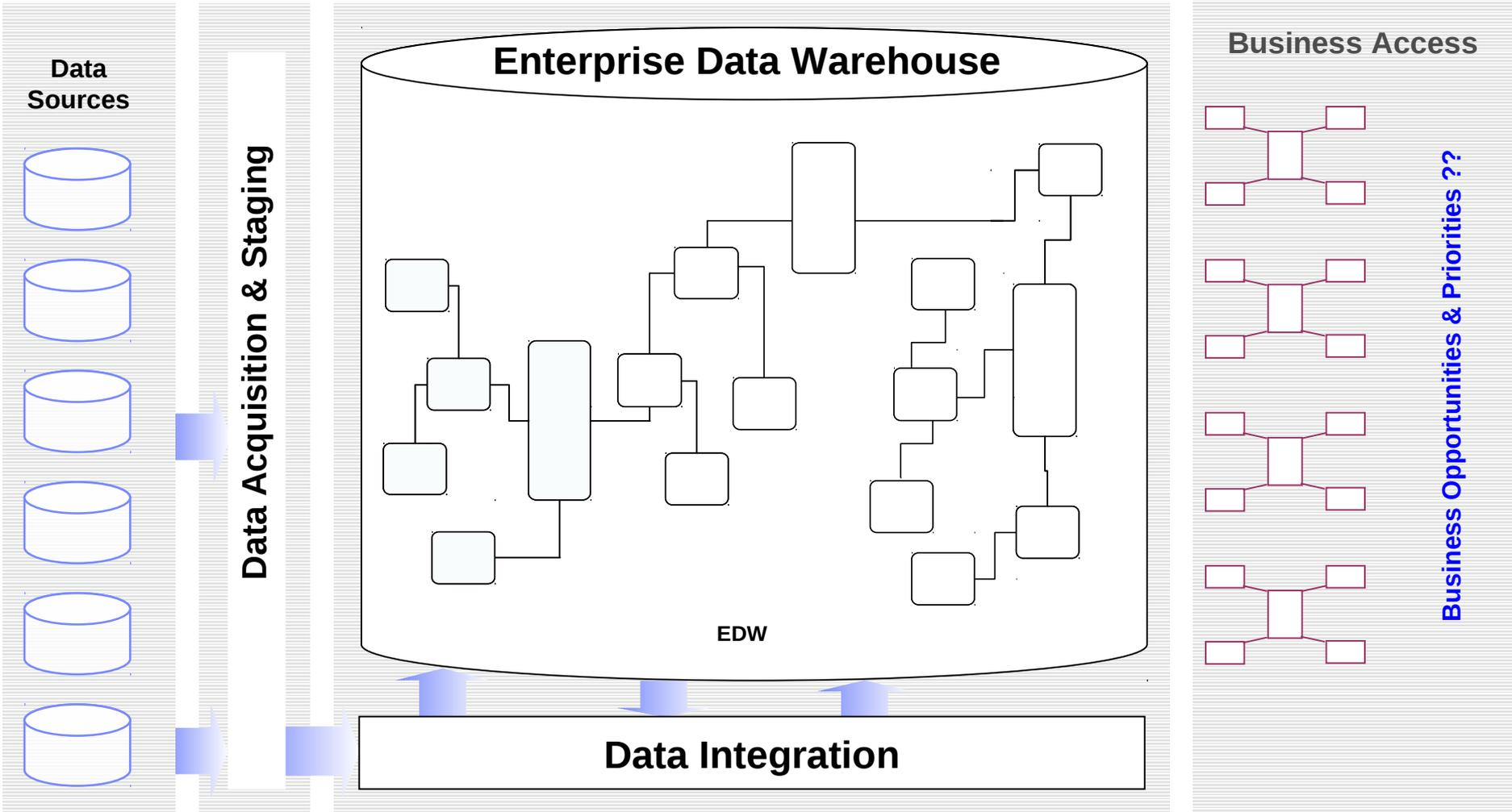
## Data-Driven Reference Architecture



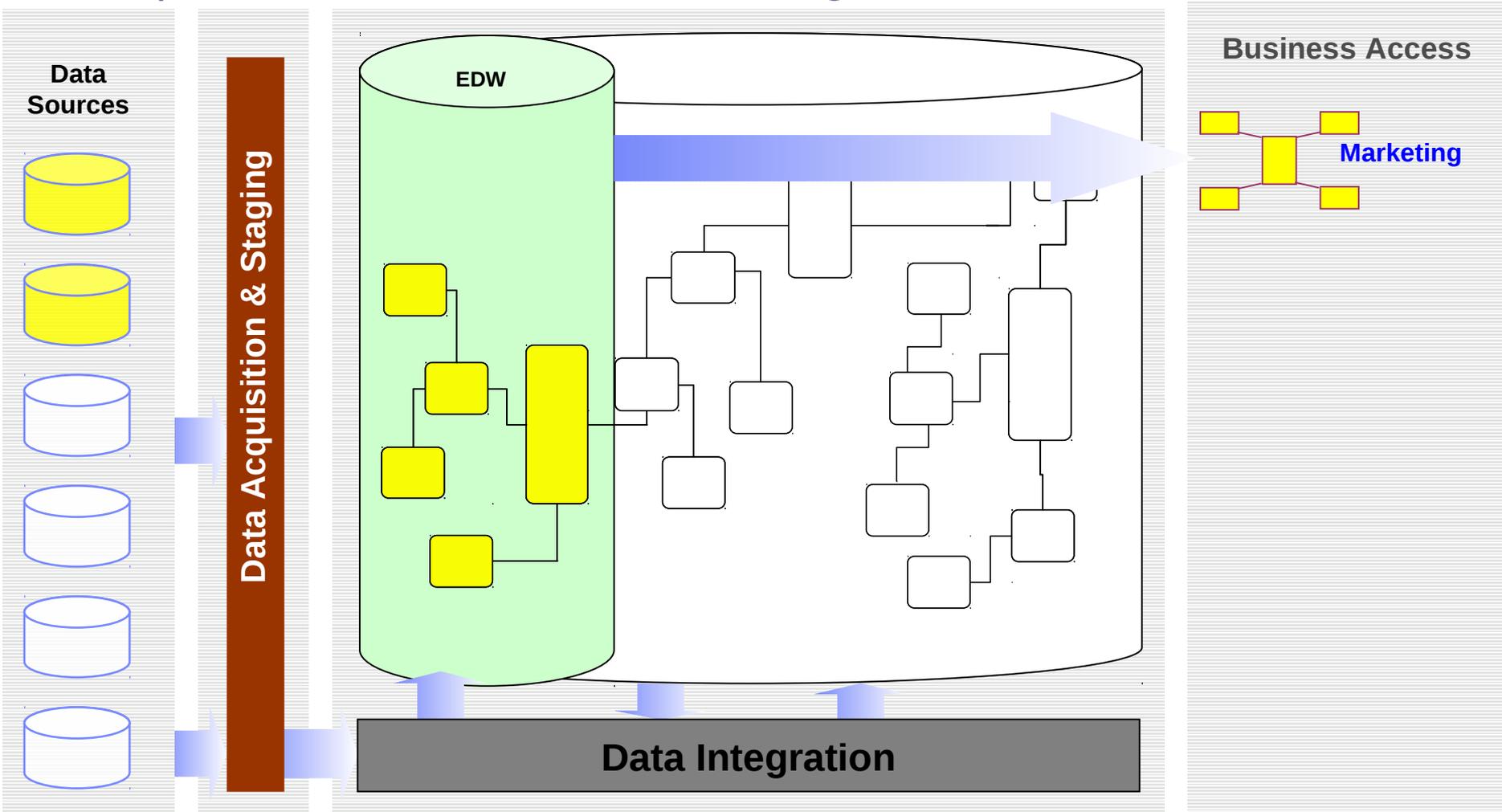
# Layered Data Architecture for Data Warehousing



# Enterprise Data Warehouse – Building Block Process

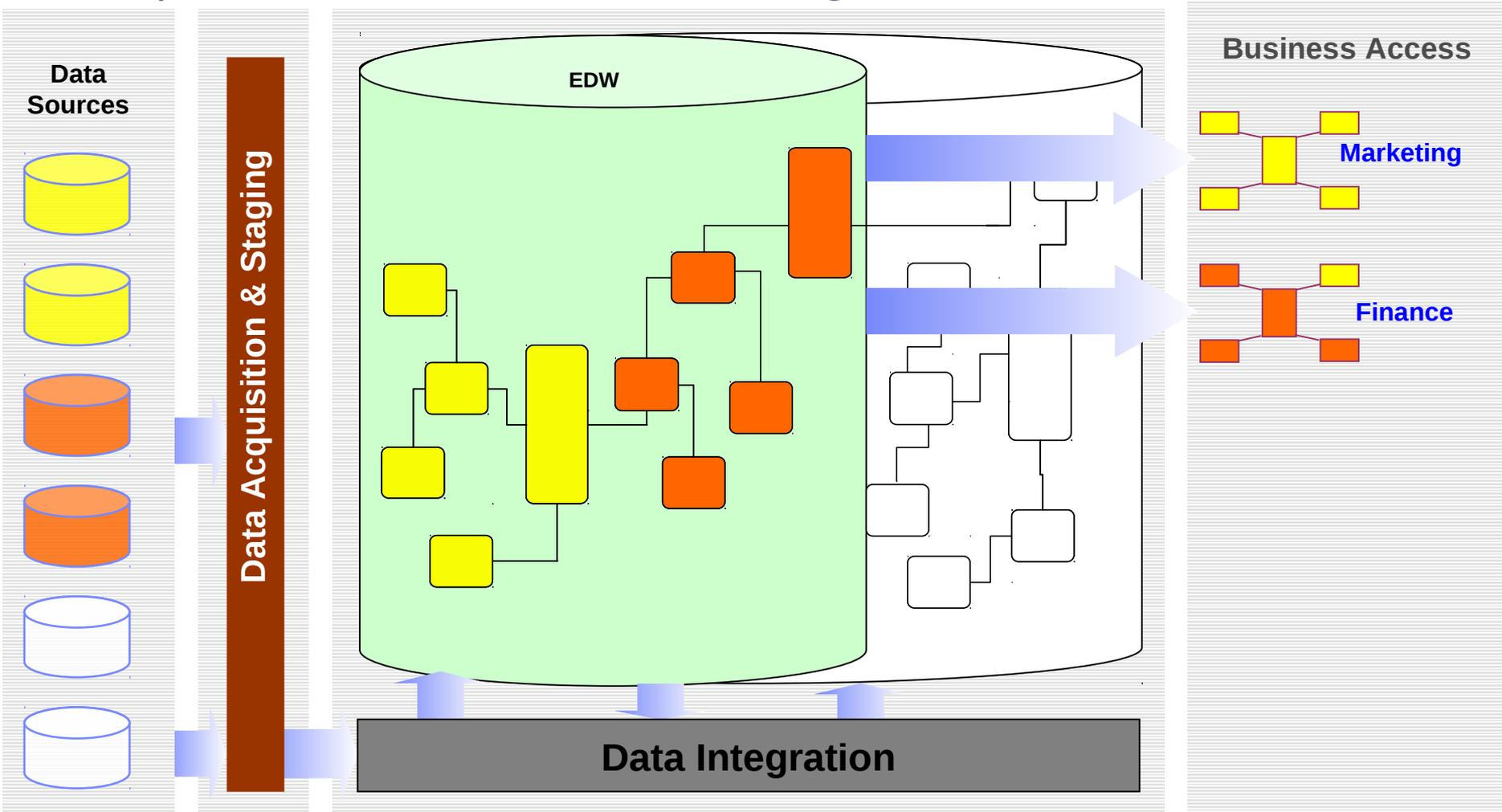


# Enterprise Data Warehouse – Building Block Process



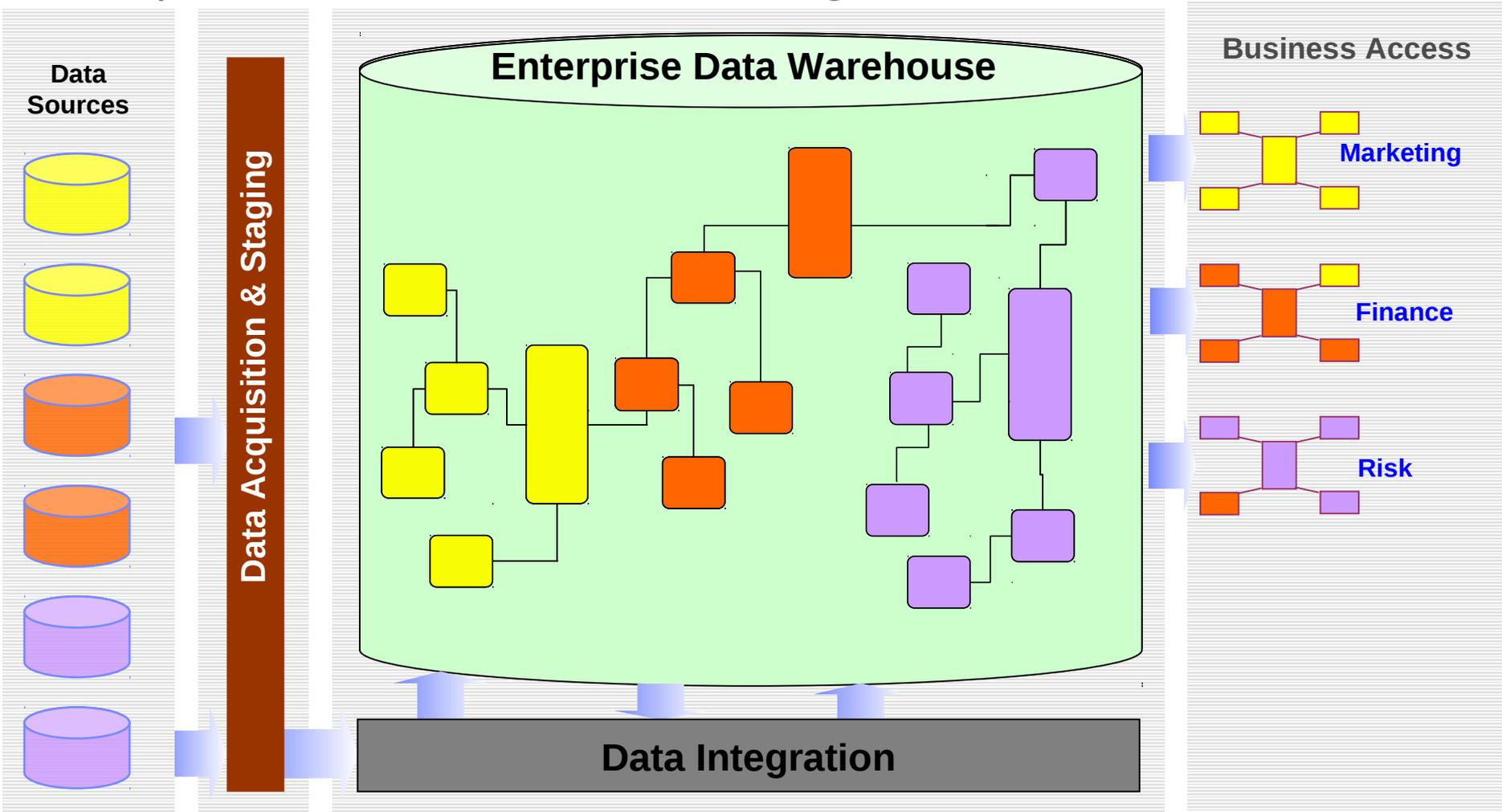
**Leverage Data Loads - Load Once and Use by Many**

# Enterprise Data Warehouse – Building Block Process



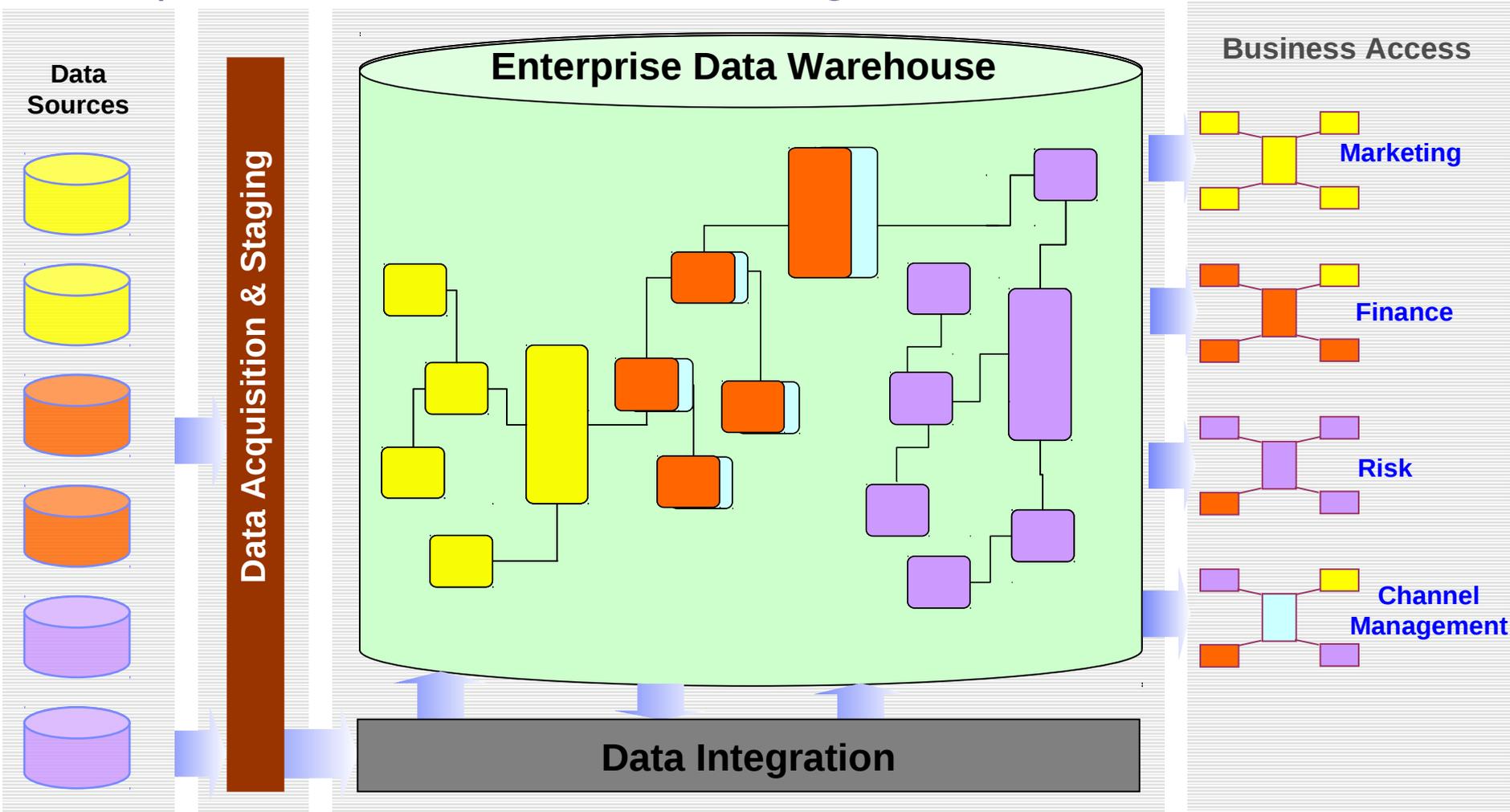
**Leverage Data Loads - Load Once and Use by Many**

# Enterprise Data Warehouse – Building Block Process



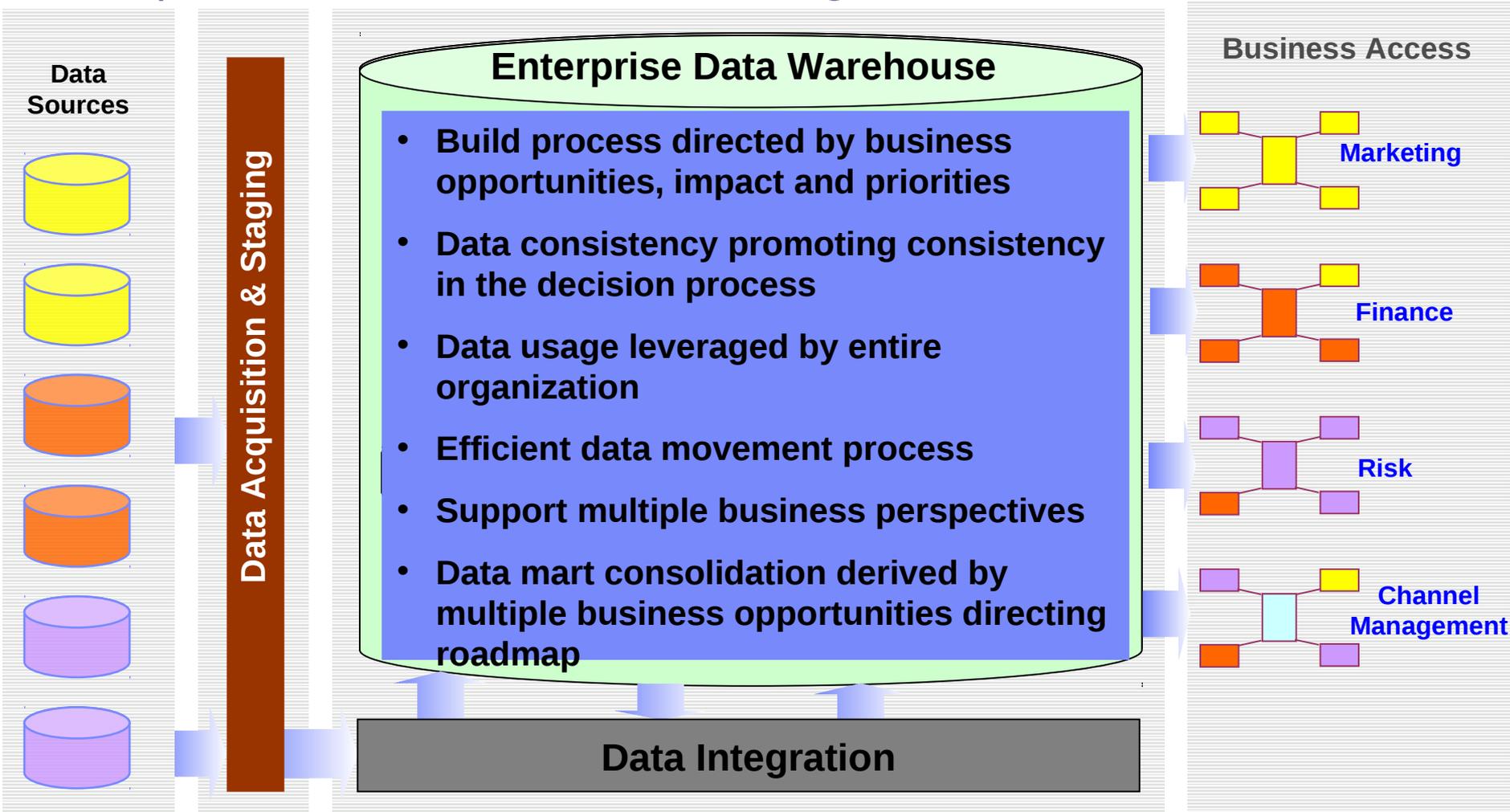
**Leverage Data Loads - Load Once and Use by Many**

# Enterprise Data Warehouse – Building Block Process



**Leverage Data Loads - Load Once and Use by Many**

# Enterprise Data Warehouse – Building Block Process

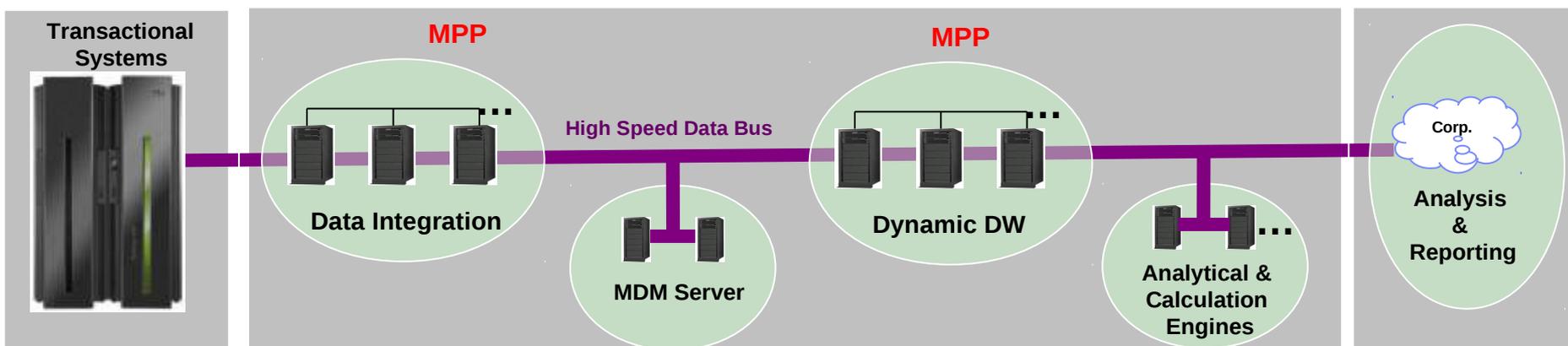


**Leverage Data Loads - Load Once and Use by Many**

# SW and HW Architecture for Data Warehousing

- Data Integration Servers
- Data Repository Servers
  - DW + DM, MDM
- Analytical Servers
  - Cognos, MicroStrategy, SAS, etc
- Application Servers
  - Calculation engines (Fermat, ILOG, etc)
- Communication networks
  - Switches, etc
- Backup, Restore, Archiving

	OLTP	DW
Processing of large volumes of data	No	Yes
Predictable queries	Yes	No
Response time is a function of database size	No	Yes
Query Complexity	Simple	Simple to Complex
Aging of Data	Current	Current/Historical
Process type	Static	Dynamic



# HW and SW Architecture for DW – Considerations

- Typical multiple components solution
  - Components of the solution should be configured/defined to avoid bottlenecks
  - Performance and functional aspects of the solution should be defined based on integrated tests
- Scalability and Parallel processing
  - Process large volume of data and transactions
  - Support execution of concurrent process
  - Linear scalability
- Modular growth
  - Vertical and horizontal growth to support new business demand
- Continuity of business operations
  - Maintain business operations in the event of an outage--with processes and infrastructures that are responsive, highly available and scalable
  - Reliability to ensure business continuity and resilience with information integrity
  - High availability to support mission critical applications
  - Process recovery
    - Backup and Restore due to processing failures/issues
  - Disaster and Recover
    - Recover system due to unexpected major issues into the infrastructure

# Data Warehouse Governance

## •Metadata

- Technical metadata
  - Support documentation of processes and assets of the solution
  - Allow impact analysis of the environment - Critical for maintenance and improvements
- Business metadata
  - Define business terms, calculations and formulas used in the decision process

## •Resource Management

- Performance management
  - Align I/T computing resources with business requirements
- Workload management
  - Assign resources to high priority LOBs, prevent low priority work from taking resources
    - ETL, Queries, etc
- Gerenciamento e monitoração de recursos e performance (ETL, *Queries*, etc.)

## •Capacity planning

- Provides historical information about utilization and growth of the environment

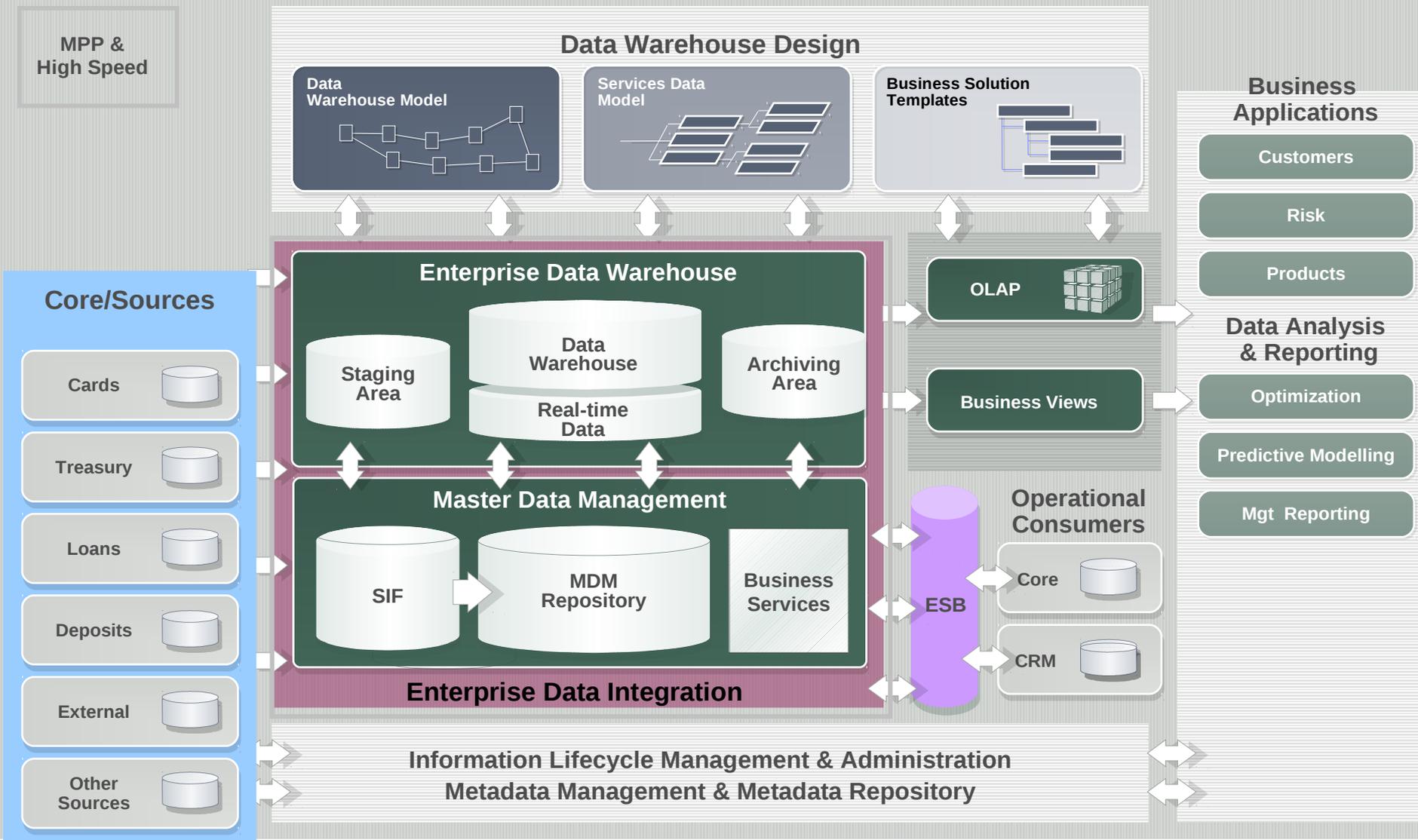
## •Centers of competency

- End users and IT
- Define policy for utilization of the DW

## •Security, privacy and data protection

- Access control, Audit

# Smart Enterprise Information Management Architecture



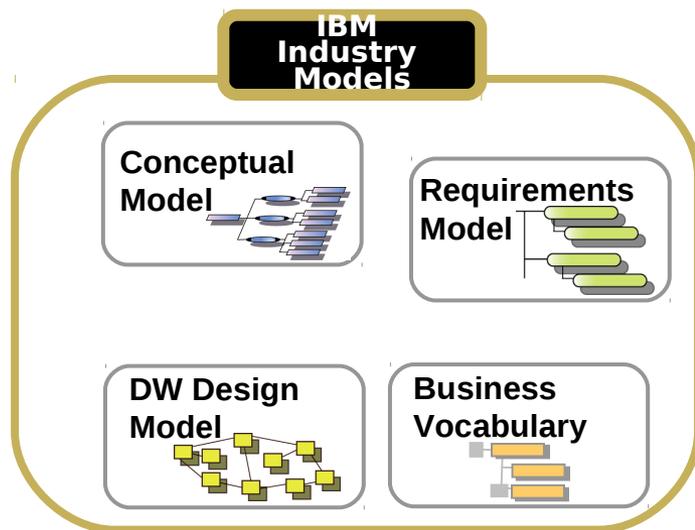
# What can go Wrong?

1. Data Outhouse - Built too fast; full of dirty, incomplete, out-of-date data; no-one will use it.
2. Data Basement - A DW with poor access and/or performance. Not used much.
3. Data Mausoleum - Like the basement, but built with the finest hardware/software.
4. Data Shack - Will soon collapse due to insufficient funding and management commitment.
5. Data Cottage - Individual department's own personal DW's. (Outside the company's full DW architecture, hence not a Data Mart). Allowed to carry on, you end up with a cute data village.
6. Data Jailhouse - Built to such a high spec, with such tight controls, that no-one can get access to the data, even though IT will swear it's there.
7. Data Tenement - The result of a chaos- or ostrich-based implementation strategy, where some outsider is trusted to build the DW for you. It ends up satisfying no particular business requirements but you do get to say you have one.

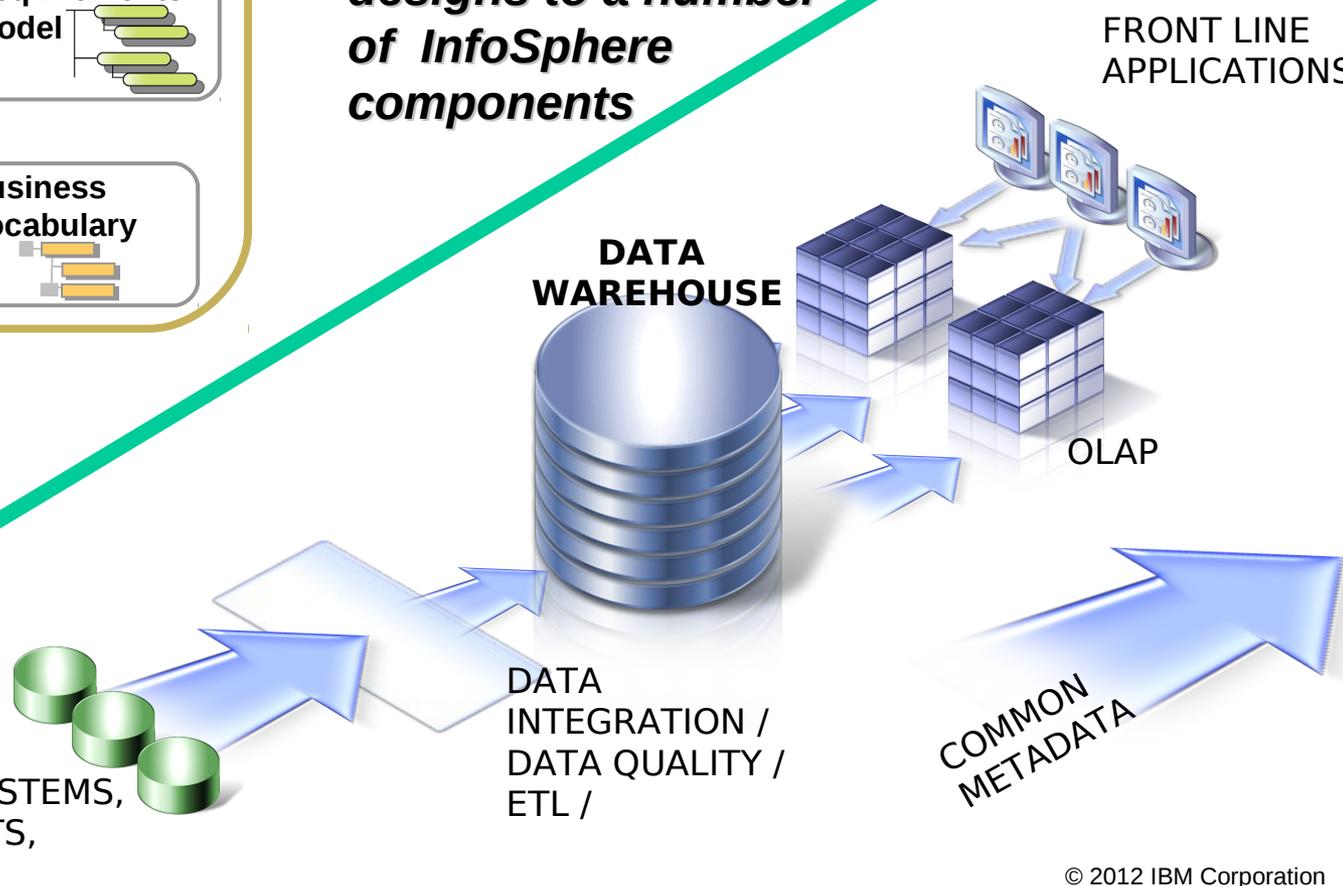
# IBM Industry Models

# IBM Industry Data Models

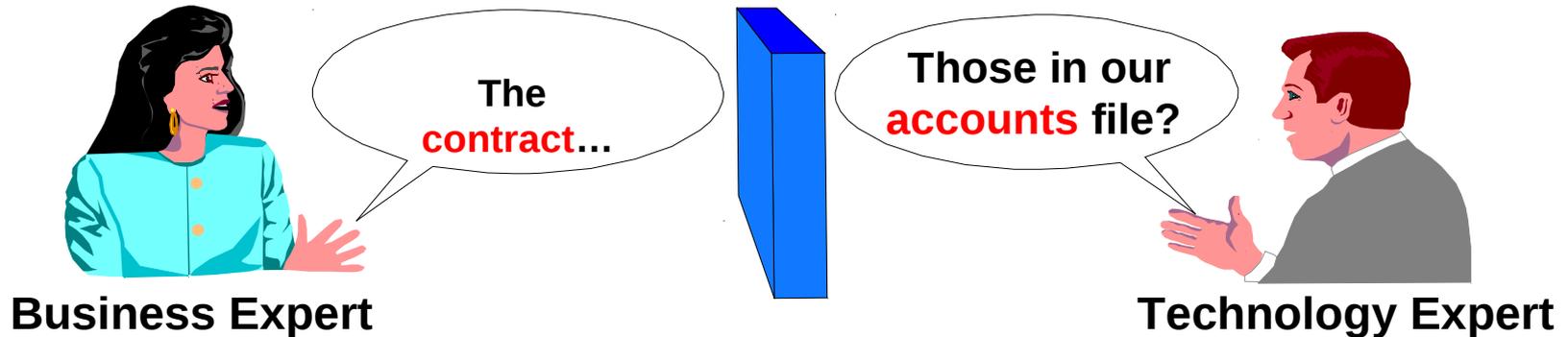
*Providing the Industry-specific Content to IBM InfoSphere Landscape*



**Provides key Industry-specific designs to a number of InfoSphere components**



The Business Conceptual Model enables the gathering of data requirements without misunderstandings



**Are *Contract* and *Account* two different data concepts or are they aliases?**

**We need to define a consolidated, definitive and single reference of truth**

**AND**

**We need to do it in a highly structured and auditable manner**

## Why use business models?

So why don't we just jump straight into development?

Imagine trying to co-ordinate and build a data mart / process / service without a plan?

Who has the complete picture of the business requirements?

How do you perform impact and gap analysis?

How do you identify overlap and reduce resource and material requirements?

How can you validate your deliverables?

How do you document the overall requirements?

How do you capture industry requirements beyond your own scope?

How will you extend it years from now when the requirements change?

- A business model records the details of the business in a comprehensive, integrated and thoroughly documented form
- It acts as communication mechanism between business analysts and technical specialists
- It drives the development of IT specifications, Reporting & Analytical requirements
- The Industry Models are designed to allowed phased and incremental projects

## Business Value of the Industry Models

### Why don't we just build our own model from scratch?

- IM brings together 20 years of experience in different industries
- Predefined and extensive solutions encompassing over 5000 business data items
- Integrated model solutions from business classification, through business process, data warehousing and service oriented architecture.
- Built in support for business challenges such as Basel II, IFRS/IAS, US GAAP, SOX, AML, KYC, KPI, MISMO, MiFID, etc.
- Well documented and tested data models
- Business consultants experienced in specific industry and project implementation
- Pre-empts data requirements often not discovered until late in the project
- Releases to include ongoing data requirements of industry directives and new initiatives

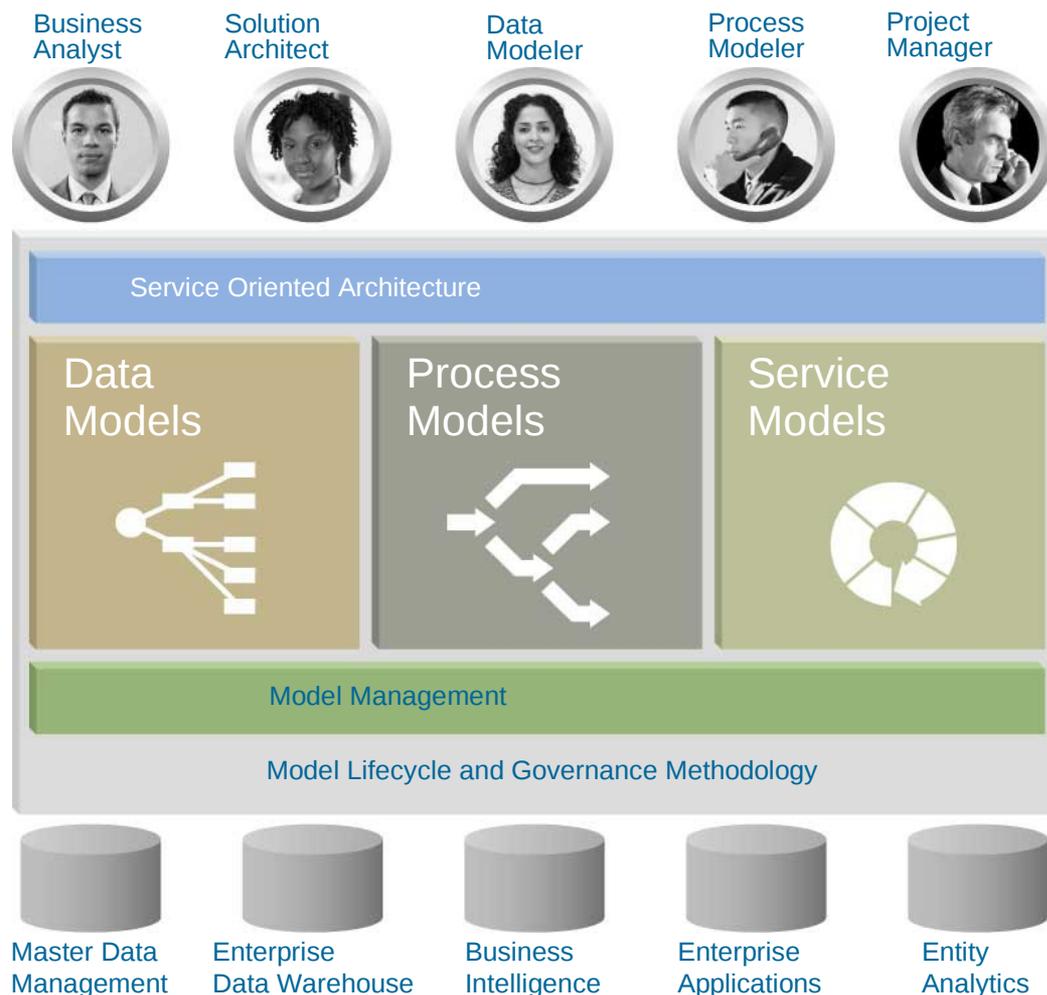
### What is the end deliverable?

- Depending on the Business Requirement and in an Industry Model data warehouse context the end deliverable is typically a [Data Warehouse / Mart / Process / Service](#)

## CONTENT + STRUCTURE

# Key Capabilities of the IBM Industry Model Portfolio

- Enables business users to easily scope and customize their own requirements
- Facilitates step-by-step business focused development and roll-out
- Delivers regularly updated business, technical and regulatory content
- Creates open technology platform for any application or integration solution
- Manages definitions and standards in complex IT environments



## Two Categories of DWH Models

- **Data Models**
  - Business content blueprint for a Data Warehouse and Data Mart design
  - Provides single analytical view of enterprise data
  - Banking, Insurance, Financial Markets, Retail, Telco, Health Plans
- **Process and Service Models**
  - Industry-specific business process and services designs
  - Used for business process optimization and core systems renewal
  - Banking, Insurance, Financial markets

# Data Models



## Banking (Data, Process and Services Models)

- Profitability, Relationship Marketing
- Risk Management
- Asset and Liability Mgmt
- Compliance
- Business Process re-engineering



## Insurance (Data, Process and Services Models)

- Customer centricity
- Claims, Policy, Underwriting
- Intermediary Performance
- Compliance
- Risk Management
- Business Process Re-engineering



## Financial Markets (Data, Process and Services Models)

- Risk Management
- Asset and Liability Mgmt
- Compliance
- KYC and Account Opening
- Middle/Back Office Transformation



## Health Plan (Health Plan Data Warehouse)

- Claims
- Medical Management
- Provider and Network
- Sales, Marketing and Membership
- Financials



## Retail (Retail Data Warehouse)

- Customer centricity
- Merchandising Management
- Store Operations & Product Mgmt
- Supply Chain Management
- Compliance



## Telco (Telecommunications Data Warehouse)

- Churn Management
- Relationship Mgmt and Segmentation
- Sales and Marketing
- Service Quality and Product Lifecycle
- Usage Profile

# Process and Service Models



## Banking (IFW Process Models)

- KYC / Account Opening
- Lending, Syndicated Lending
- Mortgages
- Savings, Investments & Deposits
- Wealth Management
- Sales & Relationship Management
- Product & Marketing Management
- Payments
- Regulatory and Compliance
- Human Resource Administration



## Financial Markets (Financial Markets Process Models)

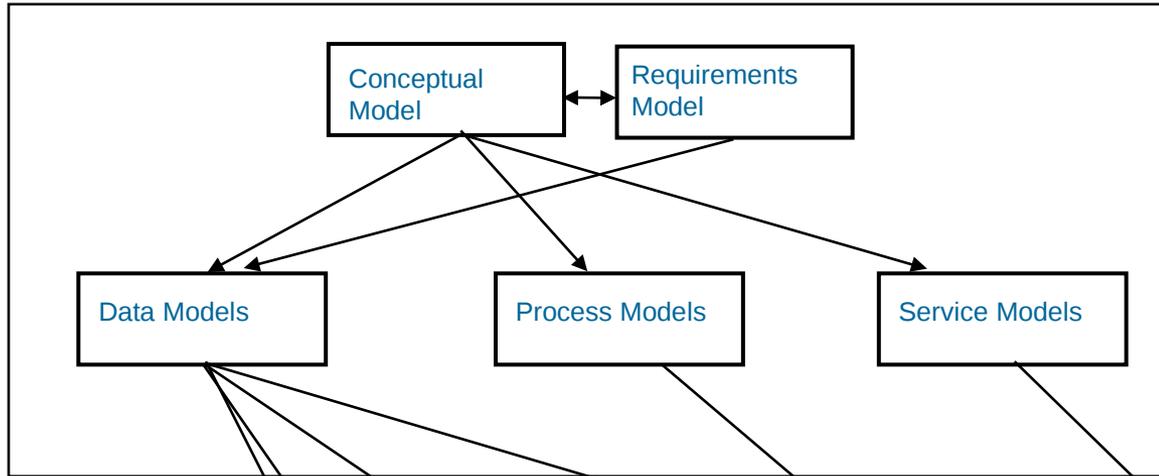
- KYC / Account Opening
- Lending, Syndicated Lending
- Mortgages
- Savings, Investments & Deposits
- Wealth Management
- Sales & Relationship Management
- Product & Marketing Management
- Payments
- Regulatory and Compliance
- Human Resource Administration
- Trade Processing
- Best Execution / MiFID



## Insurance (IAA Process Models)

- Enterprise Resource Management
- Channel Management and CRM
- Communications Management
- Marketing & Customer Acquisition
- Product Portfolio management
- Claim management
- Policy Administration
- Underwriting
- Financial transaction
- Reinsurance Management
- Investment Management
- Provider Management

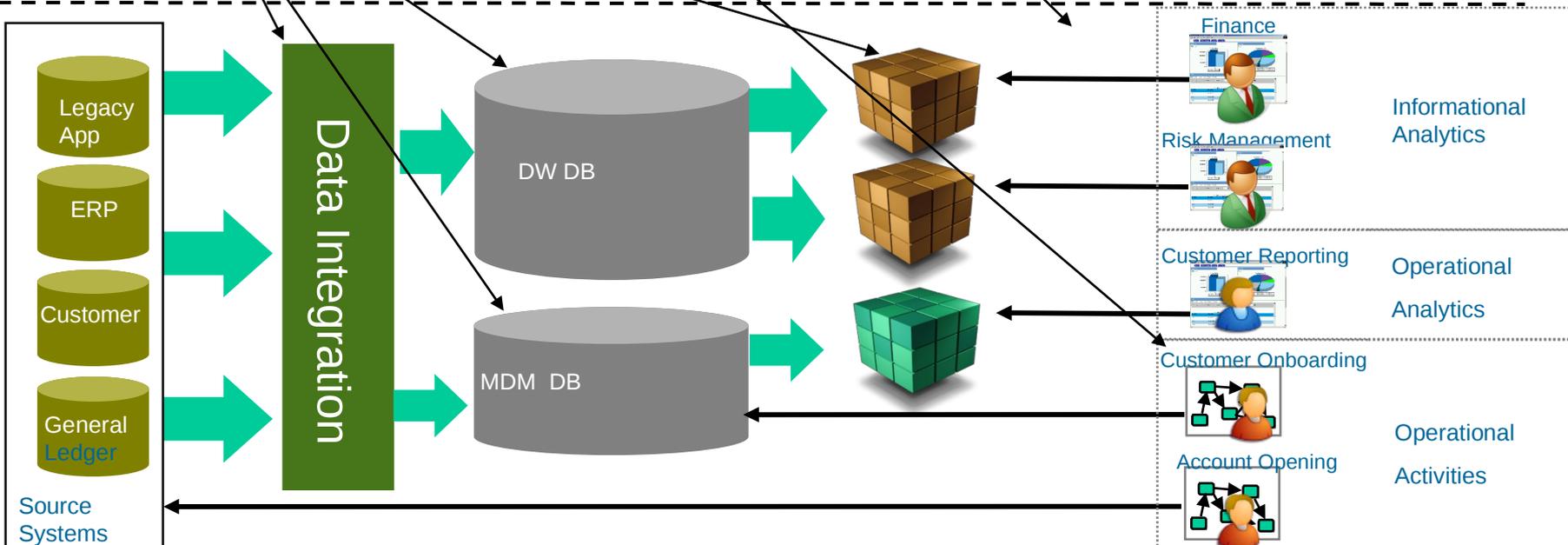
# Industry Data Models Landscape



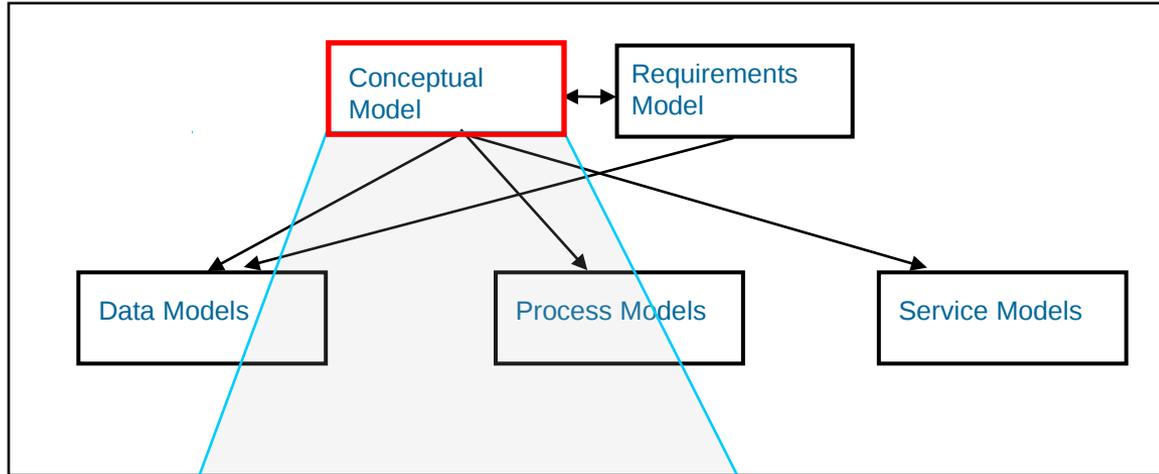
- Set of interlinked models covering Data, Process and Services areas
- Focuses on Industry-specific business issues
- Derived from a common Conceptual Model
- Enables/accelerates design-time activities

Design Time

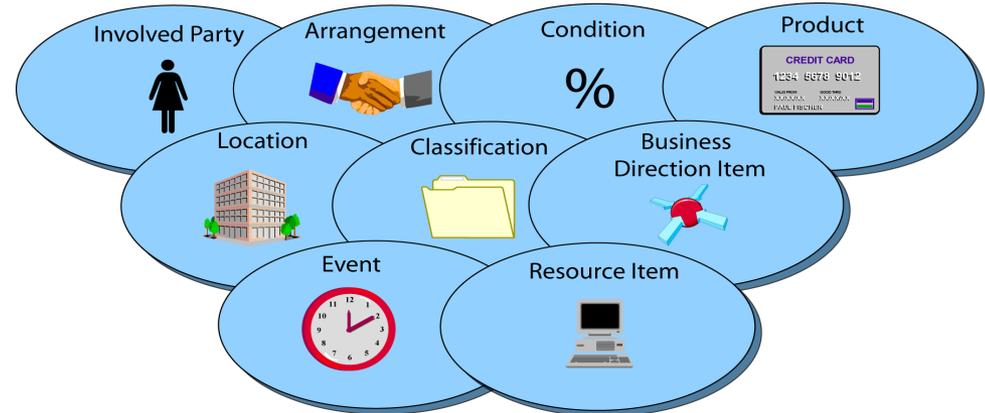
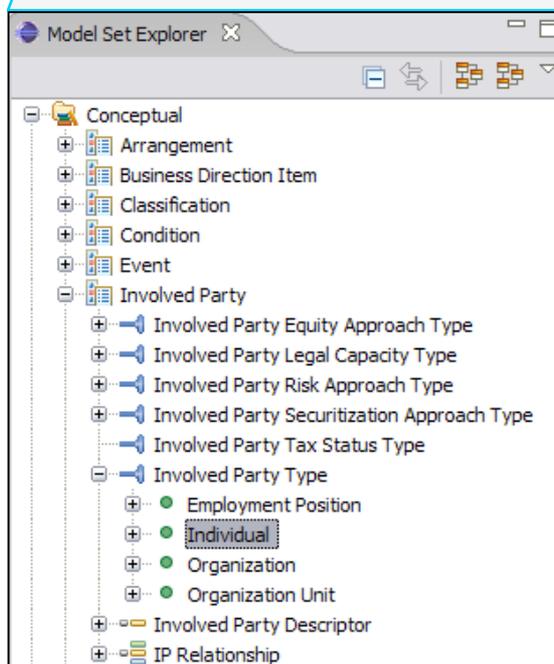
Run Time



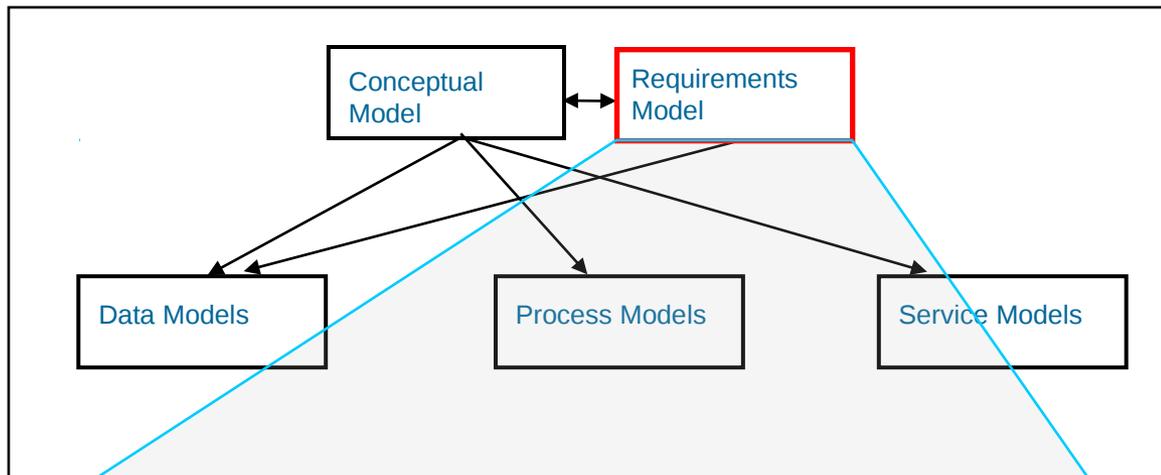
# Industry Models – Conceptual Model



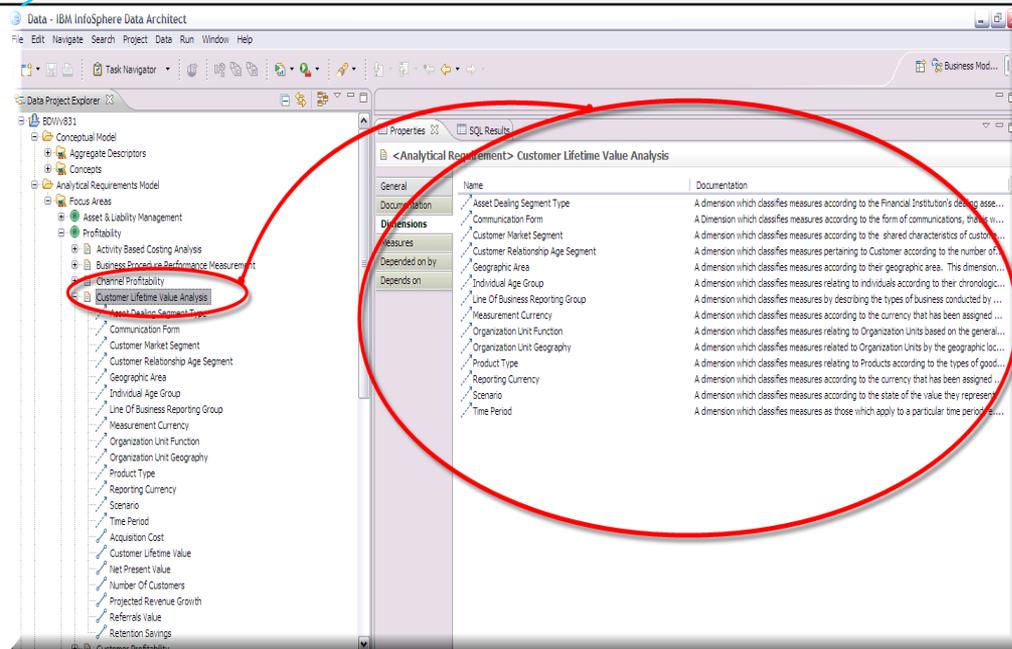
- Provides a structured data dictionary that defines the business terms and phrases used within a given industry
- Also provides any inter-relationships that exist between those terms and phrases.
- Provides the foundation for all down-stream technical models
- Consists of approx 3,000-5,000 fully defined business definitions (varies by Industry)



# Industry Models – Requirements Models



- Provides pre-defined groupings of requirements.
- Typically focused around industry-specific issues.
- Designed to provide accelerated scoping of the subset of the models content needed to address a specific business issue
- Consists of approx 50-90 business requirements groupings (groupings vary by Industry)



<b>Relationship Marketing</b>	<ul style="list-style-type: none"> <li>-Customer Interaction Analysis</li> <li>-Customer Investment Profile</li> <li>-Individual Customer Profile</li> <li>-Wallet Share Analysis</li> </ul>	<ul style="list-style-type: none"> <li>-Customer Complaints</li> <li>-Delinquency Analysis</li> <li>-Customer Loyalty</li> <li>-Market Analysis</li> </ul>	<ul style="list-style-type: none"> <li>-Campaign Analysis</li> <li>-Cross Sell Analysis</li> <li>-Customer Attrition</li> <li>-Customer Behavior</li> <li>-Lead Analysis</li> </ul>
<b>Profitability</b>	<ul style="list-style-type: none"> <li>-Transaction Analysis</li> <li>-Activity Based Costing Analysis</li> <li>-Insurance Product Analysis</li> <li>-Investment Arrangement Analysis</li> </ul>	<ul style="list-style-type: none"> <li>-Profitability Analysis</li> <li>-Channel Profitability</li> <li>-Customer Lifetime Value</li> <li>-Customer Profitability</li> <li>-Location Profitability</li> </ul>	<ul style="list-style-type: none"> <li>-Product Profitability</li> <li>-Performance Measurement</li> <li>-Organization Unit Profitability</li> <li>-Business Procedure Performance</li> </ul>
<b>Risk</b>	<ul style="list-style-type: none"> <li>-Interest Rate Risk Analysis</li> <li>-Credit Risk Profile</li> <li>-Credit Risk Assessment</li> <li>-Credit Risk Mitigation Assessment</li> <li>-Asset Securitization Analysis</li> <li>-Operational Risk Assessment</li> </ul>	<ul style="list-style-type: none"> <li>-Outstandings Analysis</li> <li>-Portfolio Credit Exposure</li> <li>-Liquidity Risk</li> <li>-Collections Analysis</li> <li>-Insurance Risk Profile</li> </ul>	<ul style="list-style-type: none"> <li>-Authority Profiling</li> <li>-Credit Risk Analysis</li> <li>-Debt Restructuring</li> <li>-Involved Party Exposure</li> <li>-Location Exposure</li> <li>-Non Performing Loan</li> <li>-Operational Risk Loss Analysis</li> </ul>
<b>Asset &amp; Liability Management</b>	<ul style="list-style-type: none"> <li>-Interest Rate Sensitivity</li> <li>-Liquidity Analysis</li> <li>-Short Term Funding Management</li> <li>-Financial Management Accounting</li> </ul>	<ul style="list-style-type: none"> <li>-Capital Allocation Analysis</li> <li>-Capital Procurement</li> <li>-Credit Loss Provision</li> <li>-Funds Maturity Analysis</li> <li>-Income Analysis</li> </ul>	<ul style="list-style-type: none"> <li>-Net Interest Margin Variance</li> <li>-Structured Finance Analysis</li> <li>-Equity Position Exposure</li> <li>-Position Valuation Analysis</li> </ul>
<b>Compliance</b>	<ul style="list-style-type: none"> <li>-European Central Bank Reporting</li> <li>-Financial Capital Adequacy Analysis</li> <li>-Structure Of Regulatory Capital</li> <li>-Foreign Financial Account Analysis</li> <li>-Suspicious Activity Analysis</li> <li>-Transaction Activity Analysis</li> <li>-SOA Balance Sheet Analysis</li> <li>-SOA Cash Flow Analysis</li> <li>-SOA Statement Of Change In Shareholders' Equity Analysis</li> <li>-SOA Statement Of Income Analysis</li> </ul>	<ul style="list-style-type: none"> <li>-Balance Sheet Portfolio Basis Approach Analysis</li> <li>-Balance Sheet Classified Approach Analysis</li> <li>-Balance Sheet Order Of Liquidity Approach Analysis</li> <li>-Suspicious Activity Analysis</li> <li>-Cash Flow Direct Analysis</li> <li>-Cash Flow Indirect Analysis</li> <li>-Income Statement</li> </ul>	<ul style="list-style-type: none"> <li>-Cash Flow Direct Financial Institution Analysis</li> <li>-Cash Flow Indirect Financial Institution Analysis</li> <li>-Income Statement By Nature Analysis</li> <li>-Income Statement Financial Institution Approach Analysis</li> <li>-Cash Flow Direct Analysis</li> <li>-Cash Flow Indirect Analysis</li> <li>-Statement Of Changes In Equity Analysis</li> </ul>

# BDW – Analytical Requirements

## Relationship Marketing



- Campaign Analysis
- Cross Sell Analysis
- Customer Attrition Analysis
- Customer Behaviour
- Customer Complaints Analysis
- Customer Delinquency Analysis
- Customer Experience Analysis
- Customer Interaction Analysis
- Customer Investment Profile
- Customer Loyalty
- Individual Customer Profile
- Lead Analysis
- Market Analysis
- Wallet Share Analysis

## Profitability



- Activity Based Costing Analysis
- Business Procedure Performance Measurement
- Channel Profitability
- Customer Lifetime Value Analysis
- Customer Profitability
- Insurance Product Analysis
- Investment Arrangement Analysis
- Location Profitability
- Organization Unit Profitability
- Performance Measurement
- Product Analysis
- Product Profitability
- Profitability Analysis
- Transaction Profitability Analysis

## Risk Management



- Authority Profiling
- Collections Analysis
- Credit Risk Analysis
- Credit Risk Assessment
- Credit Risk Mitigation Assessment
- Customer Credit Risk Profile
- Debt Restructure Analysis
- Insurance Risk Profile
- Interest Rate Risk Analysis
- Involved Party Exposure
- Liquidity Risk Analysis
- Location Exposure
- Non Performing Loan Analysis
- Operational Risk Assessment
- Operational Risk Loss Analysis
- Outstandings Analysis
- Portfolio Credit Exposure
- Securitization Analysis
- Security Analysis
- Value At Risk Analysis

## Asset & Liability Management

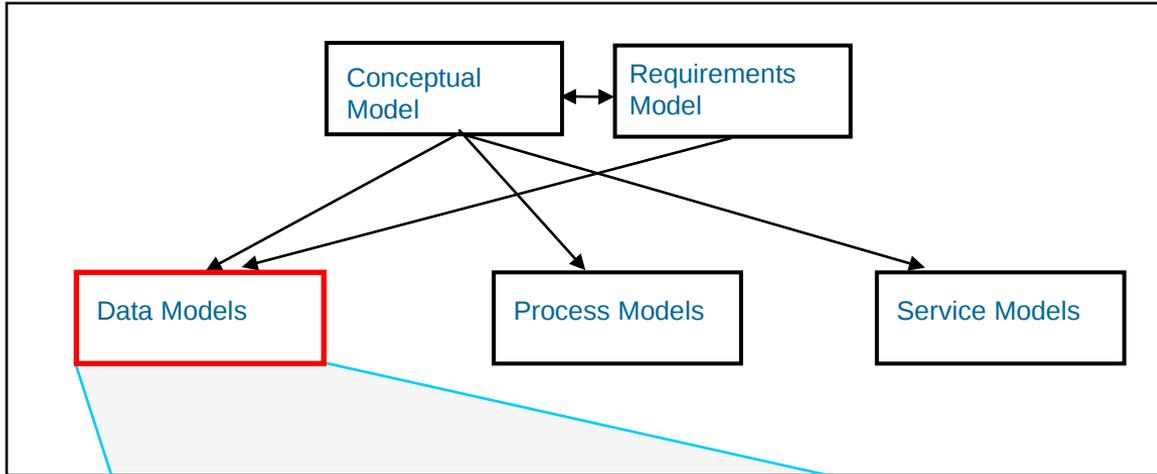
- Capital Allocation Analysis
- Capital Procurement
- Credit Loss Allowance Analysis
- Equity Position Exposure
- Financial Management Accounting
- Financial Market Transaction Analysis
- Funds Maturity Analysis
- High Value Outward Payment
- Income Analysis
- Interest Rate Sensitivity Analysis
- Inward Payment Rate Tolerance
- Inward Payment User Activity
- Inward Payments
- Inward Payments Volume
- Liquidity Analysis
- Net Interest Margin Variance
- Outward Payments
- Positions Analysis
- Short Term Funding Management
- Structured Finance Analysis
- VWAP Analysis

## Regulatory Compliance

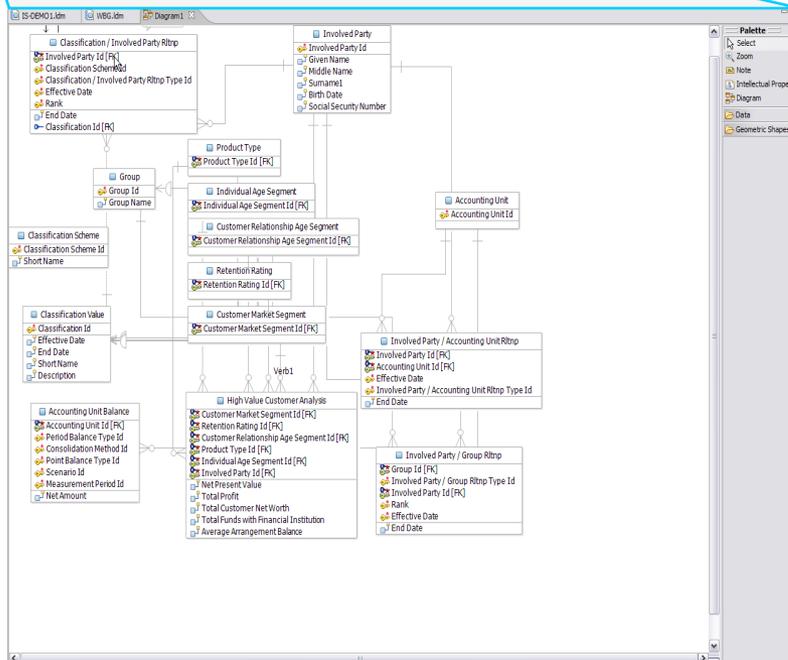


- Best Execution Analysis
- Continuous Auction Analysis
- ECB Reporting
- Financial Capital Adequacy Analysis
- Foreign Financial Account Analysis
- Transaction Activity Analysis
- Transaction Reporting Analysis
- Periodic Auction Analysis
- Quarterly Transaction Reporting Analysis
- Quote Driven Analysis
- Sarbanes Oxley Act Analysis (SOX)
- Sarbanes Oxley Act Balance Sheet Analysis
- Sarbanes Oxley Act Cash Flow Analysis
- Sarbanes Oxley Act Statement Of Income Analysis
- Sarbanes Oxley Act Stmt Chg Shrhldr Eqty Anlys
- Structure Of Regulatory Capital
- Suspicious Activity Analysis

# Industry Models – Data Warehouse Models



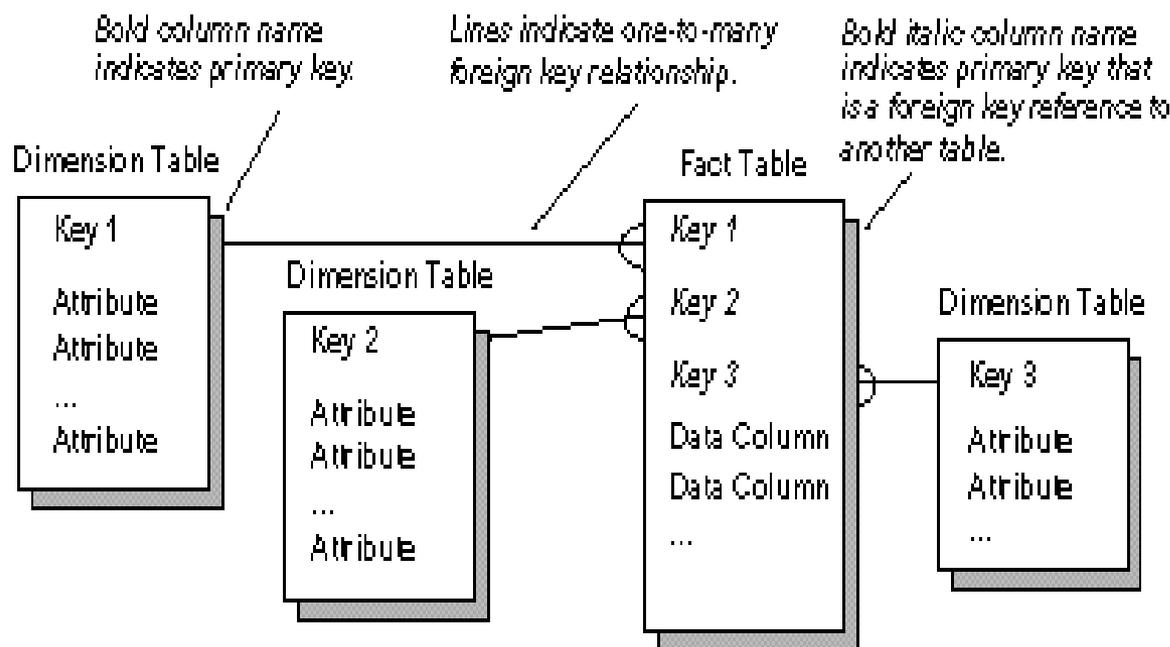
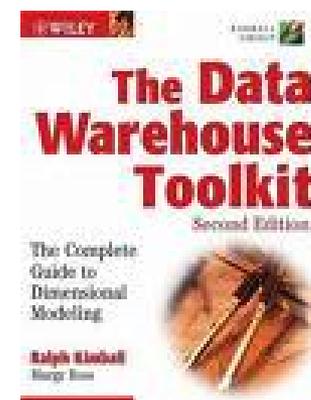
- Describes the logical data structures needed for the design of a central warehouse
- Designed to provide generic, flexible blueprint for cross-LOB data storage
- Incorporates structures to maximize the efficiency of long-term storage of historical facts and associated relationships.
- Typically consists of 1,000+ logical entities (or 300-400 table definitions)



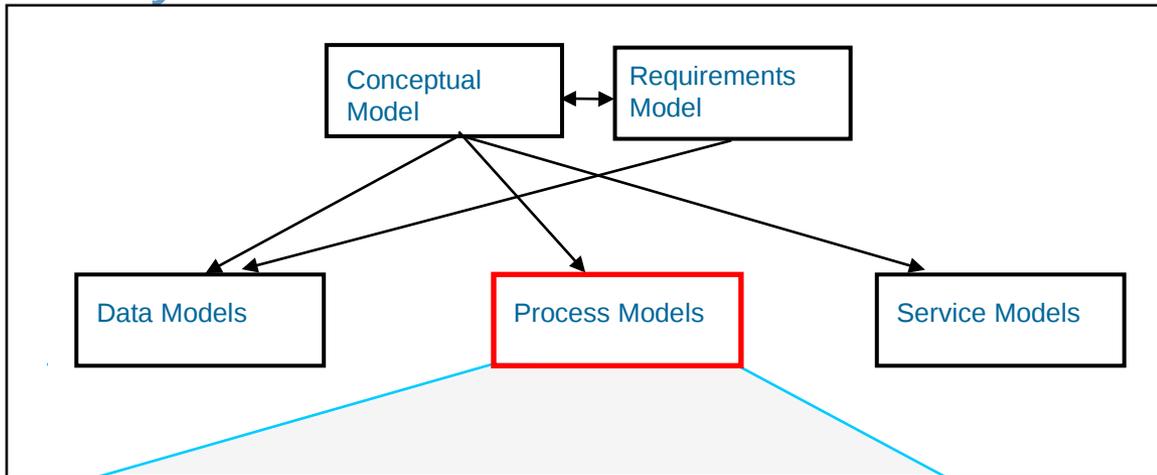
# Star Schema Basics

→ Composed Of:

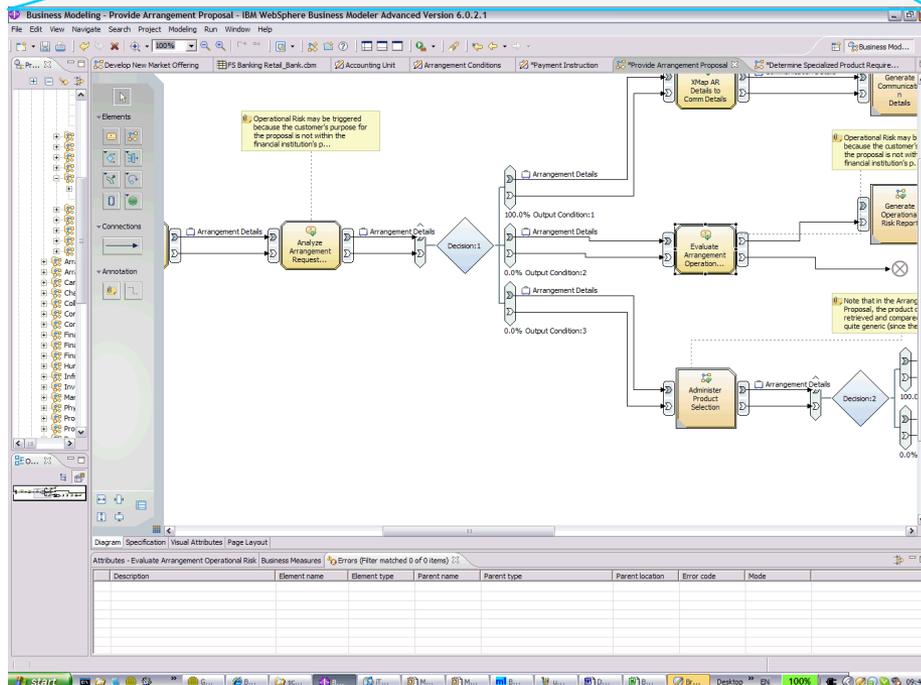
- Fact tables
- Dimension Tables



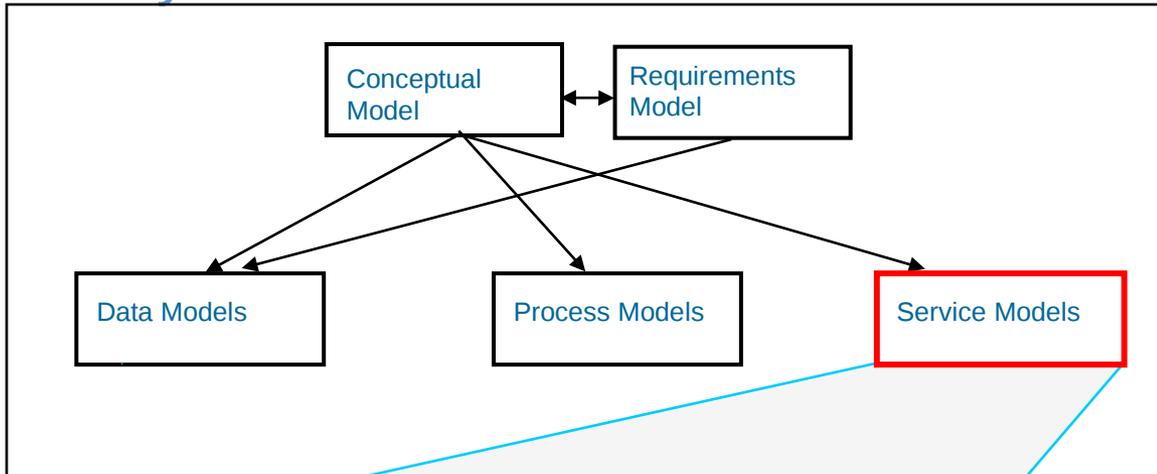
# Industry Models – Process Models



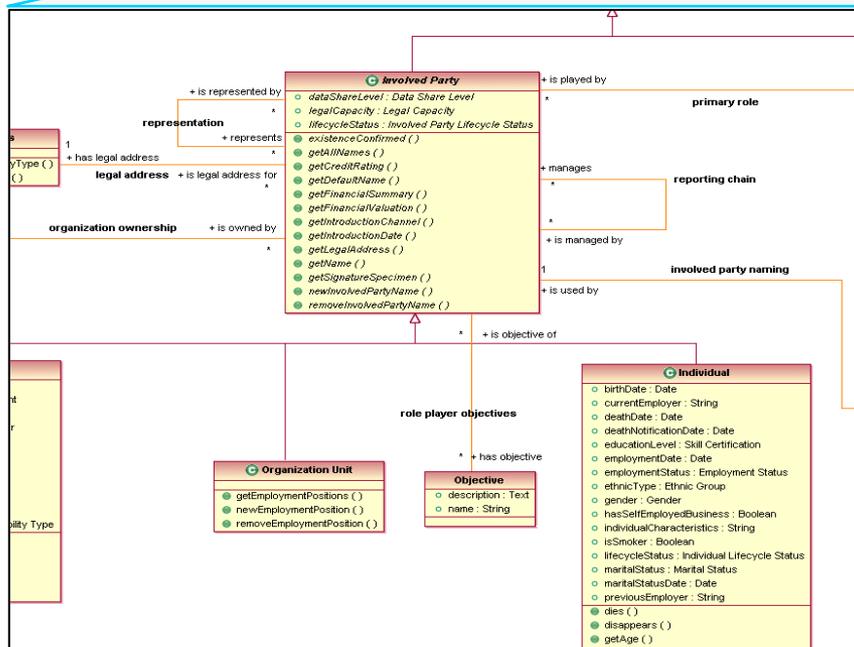
- Describes at an analysis level the specific business process flows.
- Provide a pre-defined comprehensive starting point for Business Process re-engineering efforts and SOA implementations.
- Used by Financial Services organizations to accelerate the detailed definition of business processes.
- Over 500 workflows across Financial Services



# Industry Models – Service Models



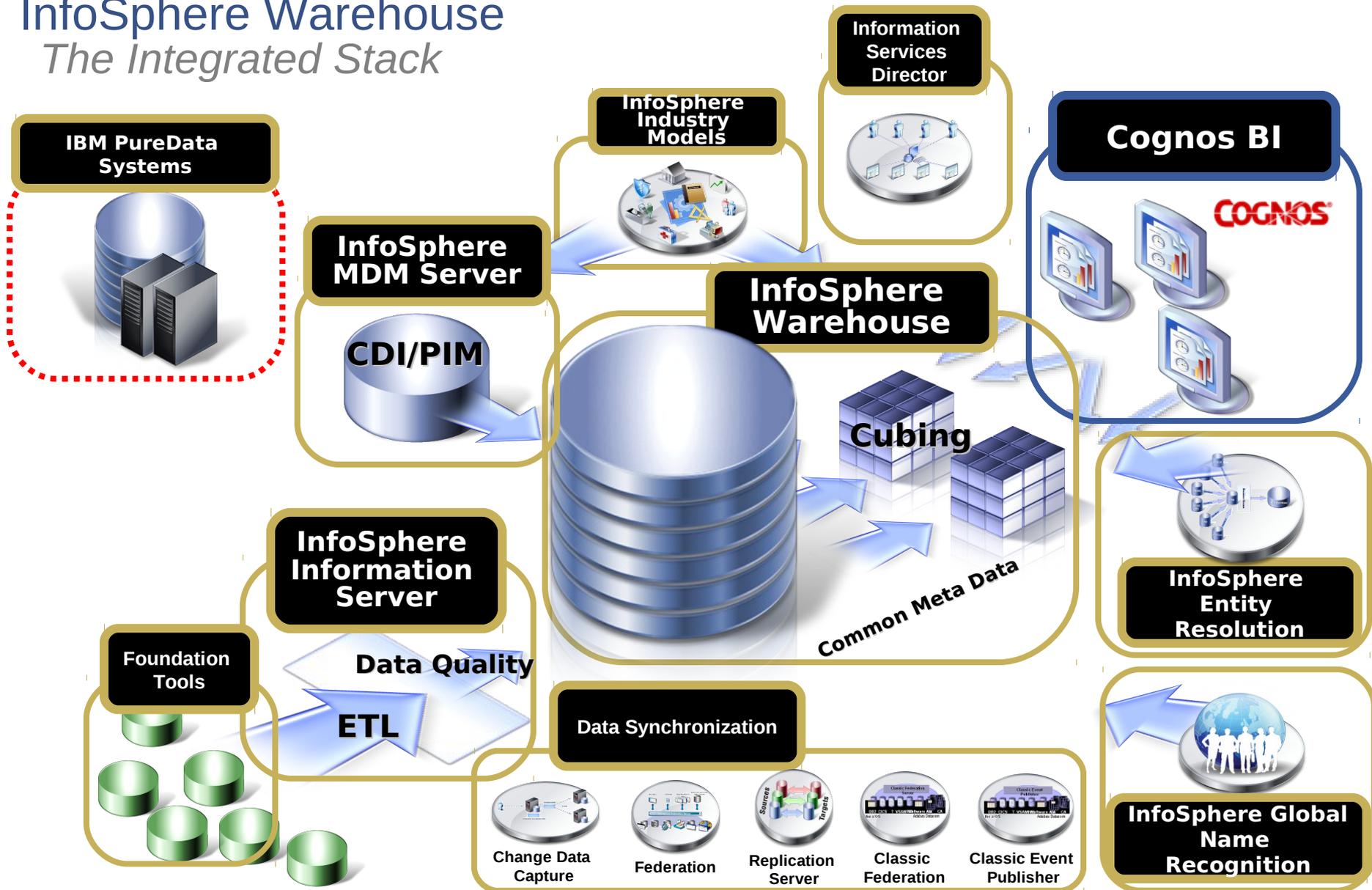
- Provides generic and flexible view of the components and services needed a Financial Services institution.
- Consists of both analysis and design level pre-defined UML structures, designed to accelerate component or services development
- Tight linkage to the Process Models.
- Over 350 business Model Objects supporting 400 use cases (for Banking)



# IBM Data Warehouse and Business Analytics software portfolio

# InfoSphere Warehouse

*The Integrated Stack*



# In Order to Realize New Opportunities, You Need to Think Beyond Traditional Sources of Data

## Transactional and Application Data



- Volume
- Structured
- Throughput

## Machine Data



- Velocity
- Semi-structured
- Ingestion

## Social Data



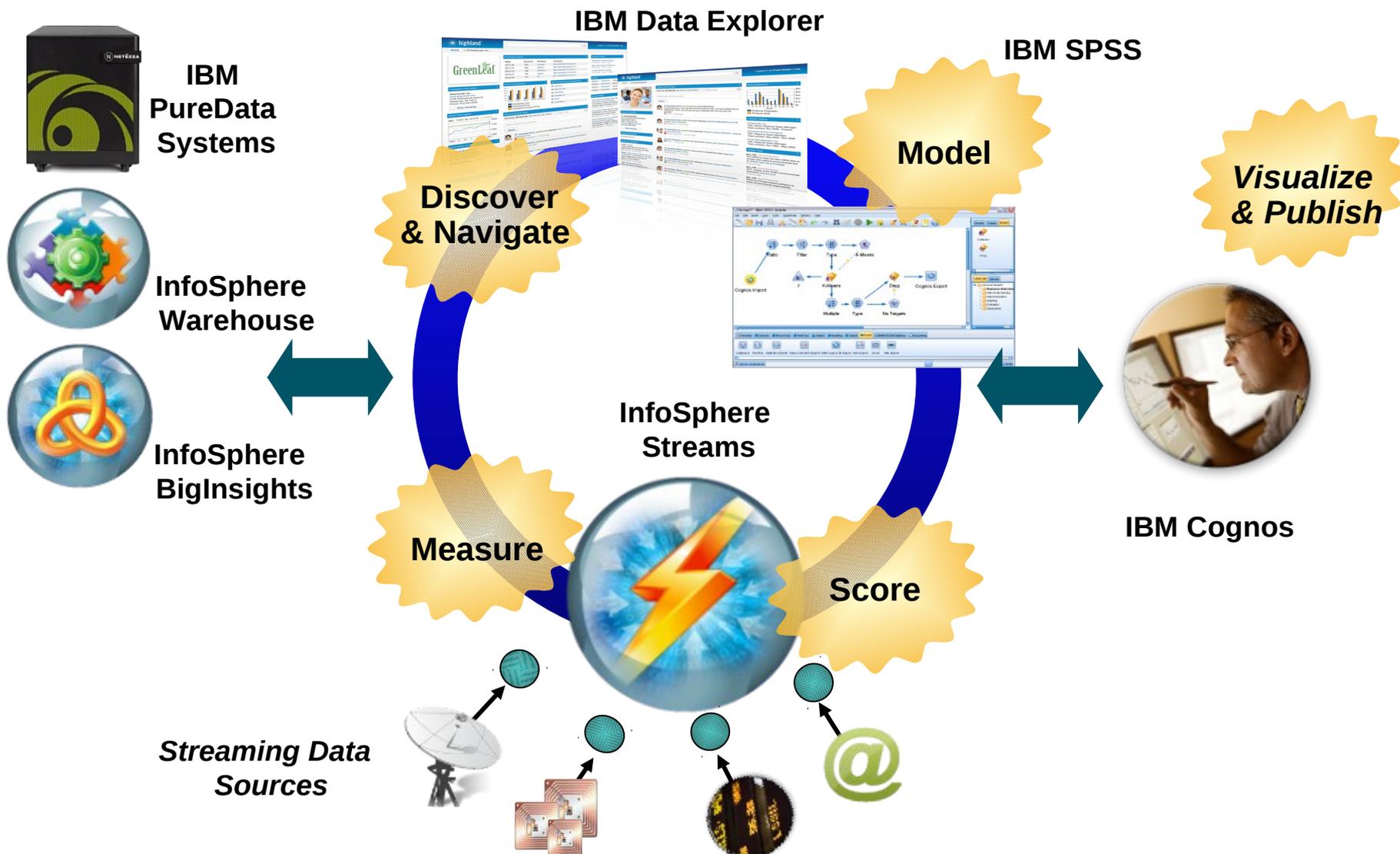
- Variety
- Highly unstructured
- Veracity

## Enterprise Content



- Variety
- Highly unstructured
- Volume

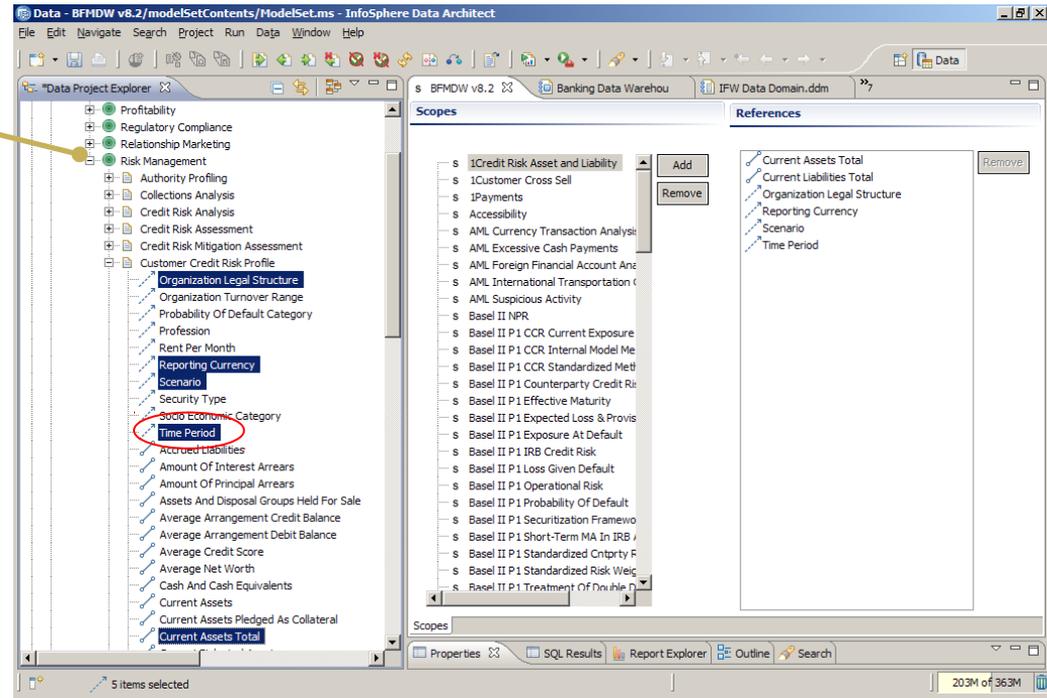
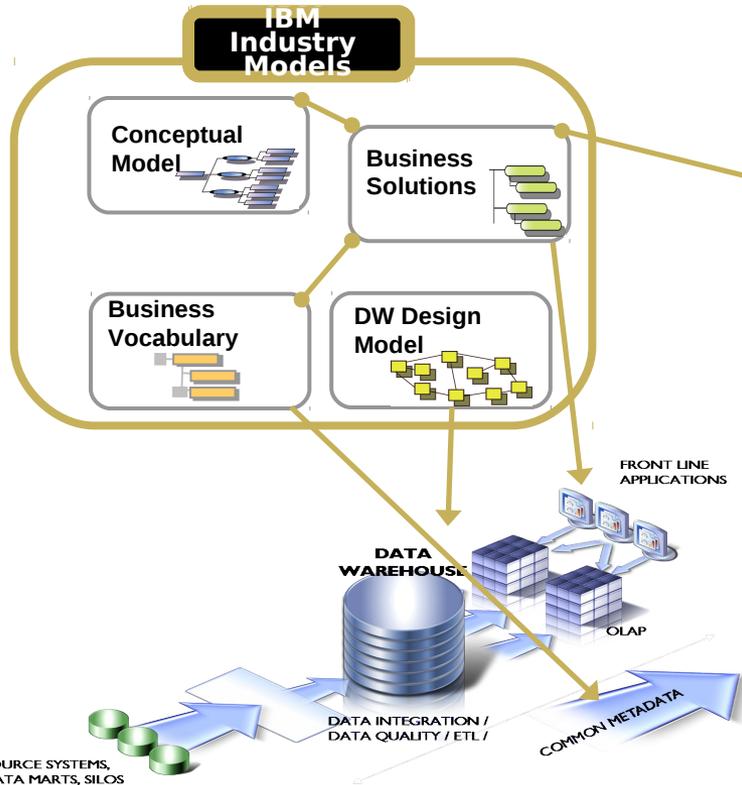
# Putting it all together ...end-to-end big data solution



# 5 steps to build a Cognos Report from an Industry Model

# Step 1 – Select key measures and dimensions

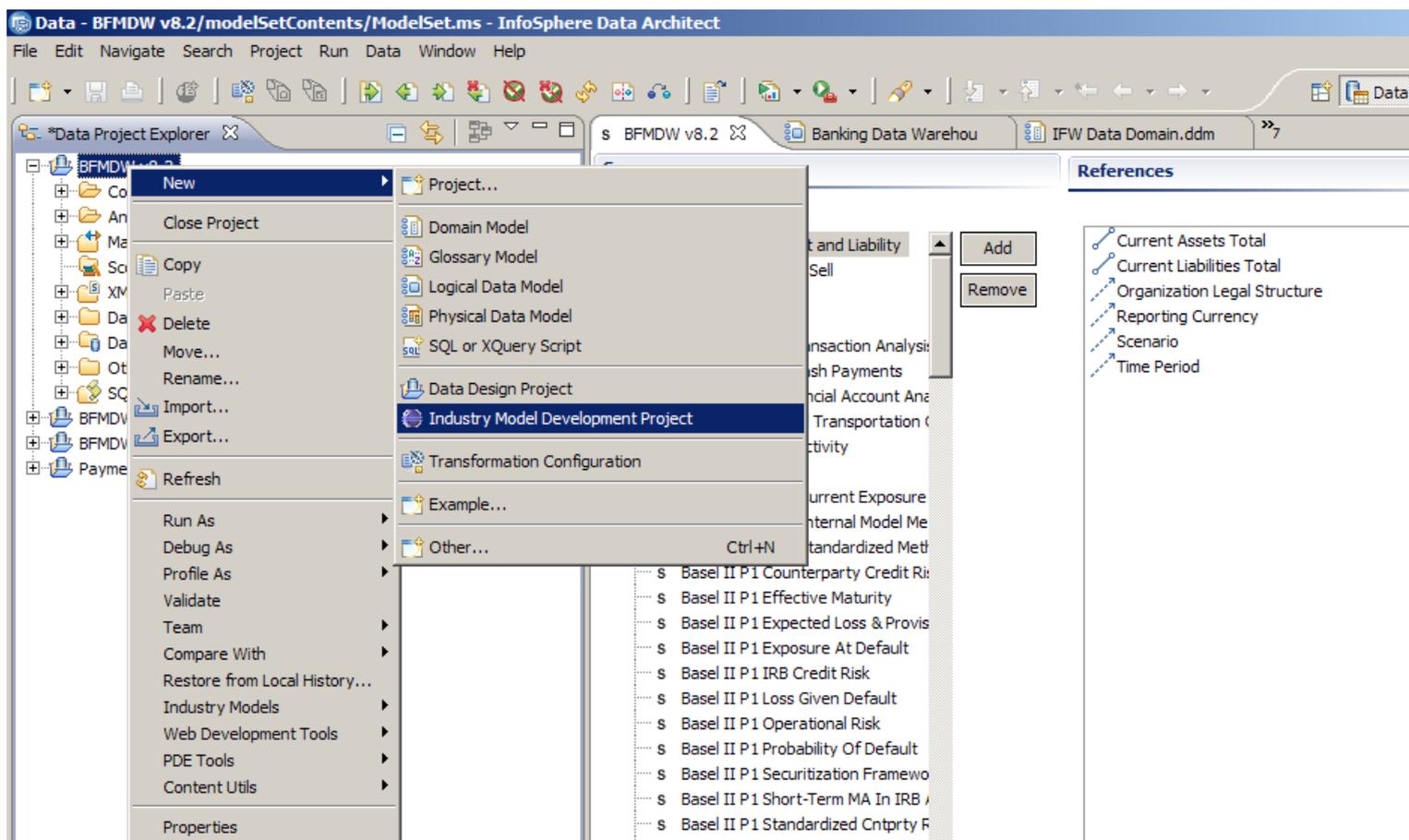
- Simple drag and drop into a project scope



Time Period dimension used as an example during the steps

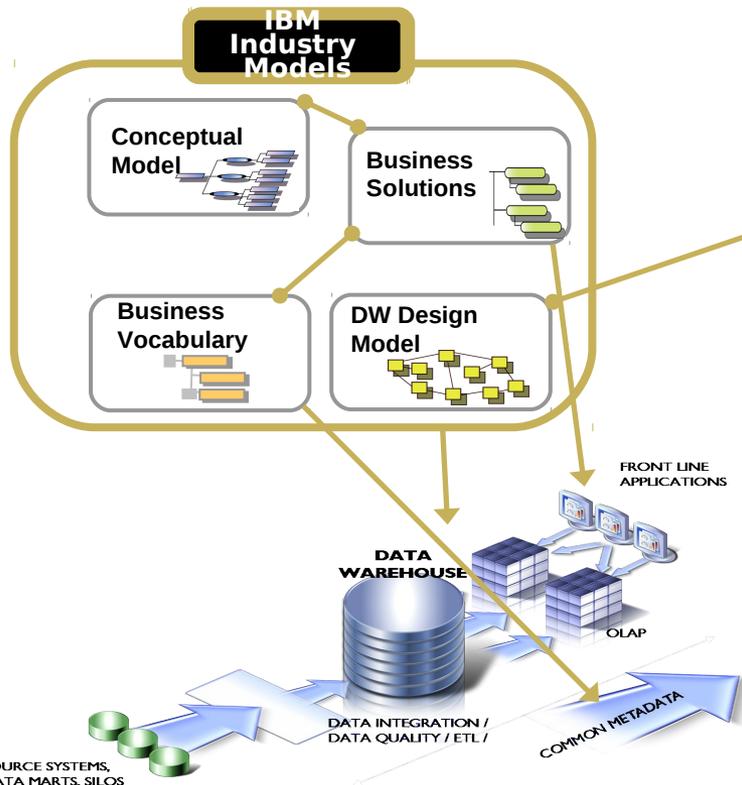
## Step 2 – Create a child project from step 1

- Only selected measures, dimensions, dimension members and related logical design model objects will be created in the child project



# Step 3 – Create a physical data model

- Once the logical design model in step 2 is transformed into a physical model the database can be created using DDL



Logical Design Model



Physical Model

Time Period dimension used as an example during the steps

## Step 4 – Use the data model as a Cognos Data Source

- The Database created and populated in step 3 is the input Data Source in Cognos Framework Manager

New - IBM Cognos 8 BI Query Studio - Mozilla Firefox

http://localhost/cognos8/cgi-bin/cognos.cgi

IBM Cognos Connection

Run Report  
Manage File

BDW Asset and Liability Analysis

CL_VAL_ID	CL_SCM_ID	CL_NM
11	100	2006 Q1
12	100	2006 Q2
13	100	2006 Q3
14	100	2006 Q4
15	100	2006 H1
16	100	2006 H2
17	100	Calendar Year 2006
18	100	2007 Q1
19	100	2007 Q2
20	100	2007 Q3
21	100	2007 Q4
22	100	2007 H1
23	100	2007 H2
24	100	Calendar Year 2007
111	102	Actual
112	102	Forecast
1111	101	Organization
<b>Summary</b>	<b>1,705</b>	



DemoProject - IBM Cognos 8 Framework Manager

Package Definition - DemoPackage

Project Viewer

- NewProject2
  - DEMO
    - Database view
    - Business view
    - Dimensional view
      - Organisation Summary Fact
        - Unit of Measure
        - Involved party
        - Scenario
        - Period Dimension
          - Period
            - Period(All)
              - Year
                - CL\_VAL\_ID
                - CL\_NM
              - Half
              - Quarters

Packages referenced:

Edit

**Populated Database** see Appendix I

**Cognos Framework Manager**

Time Period dimension used as an example during the steps

# Step 5 – Format the Cognos Report

- Report headers are created from measures and dimensions

The screenshot shows the IBM Cognos 8 BI Report Studio interface. On the left, the 'Insertable Objects' pane displays a tree structure for 'BDW Asset and Liability Analysis'. The 'Period' object is circled in red. The main workspace contains a table with the following data:

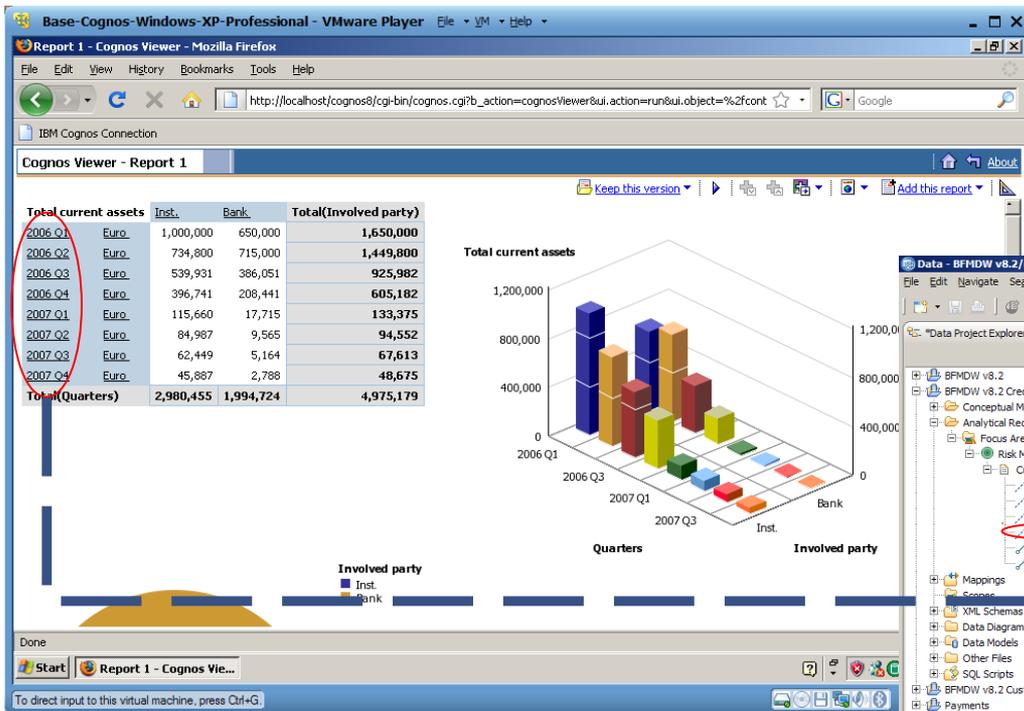
Total current assets	<#Involved party#>	<#Total(Involved party)#>
<#Quarters#>	<#Unit of Measure#>	<#1234#>
	<#Unit of Measure#>	<#1234#>
<#Total(Quarters)#>	<#1234#>	<#1234#>

To the right of the table, a 3D bar chart is displayed. The 'Default measure (z-axis):' is '<Total current assets>'. The 'Categories (x-axis):' is '<#Involved party#>'. Below the chart, the 'Default measure:' is '<Total current assets>' and the 'Series (pie Slices):' is '<#Involved party#>'. The '(Default Legend Title)' is also visible.

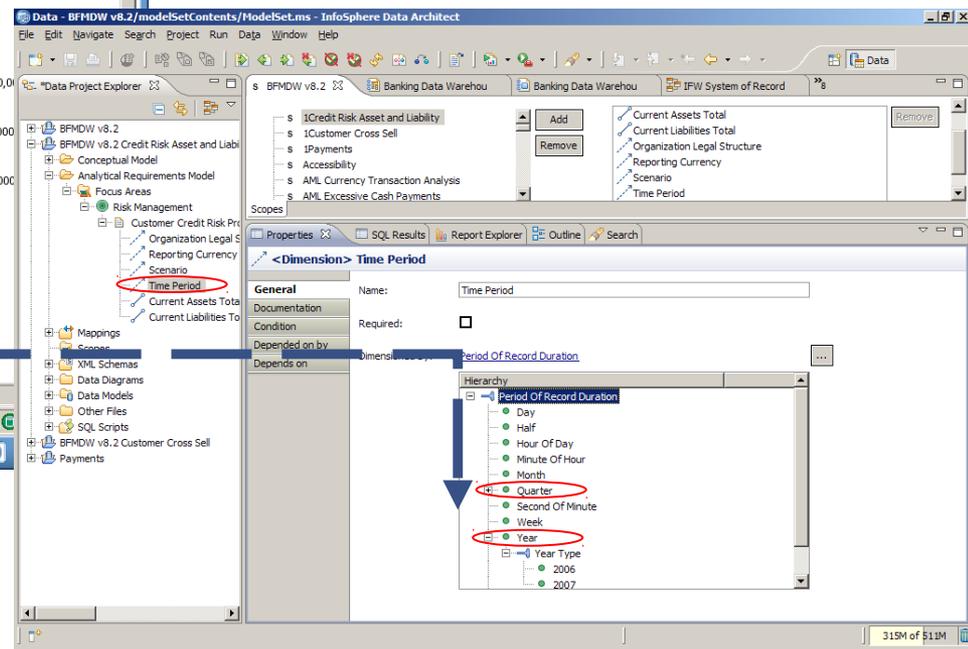
Time Period dimension used as an example during the steps

# End Result - Cognos Report

- Measures, dimensions and dimension members have linkage to previous steps e.g. Time Period Dimension



## Industry Model Child Project Step 1

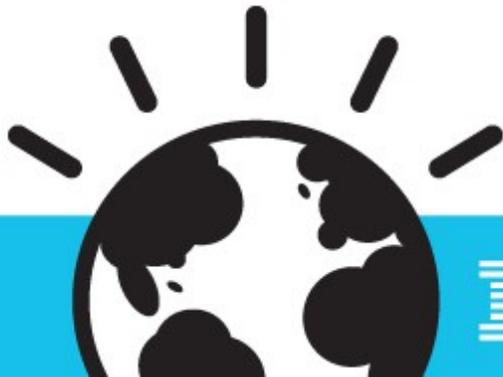


Time Period dimension used as an example during the steps

# Use Case: Telekom Srbije

# Situacija

- > 5 miliona pretplatnika fiksne
- > 5.5#? miliona pretplatnika mobilne
- #?Cdr-ova dnevno
- Preko 15#? izvornih sistema
- Broj potencijalnih korisnika (x1000#?)



# Izazovi i problemi

## Podaci

- Nepovezani sistemi – silosi podataka
- Kvalitet podataka

## Biznis

- Više verzija istine
- Nepostojanje unificiranog rečnika na nivou kompanije
- IT je neophodan posrednik za većinu informacija )

## IT

- Ad-hoc zahtevi IT-u “danas za juče”
- Nepostojanje prave metodologije i modela

## Izveštajni sistem (MIS)

- Tehnološki zastareli alati za izveštavanje (Oracle Forms)
- Nedostaju (metapodaci, GUI, podrška za lako održavanje u kreiranje koda)
- Deo upita se izvršava na transakcionim bazama



# Ciljevi projekta

DWH

- Centralizovano mesto prikupljanja podataka
- Standardizovan model podataka za Telco
- Kategorizacije i klasifikacije u DWH
- Automatizovana integracija sa izvornim sistemima – ETL proces
- Osnov za izveštavanje i naprednu analitiku
- Definisana kroz strategiju razvoja “centralno skladište podataka sa standardizovanim modelom po e-TOM standardu”

BI

- Alati za vizuelnu reprezentaciju
- Različiti analitički nivoi/kanali distribucije informacija korisnicima
- Lako pravljenje novih izveštaja od strane korisnika
- Konsolidacija različitih izvora podataka u istom izveštaju



## Izbor rešenja

DWH

- Standardizovani model
- Iskustvo u telekomunikacionoj industriji
- Predložena arhitektura
- Performantnost, fleksibilnost, lakoća održavanja rešenja
- Poznavanje source sistema kod domaćeg operatera
- Troškovi implementacije
- Primer istiskivanja konkurencije



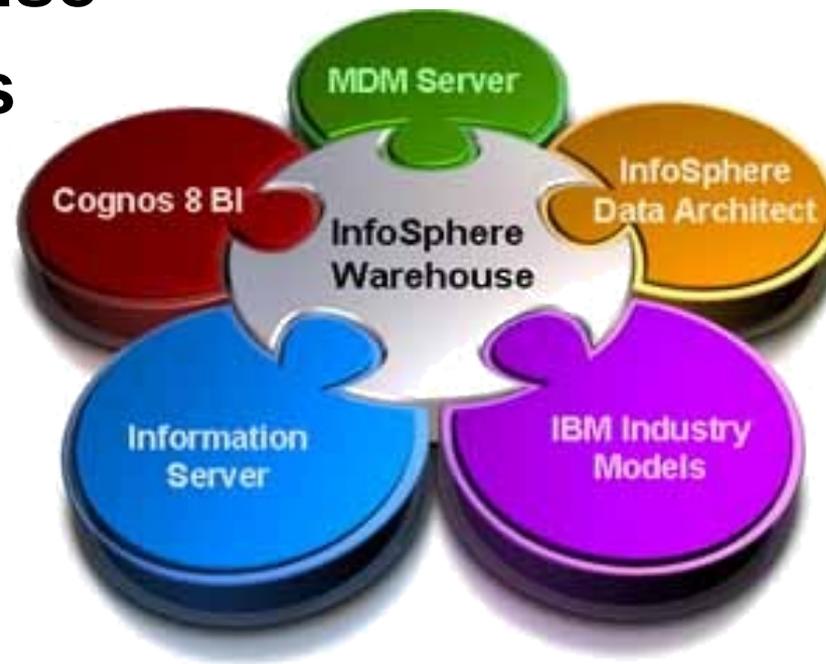
# Tehnologija – IBM Infosphere i Cognos

InfoSphere Information Server

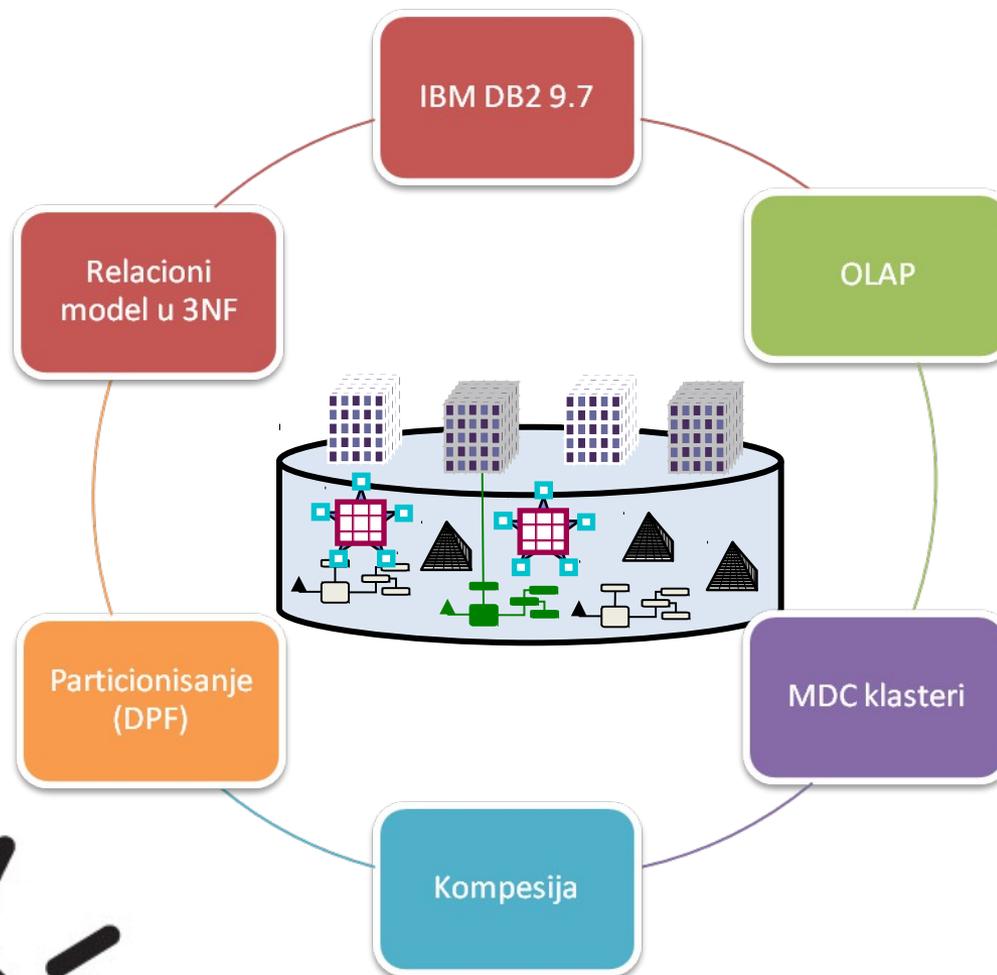
InfoSphere Warehouse

IBM Industry Models

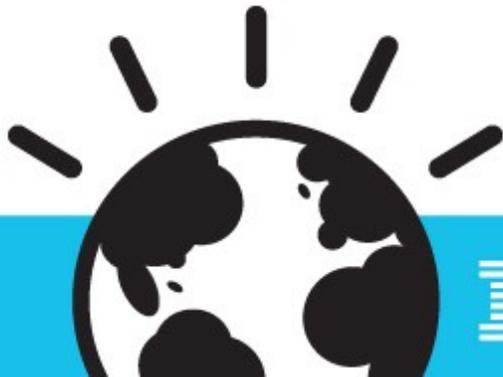
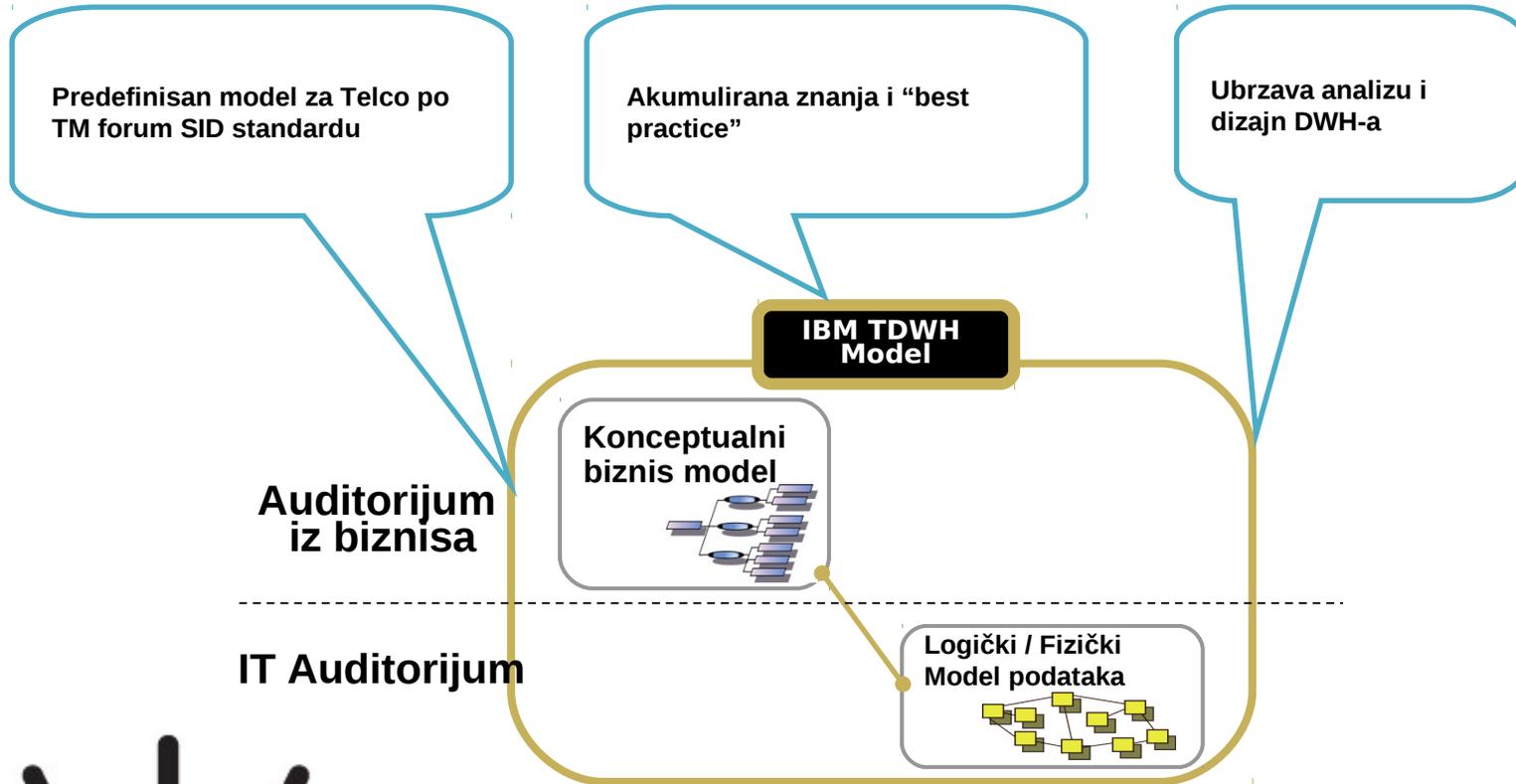
Cognos BI



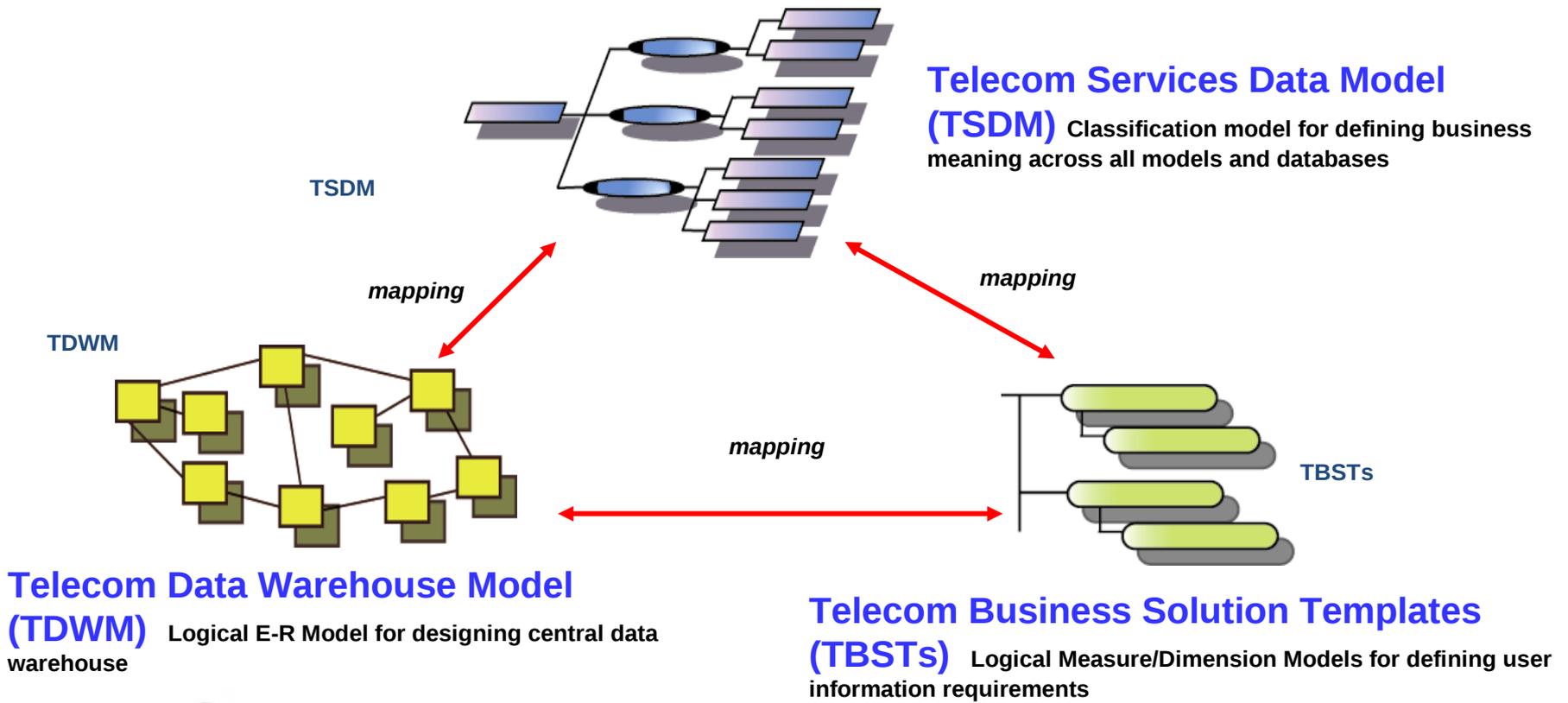
# IBM InfoSphere Warehouse (ISW)



# IBM Telco DWH model (TDWH)



# IBM TDWH komponente



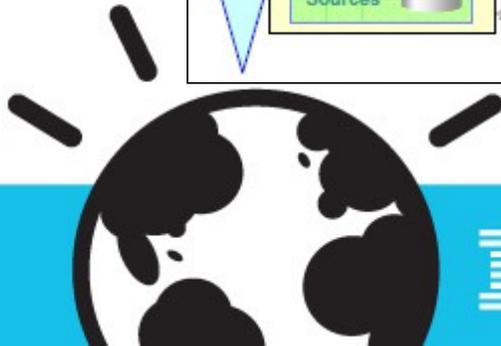
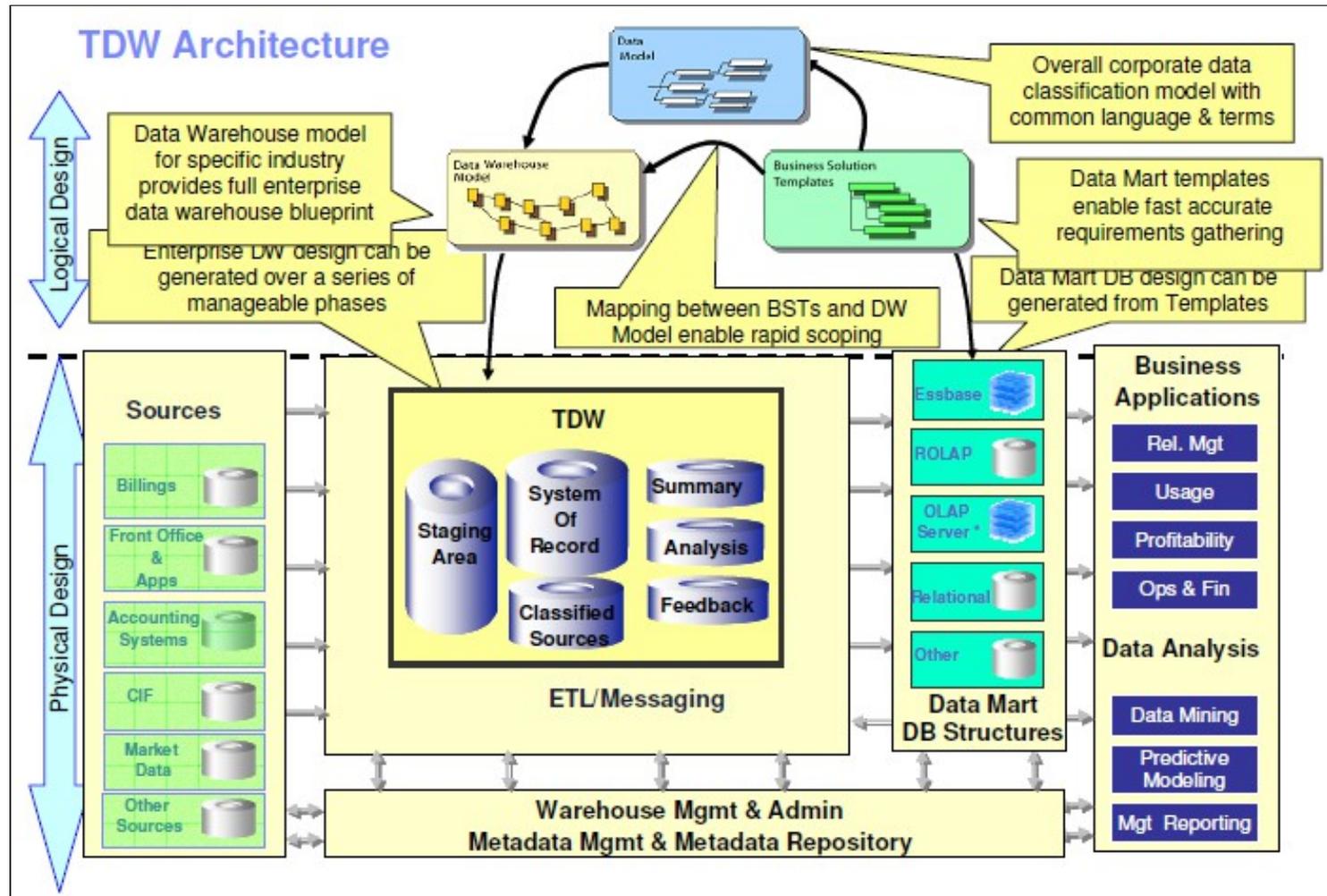
**Telecom Data Warehouse Model (TDWM)** Logical E-R Model for designing central data warehouse

**Telecom Services Data Model (TSDM)** Classification model for defining business meaning across all models and databases

**Telecom Business Solution Templates (TBSTs)** Logical Measure/Dimension Models for defining user information requirements



# Arhitektura Telco DWH-a



## Faze DWH projekta

### *Završena I faza*

– pretplatnici, fakture, servisi i  
rejtirani saobraćaj mobilne i  
fiksne telefonije (14 meseci)

### Realizacija II faze

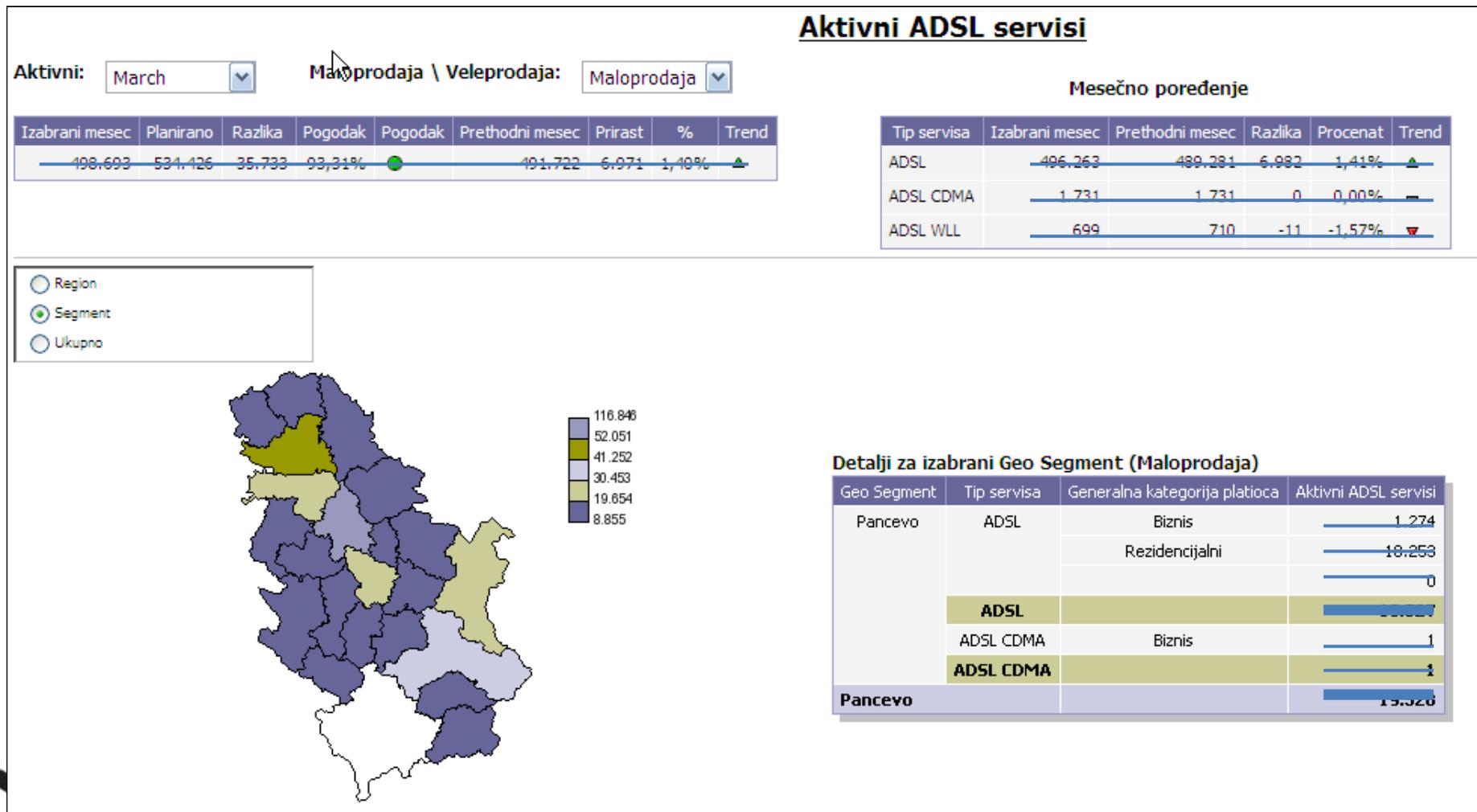
ERP, Trouble ticketing, Call  
centar, Performance  
Management, operativni  
CRM (9 meseci)



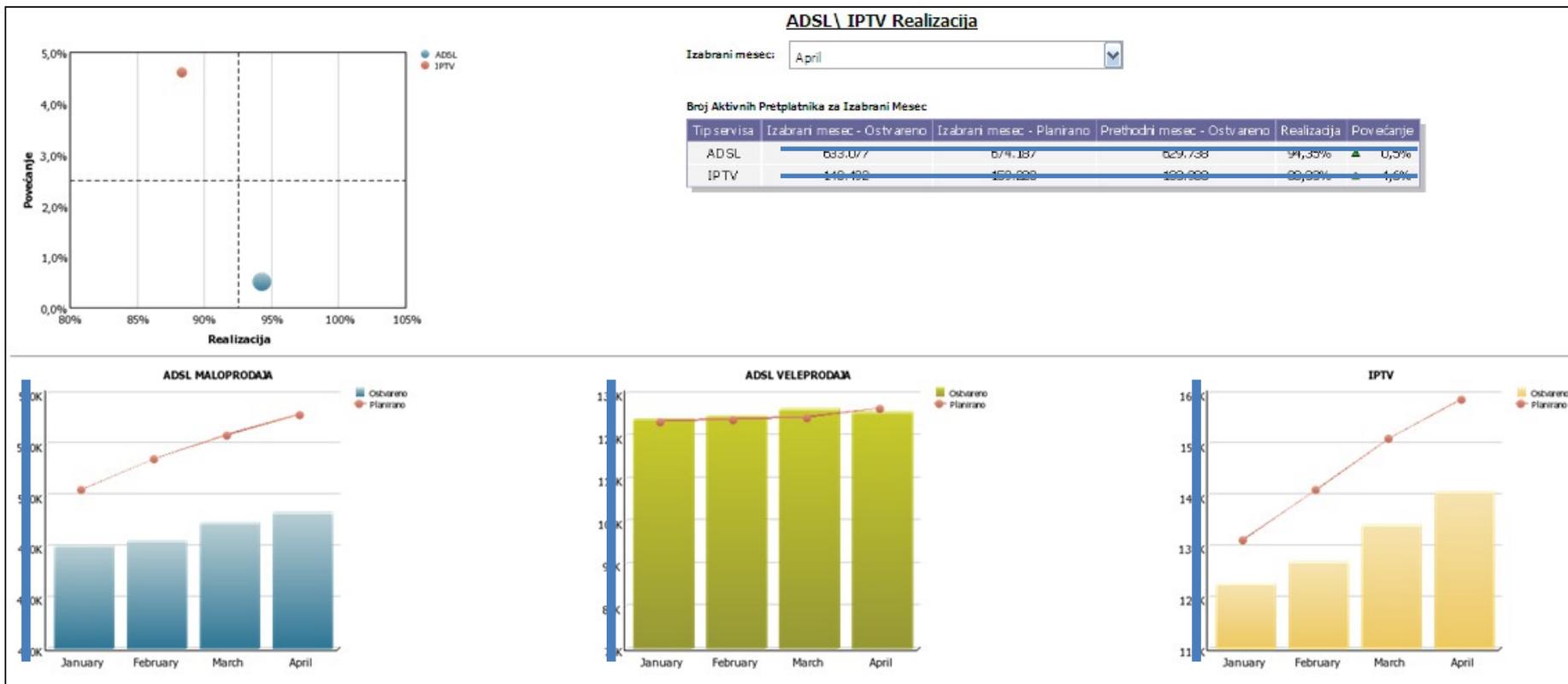
# Benefiti implementacije DWH rešenja



# BI rezultati: KPI po regionima



# BI rezultati: Pretplatnici plan-realizacija

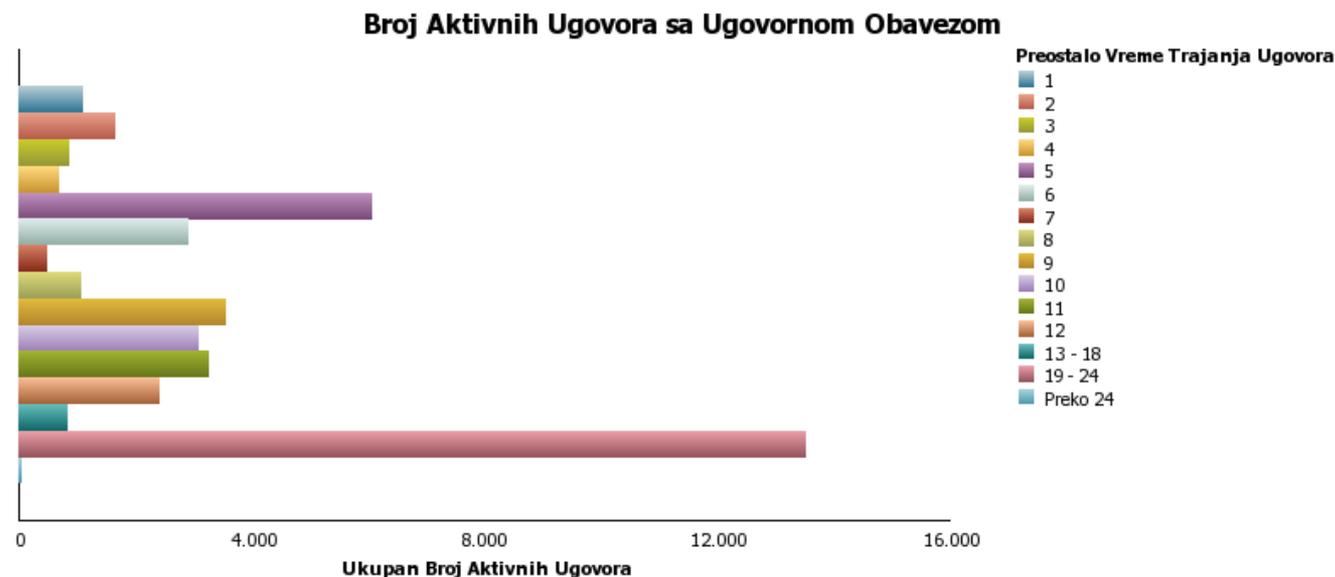


# BI rezultati: Struktura ugovornih obaveza

## Total Active Subsribrs by Remaining Contract Obligation - Monthly

Godina: 2012 Mesec: January

Godina	Mesec	Preostalo Vreme Trajanja Ugovora	Broj Pretplatnika
2012	January	Nema UO	427.969
		Istekla UO	149.347
		1	1.081
		2	1.630
		3	897
		4	665
		5	6.036
		6	2.889
		7	159
		8	1.034
		9	3.525
		10	3.055
		11	3.220
		12	2.370
		13 - 18	818
		19 - 24	13.509
		Preko 24	5
<b>Summary</b>			<b>820.455</b>



# BI rezultati: Saobraćaj plan-realizacija

## Outgoing Traffic - Monthly Overview

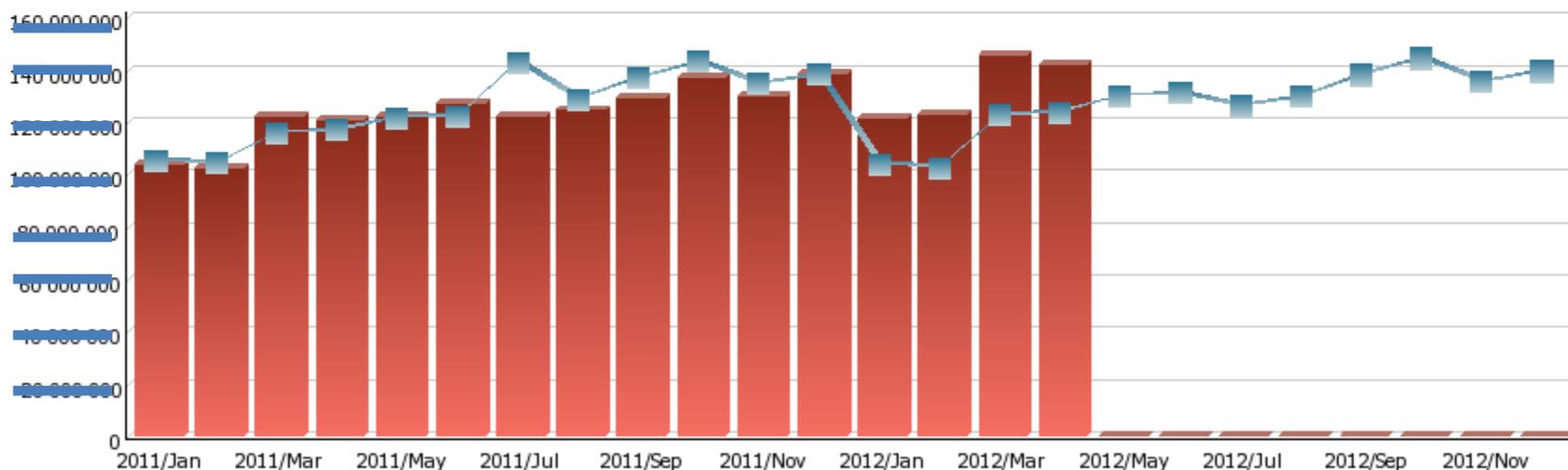
Select Source System:

- Fixed Telephony System
- Postpaid System
- Prepaid System

Select Measure:

- Number of Usage
- Total Rated Usage Amount
- Total Bill Usage Duration (minutes)
- Total Bill Usage Volume (Kb)
- Total Actual Usage Duration (minutes)
- Total Actual Usage Volume (Kb)

### Voice Traffic



# Benefiti implementacije BI rešenja



# Questions ???



Thank  
YOU