

Goals of a Data Warehouse

- Make information easily accessible
- Present information consistently
- Adaptive and resilient to change
- Protect information assets
- Foundation to improve decision making
- Business community must accept

A Rich Foundation for Business Intelligence

- ARTS Data Model
 - 10 Business Functions
 - 216 Subject Views
 - 632 Entities
 - 3,755 Attributes
 - 59 Domains
- ARTS XML
 - 15 Sets of standard XML messages
- ARTS Request For Proposals
 - 7 RFP(s)
- ARTS Data Dictionary
 - 27,975 Entries

Logical Progression to BI

- Develop an example of a Data Warehouse
- Data Warehouse Structure and Definitions
 - Derive from the ARTS Data Model (v5.1)
 - Provide mapping from DM to DW
 - Use ARTS Dictionary to cross-reference XML map
- Operational Data Source options
 - Operational ARTS Database
 - ARTS XML messages

Initial Blueprint for BI

- Business Process
 - POS Retail Sales and Returns
- The Grain
 - Sale/Return Line Item
 - Most atomic grain
 - Highly dimensional

Facts

- Sales Quantity
- Gross Sales Amount
- Transaction Price Modification Amount
- Item Price Modification Amount
- Net Sales Amount
- Retail Store Currency Net Sales Amount
- Tax Amount
- Cost of Goods Sold

Dimensions

- Location
 - Describes **where** activity occurs in the Enterprise
- Time
 - Tells **when** activity occurs
- Customer
 - Identifies **who** is purchasing goods and services
- Item
 - Names, describes, classifies **what** is being sold

DW_ITEM

ItemID: CHAR(32); Identity/UID (FK)

ItemIDQualifier: INTEGER; Identity
ItemID: VARCHAR(14); Identity/ID
Name: VARCHAR(40); Name
Description: VARCHAR(255); Description/Short
LongDescription: VARCHAR; Description/Narrative
TypeCode: CHAR(4); Code4
TaxExemptCode: CHAR(2); Code2
SubFamilyID: INTEGER; Identity
SubCode: CHAR(8); Code8
StyleCode: CHAR(4); Code4
KitSetCode: CHAR(2); Code2
ColorCode: CHAR(4); Code4
UnitOfMeasureCode: CHAR(2); Code2
StockItemTypesCode: CHAR(2); Code2
SalesWeightOrUnitCountCode: CHAR(2); Code2
UnitPriceFactor: DECIMAL(9,2); Quantity
AvailableForSaleDate: TIMESTAMP; Date/Calendar
EnvironmentTypesCode: CHAR(2); Code2
SecurityRequiredTypesCode: CHAR(2); Code2
HazardousMaterialTypesCode: CHAR(2); Code2
InventoryAccountingMethodCode: CHAR(2); Code2
BrandName: VARCHAR(40); Name (FK)
RespOnableDayOrID: INTEGER; Identity
ShrinkRateAsOfFlag: SMALLINT; Flag
ShrinkRateAsOfFlag: SMALLINT; Flag
AssortmentFlag: SMALLINT; Flag
AssortmentDescription: VARCHAR(255); Description/Short
SegmentName: VARCHAR(40); Name
SegmentID: INTEGER; Identity
FamilyName: VARCHAR(40); Name
FamilyID: INTEGER; Identity
ClassName: VARCHAR(40); Name
ClassID: INTEGER; Identity
CommodityName: VARCHAR(40); Name
CommodityID: INTEGER; Identity

DW_TIME

BusinessDayDate: CHAR(70); Date/ISO8601 (FK)

CalendarYear: TIMESTAMP; Date/Year
CalendarQuarter: CHAR(1); Date/FiscalQuarter
CalendarMonth: CHAR(2); Date/CalendarMonth
CalendarWeek: CHAR(2); Date/FiscalWeek
CalendarDay: CHAR(2); Date/CalendarDay
CalendarWeekDay: CHAR(1); Date/CalendarDay
ISOCalendarWeek: CHAR(2); Date/FiscalWeek
FiscalYear: CHAR(4); Date/CalendarYear
FiscalQuarter: CHAR(1); Date/FiscalQuarter
FiscalMonth: CHAR(2); Date/FiscalMonth
FiscalWeek: CHAR(2); Date/FiscalWeek
FiscalDay: CHAR(1); Date/FiscalDay
FiscalWeekBeginningDayFlag: CHAR(1); Date/FiscalDay
MerchandisingYear: TIMESTAMP; Date/Year
MerchandisingSeason: VARCHAR(255); Description/Short
MerchandisingMonth: CHAR(2); Date/FiscalMonth
MerchandisingWeek: CHAR(2); Date/FiscalWeek
MerchandisingDay: CHAR(1); Date/FiscalDay
HolidayFlag: SMALLINT; Flag
SpecialEventFlag: SMALLINT; Flag
AdvertisingYear: CHAR(4); Date/CalendarYear
AdvertisingSeason: VARCHAR(255); Description/Short
AdvertisingMonth: CHAR(2); Date/FiscalMonth
AdvertisingWeek: CHAR(2); Date/FiscalWeek
AdvertisingDay: CHAR(1); Date/FiscalDay

DW_SALES/RETURN TRANSACTION

TransactionID: CHAR(32); Identity/UID
RetailTransactionID: INTEGER; Sequence/Number
RetailStoreLocalCurrencyID: INTEGER; Identity (FK)
ExchangeRate: FLOAT; Surrogate
EndDateTimestamp: TIMESTAMP; TimeStamp/Expiration
SalesQuantity: DECIMAL(9,2); Quantity
GrossSalesAmount: DECIMAL(14,3); Money
TransactionPriceModificationAmount: DECIMAL(14,3); Money
ItemPriceModificationAmount: DECIMAL(14,3); Money
NetSalesAmount: DECIMAL(14,3); Money
RetailStoreCurrencyNetSalesAmount: DECIMAL(14,3); Money
TaxAmount: DECIMAL(14,3); Money
CostOfGoodsSoldAmount: DECIMAL(14,3); Money
GrossMarginAmount: DECIMAL(14,3); Money

DW_RETAIL STORE LOC

RetailStoreID: CHAR(32); Identity/UID (FK)

AddressLine1: VARCHAR(40); Address
AddressLine2: VARCHAR(40); Address
AddressLine3: VARCHAR(40); Address
AddressLine4: VARCHAR(40); Address
City: VARCHAR(30); City
Territory: CHAR(2); State
PostalCode: VARCHAR(15); PostalCode
PostalCodeExtension: CHAR(4); Code4
ILCountryCode: CHAR(3); Phone/Number/CountryCode
Latitude: TEXT(7); Latitude; ISO6709
Longitude: TEXT(8); Longitude; ISO6709
OpenDate: TIMESTAMP; Date/Calendar
ClosingDate: TIMESTAMP; Date/Calendar
SellingAreaSize: DECIMAL(9,2); Quantity
Size: DECIMAL(9,2); Quantity
AreaSizeUnitOfMeasureCode: CHAR(2); Code2 (FK)
LastModifiedDate: TIMESTAMP; Date/Calendar
EmailAddress: VARCHAR(64); Email/Address
CompletionNumber: VARCHAR(32); Phone/Number/Completion
MarketRegionName: VARCHAR(40); Name
MarketRegionID: INTEGER; Identity
MarketAreaName: VARCHAR(40); Name
MarketAreaID: INTEGER; Identity
DistrictName: VARCHAR(40); Name
DistrictID: INTEGER; Identity
StoreGroupName: VARCHAR(40); Name
StoreGroupID: INTEGER; Identity

DW_CUSTOMER

CustomerID: INTEGER; Identity (FK)

CustomerAccountID: INTEGER; Identity (FK)
LastName: VARCHAR(40); Name
LastNameType: CHAR(2); Code2
FirstName: VARCHAR(40); Name
FirstNameType: CHAR(2); Code2
MiddleName: VARCHAR(40); Name
MiddleNameType: CHAR(2); Code2
SortingName: VARCHAR(40); Name
MailingName: VARCHAR(40); Name
OfficialName: VARCHAR(40); Name
Salutation: VARCHAR(40); Name
Suffix: VARCHAR(40); Name
AddressLine1: VARCHAR(40); Address
AddressLine2: VARCHAR(40); Address
AddressLine3: VARCHAR(40); Address
AddressLine4: VARCHAR(40); Address
City: VARCHAR(30); City
Territory: CHAR(2); State
PostalCode: VARCHAR(15); PostalCode
PostalCodeExtension: CHAR(4); Code4
AreaCode: CHAR(3); Phone/Number/AreaCode
TelephoneNumber: VARCHAR(20); Phone/Number/Local
ExtensionNumber: CHAR(3); Phone/Number/Extension
EmailAddress: VARCHAR(64); Email/Address
GenderType: CHAR(2); Code2
BirthDate: TIMESTAMP; Date/Calendar
HighestEducationLevelName: VARCHAR(40); Name
LifecycleType: VARCHAR(40); Name
AnnualIncomeAmount: DECIMAL(14,3); Money
MaritalStatusCode: CHAR(2); Code2/Status
ReligiousAffiliationName: VARCHAR(40); Name



Sales View

- Sales by Time Dimension
- Sales by Location Dimension
- Sales by Item Dimension
- Period Sales Crosstab
- Location Sales Crosstab

Merchandising View

- Fast Selling Item Analysis
- Slow Selling Item Analysis
- Vendor Sales Performance Analysis
- Category Performance Analysis
- Item Sales by Geographic Location
- Basic Item Affinity Sales Analysis
- Item Sales over Time

Additional Business Views

- Inventory Control
- Order Management
- Workforce Management
- Customer Relationship Management

Sample Key Performance Indicators

- Prior Period over Current Period Sales
- Sales per Unit Area
- Top Selling Items
- Bottom Selling Items

ARTS Illustrated Sales per Square Ft KPI

Sales Period: 01-01-2007 - 12-31-2007

Store	Area		Sales	Sales/SqFt	Std Dev	Alert
100	23,000		\$ 2,340,000	\$ 101.74	2.544	↑
101	24,500		\$ 1,590,000	\$ 64.90	0.426	↔
102	30,000		\$ 1,560,000	\$ 52.00	(0.316)	↔
103	32,000		\$ 1,534,000	\$ 47.94	(0.550)	↓
104	25,000		\$ 1,226,056	\$ 49.04	(0.486)	↔
105	26,000		\$ 1,351,636	\$ 51.99	(0.317)	↔
106	35,000		\$ 1,794,000	\$ 51.26	(0.359)	↔
107	36,000		\$ 1,860,716	\$ 51.69	(0.334)	↔
108	35,500		\$ 1,666,028	\$ 46.93	(0.608)	↓
All Stores	267,000		\$ 14,922,436	\$ 55.89	(0.092)	↔

Aggregate	Average SlS/Sq Ft	\$ 57.50
Metrics:	Std Dev	17.392334
	Median SlS/Sq Ft	\$ 51.69

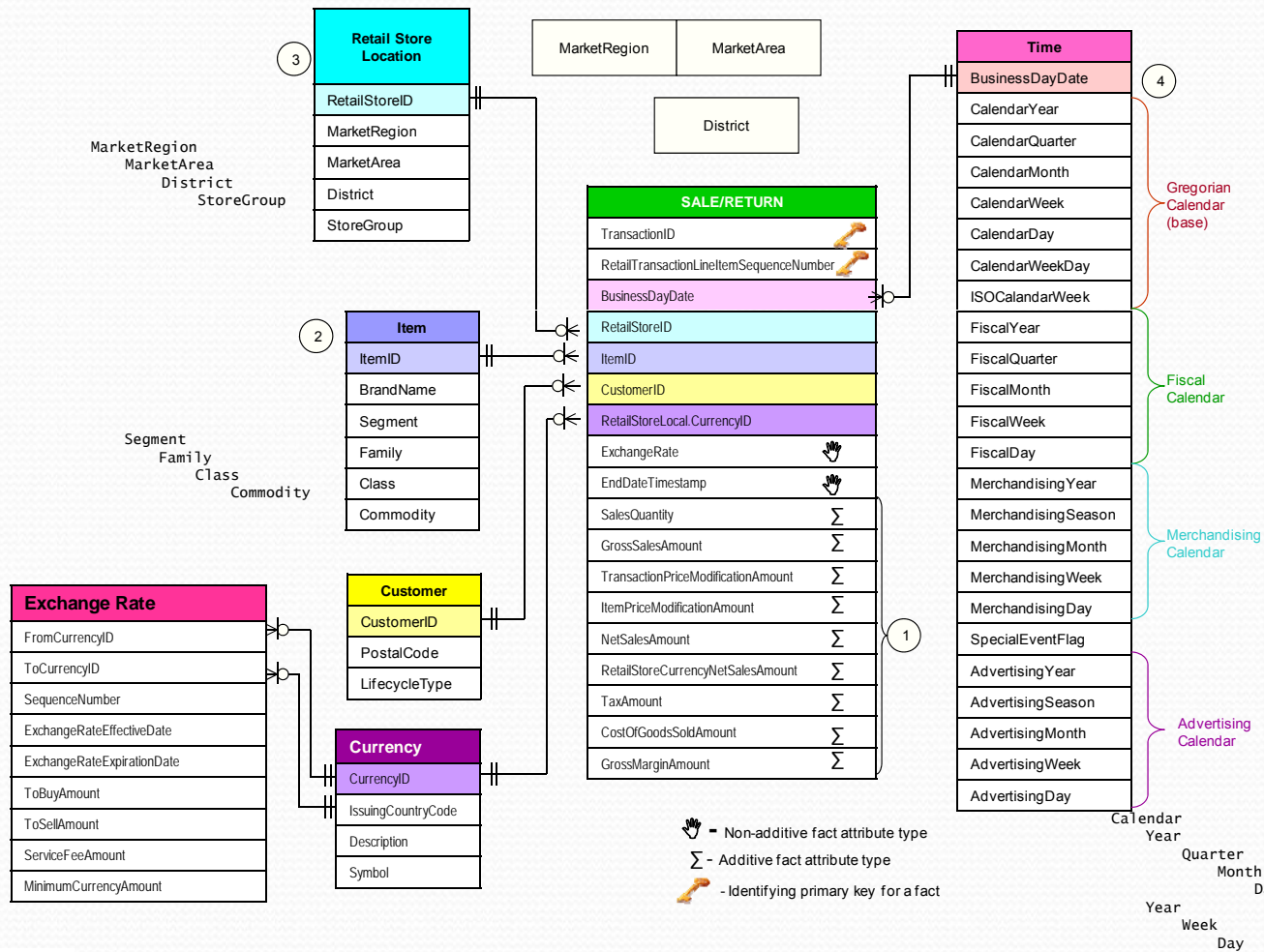
The ARTS Data Warehouse Model

- Inaugural release early 2008
- Over 100 pages to start
- Incorporate feedback from ARTS members
- Expand and improve through a formal release strategy



Adobe Acrobat
Document

From DW-model

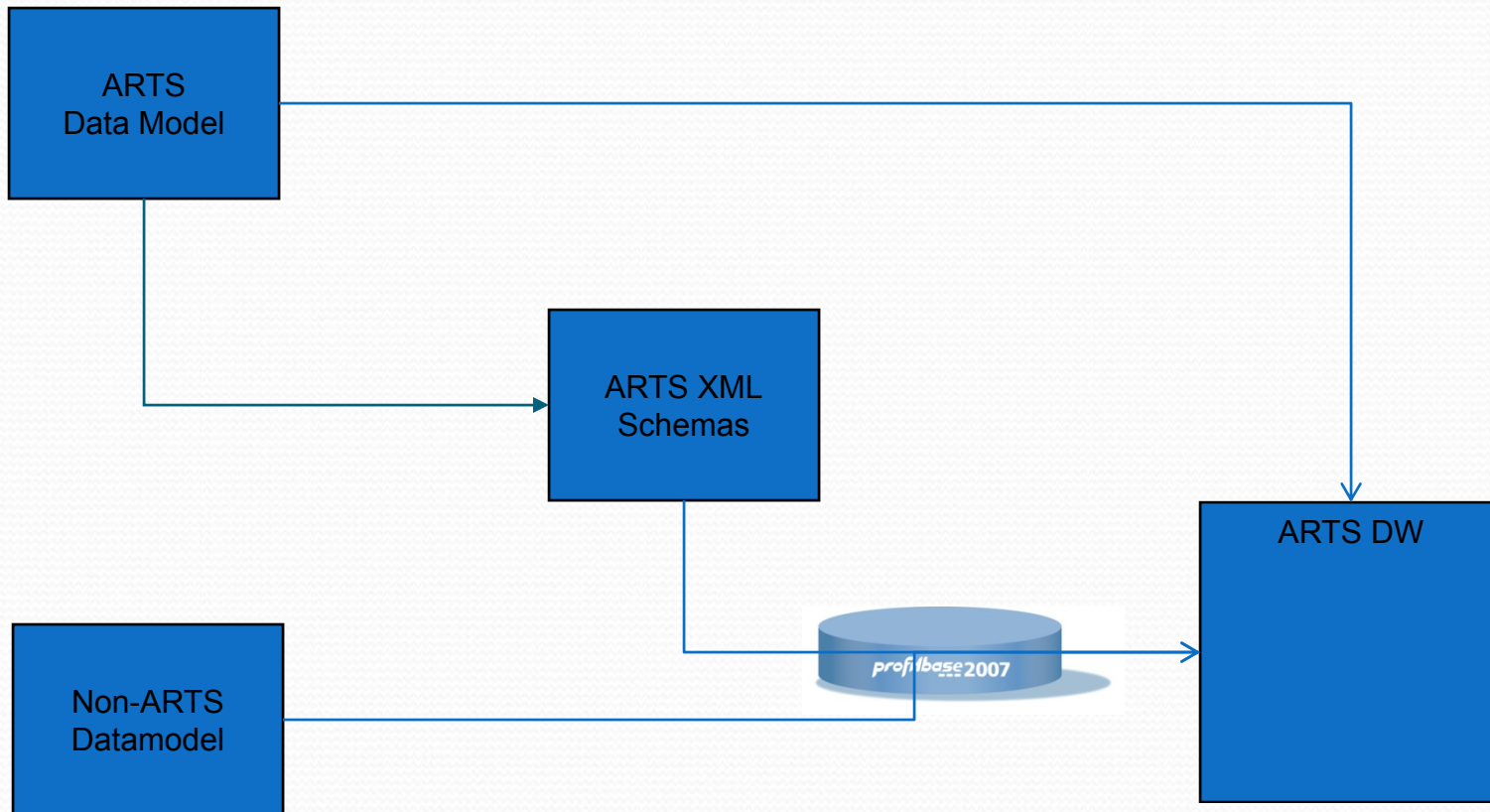


Tracing ARTS Data Model to Web Services

Relational World

XML Schema

Data Warehouse



ProfitBase aligned with ARTS DW

- Demo

Summary

Summary

- **Unconstrained change or flexibility is undesirable** - creating duplication, inconsistency, complexity and cost
- **Standardisation is typically a function of industry maturity** - railway gauges, clothing sizes, building industry guidelines
- **Requirement for blend** of standard, and custom functionality
- **Flexibility comes from:**
 - **reduction in effort** through reuse of standard services and components
 - **governance over architectural integrity maintaining core SOA characteristics** of loose coupling, standardisation, modularity, abstraction and differentiation

Thank You

Extend and invitation to come and talk

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