



Operational Data Model Version 7.0 Executive Summary

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1 Introduction

This executive summary describes the new version 7.0 of the ARTS Operational Data Model. ARTS' original retail store data model was released in 1996. This newest version reflects 18 years of continuous expansion and improvement. It is the most comprehensive retail-specific data model offered anywhere. It is used throughout the world by retailers and retail software solution firms to advance application interoperability, reduce the cost of integration, provide a retail-based information scheme and provides a foundation for future innovation and expansion of retail information solutions.

The objective of Version 7.0 is to help Retailers analyze customer behavior and actions in order to understand the contribution different customer groups make to the profitability of the business as a whole. The challenge is turning this analysis into actionable information that can support a retailer's business strategy.

This release helps retailers identify who their most profitable customers are, how to acquire more of them and how to cultivate relationships with these customers that will maximize their value to the business. Version 7.0 provides support to track and analyze customer demographic, psychographic, and geographic information, as well as special interests and activities. This applies to individuals as well as to organizations.

The ARTS Operational Data Model is part of a comprehensive suite of Data Management products. For more detail about the ARTS Data Management offerings see the retail standards section of the NRF web site.

2 Data Subcommittee Roster

This document is a product of the ARTS Data Subcommittee

Chairperson:

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Andy Mattice	AccessVia
Marianne Gregory	Alvarez & Marsal
Christo Smit	Argility
Allison Troop	Beall's Department Stores
Kirstin Wright	Cumulus Data Services
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Angela Seidel	GK Software AG
Vere Miller	Mettler-Toledo International
Lawrence Dunn	PCMS
Tom Sterling	ARTS
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3 What's New in Version 7.0

This topic introduces new subject areas and data model work products.

3.1 Consumer Life Cycle Journey

ARTS is introducing explicit support for retail life cycles into the data model beginning with the Consumer-Customer Journey. This design allows future work efforts to create additional life cycles with new retail information models.

3.2 Extended Customer Master Data

The treatment of Customers and Parties has been greatly expanded in ARTS ODM V7.0. Many of the new entities used to describe customers and customer characteristics are linked to Person and Organization which are the predominant ARTS Party subtypes. A large number of attributes describing customer demographics, psychographics, geographic information, areas of interest, and health condition are now available to describe individual consumers. A similar number of attributes such as legal organization type, industry classification codes, business size, employee counts and others are available to describe organizations. These characteristics help retailers segment and classify their customers independent of their behavior.

3.3 Consumer Behavioral Data

The extensions added to Customer in ARTS ODM V7.0 address consumer and customer behavior. The retail transaction continues to serve as the primary source for distilling customer behavior. These behaviors provide a feedback loop that enables retailers to evaluate and improve their strategy.

3.4 New Reference Subject Areas

ARTS ODM 7.0 incorporates several new reference subject areas. These new reference subject areas are:

- Weather
- Currency
- Geolocation
- Channels

These subject areas enhance the contextual information available for ARTS core fact entities. Weather, for example, allows retailers to look at merchandise in terms of the kinds of weather conditions it is designed to accommodate. Weather also applies to retail transactions as one additional factor that influences sales. The Channels subject area enhances ARTS description of the touch points and media used to interact with consumers and customers. The Geolocation subject area introduces census and other geographic hierarchy schemes for decomposing market areas. It is a flexible, open ended design that enables retailers to use national census and other location reference schemes for decomposing geography and attach demographic, socioeconomic and environmental dimensional data useful for understanding consumers and markets.

3.5 New Technical Deliverables

With ARTS ODM 7.0, a complete full physical data model and data definition language (DDL) is being provided. The DDL is generated from the ARTS Data Model. In addition to the DDL ARTS is also providing a generated SQL compliant ARTS sample database. This database, when used in conjunction with the ARTS Data Warehouse Model provides a mechanism to populate the data warehouse to determine the effectiveness of the retailer's business strategy. This direct connection provides a seamless connection between front-line business applications and back end decision support tools.

4 Data Model Content

4.1 Data Model Presentation

4.1.1 Narrative

The narrative content provides background and explanatory information about the ARTS Operational Data Model. It is organized into retail business themes and subject areas. The topics are viewable in the left side of the web page. Each retail theme and associated subject areas are defined and described in the narrative.

4.1.2 Logical Data Model

The logical data model is presented as a set of subject area entity relationship diagrams and metadata for each entity in a subject area. The entity diagrams are presented with their attributes in a large format to make them readable. Each entity has a link to metadata that defines key properties of the entity itself and all of its attributes. Meta data presents both logical and physical properties for each entity and attribute.

4.1.3 Physical Data Model

The physical data model (in terms of names, data types, null options) is reflected in the entity metadata described under Logical Data Model. Physical properties for each entity include table name, column name, column data type, column usage (owned attribute, foreign key, primary key, alternate key, etc.), null options etc.

4.1.4 Generated SQL Data Definition

The ERWIN physical database model is used to generate SQL Server 2012 DDL that users may run to create an ARTS ODM 7.0 database.

4.2 Version History

The data model has been continuously improved since its initial release in 1996. The changes (in chronological order) include:

Version 1.0

- Original Release August 1997:
 - ❖ This release established the store operations portion of the model;

Version 2.0

- August 1999:
 - ❖ Added Customer Relationship Management to the model.
 - ❖ Included another document called INTEGRATED BUSINESS VIEW, DATA MODEL, VERSION 2.0. Much of the content of that document overlapped with this document. The contents of the integrated business view document has now been incorporated into this document;

Version 3.0

- March 2001
 - ❖ Added the Forecourt subject area
 - ❖ Price derivations and taxation structures of the model underwent significant overhaul;

Version 4.0

- March 2003
 - ❖ Introduced the entity **StoreGroup** (subsequently replaced with **BusinessUnitGroup**) which allows the model to expand from its traditionally store-centric view to an enterprise-centric view;

Version 5.0 and 5.1 Maintenance

- March 2005
- Expanded the model into enterprise business functions, as well as:
 - ❖ The separation of Item Inventory (which records what stock is kept where) from the Stock Ledger Account (which records how much stock the retail enterprise owns);

- ❖ Inclusion of entities required to support Customer Order management;
- ❖ An update of POSLog structures to match ARTS XML Schema POSLog v2.1; and
- ❖ Inclusion of Worker management structures to match ARTS XML Schema Worker v1.0.
- 2007 Maintenance Release Version 5.1
 - ❖ Interim maintenance release, incorporated a number of technical corrections and improvements to the 5.0 version.

Version 6.0

- March 2009
 - ❖ Transaction Taxes: Enhanced support for transaction taxes, addressing a wider variety of retail transaction taxes, levies, and fees. These enhancements provide greater support for the flexible configuration of taxes, tax rules, tax authorities and jurisdictions;
 - ❖ Tax Registrations and Certificates: Enhanced support for the recording of tax registrations and certificates;
 - ❖ Person data: Enhanced support for internationalization and localization of personal data, plus added ability to track a variety of birth date information;
 - ❖ Commissions: Enhanced support for Commission Plans;
 - ❖ Price Modifications: Ability to increase and decrease the price of an item via a promotion or price adjustment;
 - ❖ Merchandise Group / Buyers: Ability to support multiple buyer responsibilities for merchandise groups;
 - ❖ Till Assignments: Separated till accountabilities from workstation assignments;
 - ❖ Shipment tracking: Greater support for estimated and actual shipping information;
 - ❖ Customer Verification: Expanded support for newer techniques of customer verification during tender;
 - ❖ Device Events: Added the ability to capture device events such as printer out of paper, offline, etc.;
 - ❖ Manual Discounts and Price Modifications: Added the ability to support manual price modifications at the retail transaction line level;

- ❖ Geo Coordinates: Expanded ability to support multiple geo-coordinate systems and map coordinates to physical addresses (GeoCoding);
- ❖ Loyalty Programs: Enhanced support for newer loyalty reward card types and expanded loyalty award tracking;
- ❖ International Currency: Extended money-related attributes to better support international currency requirements; and
- ❖ Gift Certificates: Enhanced support for new media types of gift certificates, plus extended tracking of balance amounts.

Version 6.1

- January 2011
 - ❖ Introduces support for Fresh Item Management and related business functions requiring item retail selling unit traceability;
 - ❖ Improves support for sales restriction validation processing by moving question and answer to retail transaction level while retaining the invocation of sales restrictions at the item level;
 - ❖ Extended Forecourt History View by adding a **PumpTest** entity type and attributes to record retailer and regulatory testing and calibration of fluid metering subsystems; and
 - ❖ Implemented a number of technical corrections and upgrades to version 6.0.

Version 7.0

- March 2014
 - ❖ Adds a comprehensive set of entities to describe customer demographic, psychographic, geographic and special interests and activities - this applies to individual consumers as well as to organization consumers;
 - ❖ Adds entity types to classify and analyze customer behavior which applies to known, identifiable customers as well as anonymous customers;
 - ❖ Adds a subject area and entities to support consumer-customer lifetime tracking and analysis using a state-transition representation of the consumer's journey. This set of entities facilitates creating and capturing retailer defined consumer conversion states and events. In this release it explicitly links conversion events to channels, business units, locations and retail transactions;
 - ❖ Adds new customer contact entities for web sites and social media;

- ❖ Extends the treatment of channel beyond a single attribute to encompass touch points, communication type media type and links it to transactions, consumer-conversion events and customer orders;
- ❖ Adds explicit support for Households and allows retailers the option to track consumer-customer activity by household as well as by individual;
- ❖ Adds new weather entities and attributes to help in classifying consumers, geographic areas and item categories. Also weather is tied explicitly to retail transactions to extend ARTS customer analytic support;
- ❖ Revises the way **Party** is sub-typed. Customers, suppliers, tax authorities and all of the different kinds of individuals and organizations retailers interact with are now treated as subtypes of **PartyRoleAssignment** which is an important correction to the earlier data model versions;
- ❖ Adds a sample entity to support wallet share analysis of customer purchases;
- ❖ Establishes the customer context for further extension of the ARTS Operational Data Model into promotion management, customer loyalty program, customer interaction, social networking and other aspects of consumer-retailer interaction;
- ❖ Expansion of data model work products to include fully generated data definition language (DDL) for SQL Server 2012 as well as a sample generated SQL Server 2012 database. The DDL includes views and tables used to extract, transform and load the ARTS Data Warehouse Model Version 3.0. It also includes sample reference data for item categories and calendar.
- ❖ Applies a number of corrective modifications to the ARTS Version 6.1 Operational Data Model including a substantial rework of the till settlement entities, attributes and definitions to improve consistency;