



# Denver BIX Enterprise Architecture

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# The challenges continue

- ☀ Things we know, and the business knows...
  - Companies have a large number of interaction points for customers and suppliers, with continuing growth.
  - Customer relationship management is becoming commonplace, but there is little impact across all channels.
  - Data generated and stored by transaction systems continues to grow.
  - Customers continue to become more demanding.
  - Latency, across the supply chain, customer systems, product launch, process control, must be reduced.

# The challenge

- ☀ The usual suspects that scare IT...
  - Real-time integration of multiple applications and data.
  - Real-time integration of intelligence to support intelligent customer interactions, supply chain efficiency, etc.
  - Real-time, real-time, real-time...
  - Support marketing and operations effectively with high-levels of availability and reliability.
  - Minimize ongoing support costs on both a skills and infrastructure basis.

# The traditional approaches

## ☀ Operational Data Stores

- Create a core database to house cross-functional information required by other systems
- Provide a central point for accessing information for the data warehouse

## ☀ Implement messaging systems

- Remove the dependency on proprietary code and utilize guaranteed messaging software such as IBM MQSeries
- Provides robust mechanism for information delivery and parallelism

# The traditional approaches

- ★ We can develop our own code for the integration
  - Utilize the existing organizations skills and experience to build links between the various operational systems
  - Provides a mechanism of self-reliance and knowledge
- ★ We can always use adapters and cartridges to interface to our systems
  - Third-party software interfaces into other third-party software that is usually part of a information delivery system
  - Maintenance and support is outsourced to a third party



# What's wrong with these approaches?

- ✦ Difficult to change or adapt to new channels or business requirements
  - ✦ Modifying existing operational data stores is a time-consuming and cumbersome task.
  - ✦ Most applications implemented are tied to a physical database design, so changes are difficult to implement.
  - ✦ Even assessing the impact of the change requires substantial investigation and time.
- ✦ Scalability can become an issue

# What's wrong with these approaches?

- ✦ Business logic is dispersed throughout various applications
  - Logic is done by various applications using different data and different techniques creating conflicting results
  - Difficult to track and manage for maintenance
- ✦ Most analytics are applied using offline analysis and batch processes, creating latency
  - Call centers may not have the most recent store or web transactions available
  - Account balances can become disparate across systems

# What are the alternatives?

## ☀ Utilize business rule management

- Provides a central place for housing business logic
- Enables re-use and consistency
- Provides for real-time analytics reducing latency and increasing consistency across channels

## ☀ Implement an object management system

- Manages the operational data that needs to be tracked intelligently
- Separates the physical data from the application logic
- Simplifies the use of objects in the business rule management system



# What are the alternatives?

- ★ Leverage messaging systems
  - ★ Integrated messaging provides methods for scaling across hardware
  - ★ Guarantees information delivery with outsourced maintenance
- ★ Plan for scalability across the architecture

# Challenges to implementation

## ☀ Thought and team leadership

- Implementing a scalable, flexible, integrated operational architecture is hard
- Leaders must make sure everything is designed and implemented to fit within the overall architecture
- No shortcuts or band-aids that corrupt the architecture

## ☀ Skills

- Solid architects, application designers, object developers and information architects

# Challenges to implementation

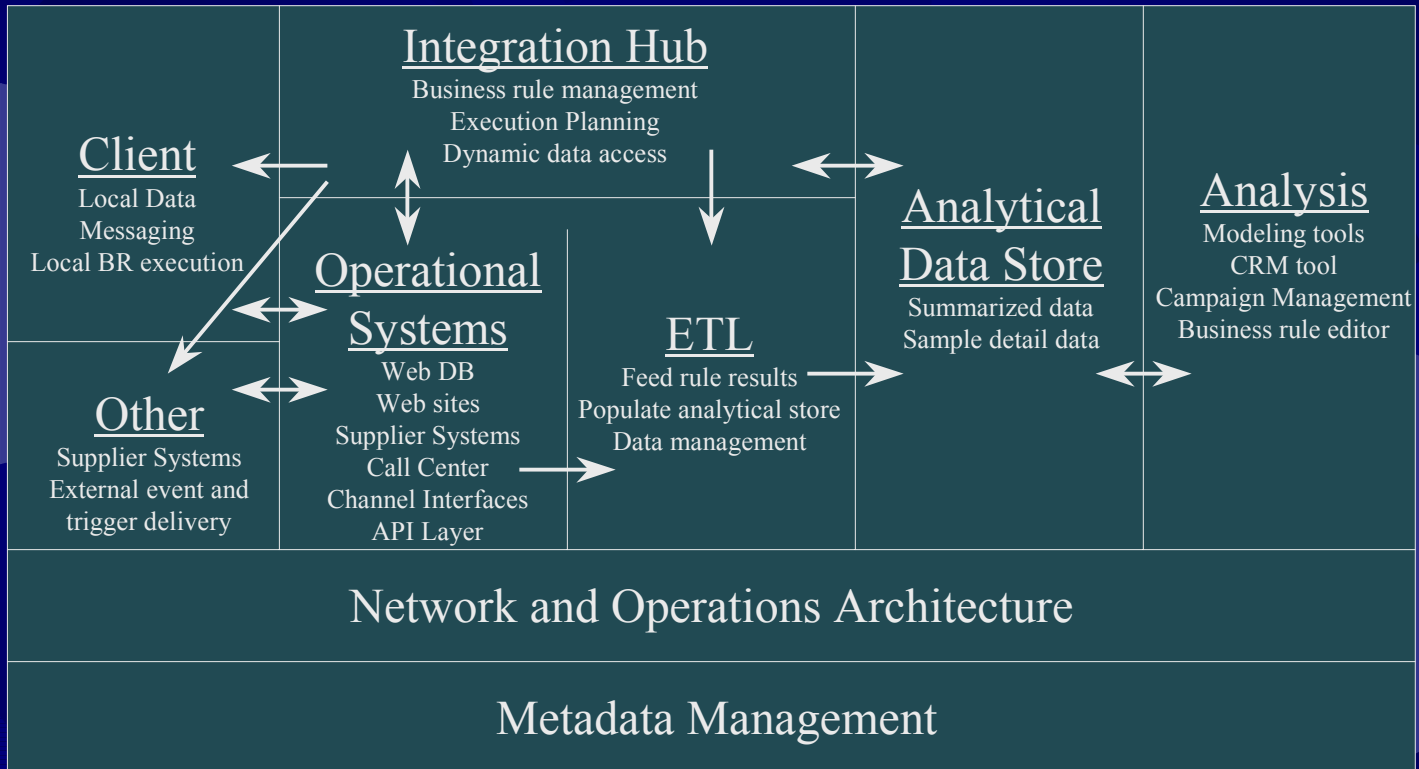
## ☀ Project management

- Same issue as with all IT projects
- Creation and maintenance of a project office, with authority, to manage implementations

## ☀ Architecture planning

- Design, design, design...
- Develop a target architecture that can be effectively communicated
- Put in place formal architecture review processes
- Put the best players on the architecture planning group

# Example architecture diagram





Real-life examples!



# Company background

- ★ First Data decided to enter the credit reporting business
  - Acquired Consumer Credit Associates (CCA)
  - Planned to incorporate various First Data information into credit reports to gain competitive advantage
  - CCA had operational cost competitiveness that could be used to under-price existing players
- ★ System and product flexibility was critical to success of the venture
  - Ability to incorporate complex scoring and other algorithms with maximum reusability
  - Easily integrate with customer systems to simplify implementation

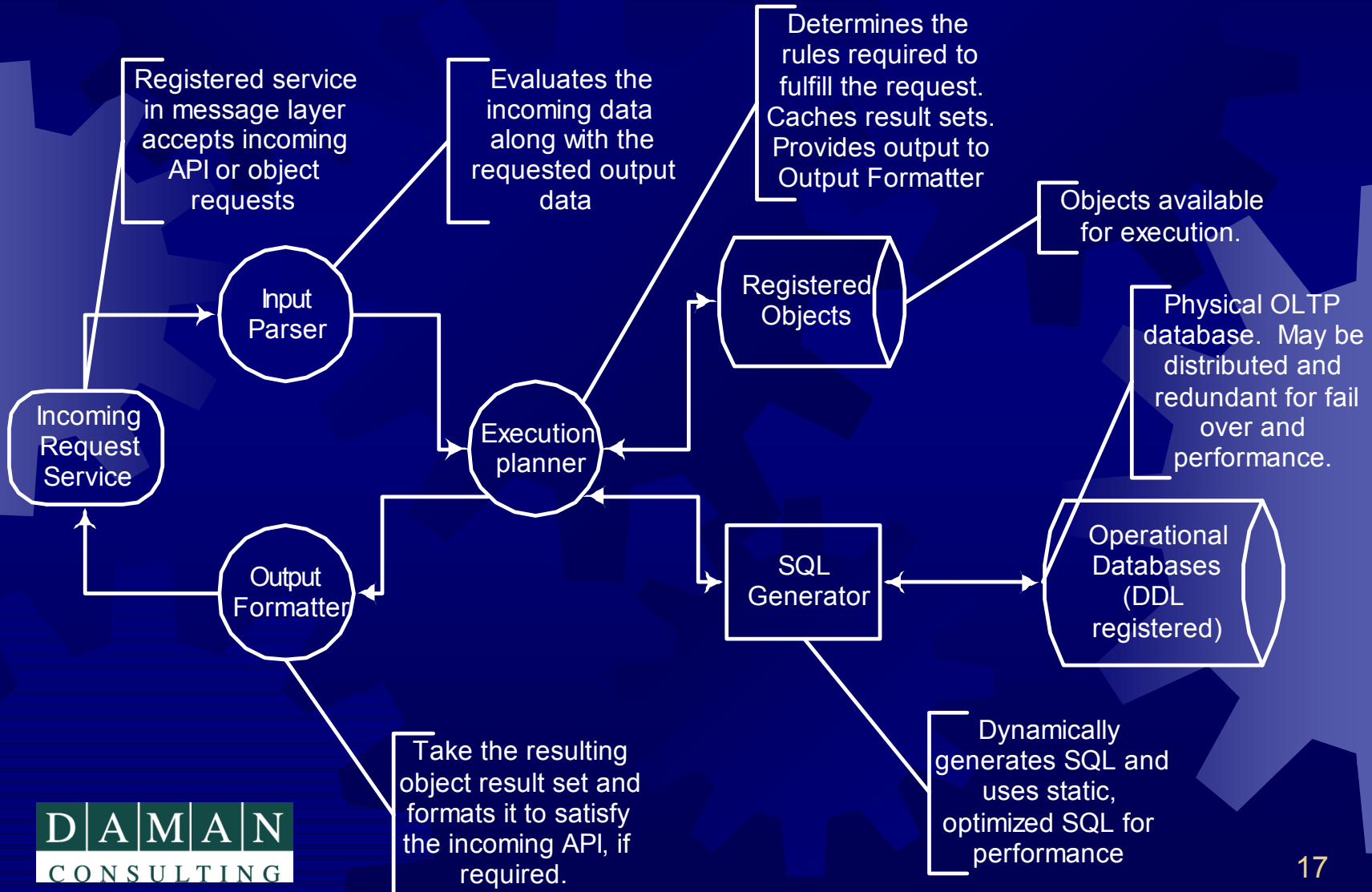
# Critical IT requirements

- ★ Some traditional elements are incorporated
  - Information is provided through a single, operational data store
  - Message is leveraged to provide information delivery, fail-over and parallelism
- ★ Alternative components are integrated
  - Business rule management system houses all the logic (name/address match, scoring, etc.)
  - Object management system provides execution planning for data requests
  - Batch and online processes use the same logic and code
  - Impact analysis is enabled through metadata of the business rule management system

# By the way, it's big...

- ☀ 225 Million consumer records
  - Consumer is considered a particular customer ID based upon address, social security and name
  - Really, probably about 185MM consumers with duplicates
- ☀ 1.9 Billion transaction records
  - Single transaction record is generated for each financial account
  - Update about 1.2 billion every month (updates occur daily)
- ☀ Core system was 7TB
  - Fully mirrored database with 3.5TB allocated
  - Growth drove the database to 11TB, fully mirrored
  - 100 partitions for transaction data, 10 partitions for consumers

# Overview of the system components





# Results?

- ✦ Application system provides data to the customer in whatever format they choose
  - A user-interface could be developed to deploy to customers
  - Key selling point since it eliminates the cost of intermediaries
- ✦ New products are easily introduced
  - Adding public record data to the core product took 10 days from design to release to QA
  - Reuse was easily achieved through the object management system
  - Impact analysis is conducted prior to any implementation
- ✦ System is completely scalable



# Others

- ★ Major chemical company
  - ✿ Decided to integrate information across various supply chain systems
  - ✿ Used an internally developed FTP process
  - ✿ Posts information very effectively at fairly low cost
  - ✿ Cannot cancel an order automatically, requires substantial manual effort

# Others

- ★ Up and coming telecommunications company
  - ✿ Developed separate operational systems to complete calls versus manage customer data (account balance, activation, etc.)
  - ✿ Developed custom messaging system
  - ✿ System's reliability is very poor – lose a customer for every one gained
  - ✿ Customer balance information is out of sync causing 30% of customer service calls

# Summary of key points

- ✦ Integration is becoming more critical to remove latency across the organization
  - Coordination of customer information across channels
  - Reduction in enterprise latency to support product deployment, supply chain effectiveness, etc.
- ✦ Traditional methods of solving these issues need some enhancements
- ✦ Challenges to implementation are serious, but can be overcome by the right planning
- ✦ The results can be significant in removing latency across the entire organization