



Data Model Conformance Program

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Stuart McGrigor

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1 INTRODUCTION

The Association for Retail Technology Standards (ARTS) has developed an industry standard retail data model, primarily focused on the store. Vendors who develop software compliant with the model offer retailers significant benefits, notably in the ease with which they can integrate solutions from more than one supplier. To assure retailers that a vendor's software is compliant with the data model, ARTS offers a conformance audit service to identify compliant vendors. By taking and passing the audit test the vendor confirms to retailers that their software meets the inter-operability standards specified by ARTS, a key factor in lower the integration costs to the retailer thus making the vendor's application more desirable.

The ARTS Data Model conformance test has been established to allow the vendor being tested to select the business function(s) within the Model against which they wish to be tested. It is not necessary to be conformant to the entire Model. The test is largely automated if the vendor being tested has used the physical data names supplied with the Model. If other unrelated names have been used it is necessary to perform some pre-test adjustments to the test software or the vendor data files to be tested.

The test software compares the data, entities and columns within the Model to the files supplied by the vendor. The test software compares for optional, mandatory and not required elements. The test indicates that the vendor data conforms to the data elements and structure of the Model. At this time, it cannot validate that the vendor has correctly followed the data definitions or that the application will perform as represented by the vendor provider.

The Data Model conformance test requires an on site or internet access audit by an ARTS authorized expert. An audit is required as the implementation of the Model provides many options based on the target application(s). These will be further discussed within the details of this document. The assigned expert will assist the vendor to set-up and operate the test, analyze the results, clarify discrepancies, suggests actions to increase conformance and score results. The audit requires 3 or more days depending on the data name alignment and requested actions by the vendor to increase conformance. Costs are \$1,000 testing fee and \$880 per day plus expenses for the audit.

Vendors who pass the test will be authorized to place the ARTS Data Model logo on compliant products and their name along with appropriate product information will be posted to the ARTS Website conformance area. Those failing to obtain a passing score of 60% will not be posted or otherwise identified.

1.1 **ARTS Data Model**

The ARTS data model defines data used by retail business applications. It allows retailers and solution providers to create applications that will inter-operate with each other and be portable among software and hardware platforms.

The current data model (version 4.01) contains 454 entities and 3,344 attributes that support the development of most retail store applications; including Point of Sale, Promotions, Inventory, Tender Control and Customer Marketing.

1.1.1 **Business Functions & Subject Areas**

With more than 400 entities the data model requires some organization. Accordingly, it is organized into 10 business functions, with each business function being broken down into a further set of Subject Areas. The current 10 Business Functions and their Subject Areas are:

❖ **Merchandise Flow Management**

- Direct Store Delivery
- Receiving
- Return to Vendor
- Stock Adjustment
- Transfer In Processing
- Transfer Out Processing

❖ **Inventory Management**

- Physical Inventory
- Retail stock Ledger Maintenance

- ❖ **Item & Price Maintenance**
 - Electronic Labeling
 - Item Labeling
 - Item Maintenance
 - Price Derivation Rules Maintenance
 - Shelf Labeling

- ❖ **Point of Sale Processing**
 - POS Access Control
 - POS Account Maintenance
 - POS Payment Processing
 - POS Price Derivation
 - POS Sales & Returns Processing
 - POS Sales Tax Processing
 - POS Tender Processing
 - POS Transaction Log Processing
 - POS Void Processing
 - Price Lookup

- ❖ **Tender Control**
 - External Authorization
 - Media Balancing
 - POS Loan/Pickup processing
 - Positive/Negative Authorization
 - Tender Deposit

- ❖ **Store Administration**
 - Accounting Period Close
 - Accounting Period Open
 - Financial Adjustments
 - Party Maintenance
 - Petty Cash Disbursements
 - Store Access Control
 - Store Calendar Maintenance
 - Store Controls Maintenance
 - Store Item Tax Maintenance
 - Store Merchandise location Maintenance
 - Store Rules Maintenance

- ❖ **Store & Productivity Reporting**
 - Reporting Hierarchy Maintenance
 - Sales Analysis
 - Store Performance Reporting

- ❖ **Ordering**
 - Direct Store Delivery Ordering
 - Order Creation
 - Replenishment Management

- ❖ **Workforce Management**
 - Employee Maintenance
 - Employee Performance Management
 - Time and Attendance
 - Workforce Planning

- ❖ **Customer Relationship Management**
 - Customer Data Collection
 - Customer Maintenance
 - Employee Customer Management
 - Gift Registry
 - Loyalty Program Management
 - Micro-Marketing

1.2 Retail Segments

Traditionally the retail industry was split into a number of different retail segments, with each segment having special characteristics delineating it from the others. The definitions of each retail segment given below are a somewhat naïve view of the various retail segments, and are intended to show the inapplicability of such naïve definitions to the reality of 21st century retailing.

Core: A special Retail Segment defining the entities that are required in all retail store systems. The core without any other entities constitutes the minimal set of entities required of a retail store system and still actually be able to stock & sell an item, and keep track of the money taken in exchange for that item.

Convenience Store: A convenience store is open 24 hours a day, so it does only cycle inventory management, and has special problems with accounting periods that start & stop at irregular intervals. They tend not to run any customer loyalty program. Convenience Stores do not sell Bulk, Apparel or Serialized items. They will sell only Shelf and Rental Service items. Stores tend not to have complex merchandise hierarchies, and do not support complex price derivations.

Department Store: Department Stores do actually close every day, so they don't have the 24-hour operation problems of the Convenience & Forecourt segments. Department stores sell Shelf, Apparel, Serialized, Bulk and Service Items. Department Stores have complex customer driven price derivations, and have all types of customer account.

Drug: Stock Items need to be identified by Lot number as well as SKU etc. Customer Accounts, Loyalty Programs. Many Drug Stores also use customer loyalty schemes to drive complex customer driven price derivations.

Forecourt: The forecourt retail segment has all the properties of a Convenience store, but it also sells Bulk Items (petroleum products) via Pumps on the forecourt. Physical Inventory of these Bulk Items is also be

performed daily, and in many cases will be performed automatically by tank gauging equipment connected to the retail system. In many cases, the petroleum products will also be consignment stock, with the retail commission on the stock varying as the retail price for the stock varies.

Grocery: Grocery retail segment stores do actually close every day, eliminating the 24 hour operation problems of Convenience & Forecourt segments. Grocery stores sell Stock & Service Items, and do not sell Apparel Serialized or Service Items. Grocery stores do have complex customer driven price derivations, and customer loyalty accounts, although they don't have customer trade, or consumer charge accounts.

Hard-line: The hard-line segment must identify product to the unique level for warrantee and return processing.

Home Center: Home centers carry some stock items (Wallpaper & Paint) that need to be identified by Lot number. They also have special requirements for Bulk Items, Customer & Trade Accounts and Complex price derivation rules?

Warehouse Club: Warehouse club have membership and identify the customer with each sale. They carry many of the items of most of the above segments, so have many of the different processes under one roof.

The lines between the various traditional retail segments have been blurred by recent trends as retailers expand their merchandise offering crossing what use to be separate segments. Grocery stores are selling gas and other petroleum products, Department stores have added grocery departments and Drug stores are often open 24 hours like convenience stores. This blurring of the traditional retail segment lines means it is inappropriate to target the conformance program at the traditional retail segments, thus a recent change to the test software is to remove the test specification for retail segments.

2 CONFORMANCE MATRIX

The conformance matrix is the key ingredient of the test software. It identifies which entities (and columns of those entities) are Mandatory, Optional or Not Required for each business function subject area.

2.1.1 Optional Entities:

Entities that are optional within a business function subject area are very problematical to the conformance program. e.g. In the POS Sales Tax Processing business function, some entities are required no matter the style of taxation being imposed (US style sales tax or Europe style VAT tax). TaxAuthority, TaxGroup-TaxAuthorityRule, TaxableItemGroup.

Other entities to do with taxation (TaxExemptionModifer, TaxExemptOrganization, SalesReturnTaxLineItem, TaxLineItem) may be Mandatory in a sales tax jurisdiction, but not required in a VAT tax jurisdiction. Making these entities optional in the conformance program would render the conformance program useless to any retailer, because a statement of conformance to such a POS Sales Tax Processing business function would not allow him to differentiate between a retail system that only handles European VAT versus a retail system that handles both US Sales Tax and European VAT.

2.1.2 Optional Columns:

Just as entities can be Mandatory, Optional or Not Required, so can some columns, e.g. Some columns in the Tax history and summary tables (OperatorTaxHistory, POSDepartmentSalesTaxHistory, SessionTax, StoreTaxHistory & TillTaxHistory) will be mandatory or not required depending on the style of tax supported. I.e. Columns recording total VAT tax paid & received on the supply side of the business will be mandatory in a VAT style tax jurisdiction and not required in a Sales Tax jurisdiction. Again, making such columns optional in the conformance program will render the conformance program useless to the retailer trying to differentiate candidate retail systems.

2.1.3 Related Optional Entities:

Another problem with optional entities arises when only one of two related optional entities is present in a candidate system. e.g. The entities ForeignCurrencyTenderLineItem and Currency are clearly related even though there is no explicit relationship in the data model between them. (One entity records the acceptance of foreign currency, and the other records the existence of acceptable foreign currency).

Both entities are optional within the POS Tender Processing business function. If the ForeignCurrencyTenderLineItem entity were present in a candidate retail system without the Currency entity also being present, then a conformance certificate would again be of little or no use to a retailer.

2.1.4 Business Function Options:

The data model committee has decided that the solution to the impasse created by optional entities and columns is to create Business Function Options. Entities & Columns will be Mandatory or Not Required for a particular business function option rather than the business function as a whole. In the above examples, the POS Sales Tax Processing business function would have the following options:

Core: Entities TaxAuthority, TaxGroup-TaxAuthorityRule & TaxableItemGroup would all be mandatory in this business function option.

Sales Tax style: The entity SalesReturnTaxLineItem as well as columns totaling supply side taxation paid would be Not Required; while the entity TaxLineItem a would be marked as Mandatory for this business function option.

European VAT style: The entity SalesReturnTaxLineItem as well as columns totaling supply side taxation paid would be Mandatory; while the entity TaxLineItem a would be marked as Not Required for this business function option.

Exemptions allowed: Entities TaxExemptionModifier, & TaxExemptOrganization would both be mandatory in this business function option.

In the foreign currency example the POS Tender Processing business function would have an option of Foreign Currency Support, which would make the two mentioned entities mandatory.

3 PRIMARY KEYS, RELATIONSHIPS & DATATYPES

The simple existence or non-existence of entities and columns in the data model standard is a necessary but insufficient conformance test. Therefore the following tests are also included on all tables found to be in the conformance program.

3.1 Logical Tables

A candidate system may include some (or all) entities in the ARTS data model as database views rather than as actual tables. This is an expected outcome in the highly normalized sections of the data model such as the Party and Party Address sections of the model.

3.2 Primary Keys

A primary key for any table defined in the data model standard may be substituted for a synthesized primary key in any candidate system. In which case the defined primary key should be present in the table as an alternate key. The conformance audit will check for the existence of all primary keys on those entities that are present in the candidate system.

e.g. The primary key for the entity Session is made up of three columns, OperatorID, WorkstationID and StartDateTime. This three-part key is then migrated to a foreign key on the Transaction entity. This foreign key has a large storage requirement on a large system. By making the standard defined primary key an alternate key for the entity Session, and creating a new column SessionID as the primary key for Session, the data storage requirement for the Transaction table will be greatly reduced.

3.3 Relationships

When a relationship exists in the data model standard between two mandatory entities then the relationship shall be mandatory. When a relationship exists in the data model standard between two entities that are either Mandatory or Optional then the relationship shall be optional.

4 DATA MODEL USAGE CONFORMANCE

For each business function the Data Model Committee establishes and maintains data model usage criteria whereby the candidate software shall be run, and the database shall be tested to check that the candidate system is properly using the Data Model.

e.g. If the VAT Taxation business option is included in a candidate system, then the conformance audit shall include checking that a transaction selling an item that is liable for VAT tax includes a record in the SalesReturnTaxLineItem table.

5 CONFORMANCE AUDIT SOFTWARE

The goal of the conformance program is to have as much of the conformance audit performed automatically by software as is possible. Any other audit mechanism will involve a high degree of manual checking of SQL scripts and the candidate database system. This would make such a conformance audit prohibitively expensive.

The self-test software is written in Java and requires a JDBC connection to the candidate database to be examined. The JDBC-to-ODBC bridge provided as part of the Java Runtime Environment makes all databases that have ODBC drivers available to the Java Runtime Environment, and therefore all ODBC compatible databases will be auditable.

5.1.1 Supported Versions

The conformance audit software tests the candidate system for the existence of Mandatory & Optional Tables, Columns, Relationships and Data-types.

The current version of the audit software includes conformance matrices for the following supported versions of the Data Model:

- Version 3.0
- Version 4.01

5.1.2 Conformance Matrices

The conformance matrices for each supported version of the data model are published as part of the Data Model in the following volume: *Retail Data Model Near Physical View – Volume V (Conformance Matrix)*. It details which Business Function Options are supported in that release of Data Model, as well as detailing which tables and columns are Mandatory, Optional or Not Required for those Business Function Options.

5.1.3 Candidate Business Function Choice:

The major The second input required by the audit software is an XML file listing the business functions and business function options implemented by the candidate system that are to be audited for conformance. e.g.

```
<Conformance>
  <ItemMaintenance>
    <ApparelItem>Present</ApparelItem>
    <BulkItem>Present</BulkItem>
    <DepositItem>Absent</DepositItem>
    <FuelItem>Absent</FuelItem>
    <GiftCertificate>Present</GiftCertificate>
    <RentalItem>Absent</RentalsItem>
```

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```
<Serialized>Present</Serialized>
<ServiceItem>Absent</ServiceItem>
</ItemMaintenance>

<POSTransaction>
  <CommissionSales>Present</CommissionSales>
  <ItemRestrictions>Absent</ItemRestrictions>
  <LineItemTax>Present</LineItemTax>
  <PriceDerivations>Present</PriceDerivations>
  <TransactionTax>Present</TransactionTax>
</POSTransaction>

<InventoryManagement>
</InventoryManagement>
</Conformance>
```

The tags in the Candidate XML file correspond to the set of business functions in the conformance matrix for the release of the Data Model chosen by the user, and instructs the conformance software which business function options are to be audited in the candidate database.

The conformance audit software provides a user-interface screen that assists the vendor to create this required input file.

5.1.4 CONFORMANCE AUDIT REPORT

Once the conformance software has completed the audit, it will produce an audit report, which contains:

- ❖ A Summary listing:
 - The number of **required** tables defined by the set of vendor selected business function options, as well as the numbers of such required tables that were found & missing.
 - The number of **optional** tables defined by the vendor select set of business function options, as well as the numbers of such optional tables that were found & missing.
 - The number of **extra** tables not defined by the set of vendor selected business function options that were found.
 - The number of **required** columns defined by the set of vendor selected business function options, as well as the numbers of such required columns that were found and missing.
- ❖ The set of Tables that were expected to be present in the candidate system database, and were found using the proper ARTS data model physical name.
- ❖ The set of Tables that were expected to be present in the candidate system database, and were found using a physical name from an earlier version of the ARTS data model.

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- ❖ The set of Tables that were expected to be present in the candidate system database and were not found by the audit software.
- ❖ The set of Tables that are optional for the selected business functions, and were not found in the candidate system database.
- ❖ The set of Tables that are found using ARTS data model physical name in the candidate system database, even though they are neither required nor optional within the set of vendor selected business functions.
- ❖ The set of Tables that are found to be present in the candidate system database, and are not defined by the ARTS Data Model. These tables fall into three categories:
 - Non-ARTS defined tables that duplicate tables defined by the ARTS data model.
 - Non-ARTS defined tables that present a de-normalized view of a structure defined by ARTS, for system efficiency purposes.
 - Non-ARTS defined tables that present additional functionality that is not defined in the ARTS data model.
 -
-

6 Business Function Options

The Conformance Matrices for the Data Model supports the following set of business function options:

Note: Both Version 3.0 and Version 4.01 of the data model support most of the business function options. Those options that are supported only in Version 4.01 of the data model are marked as such in the list.

6.1 Access Control:

Controls access to system functions, on either a per-Operator, per-Workgroup or per-Workstation basis. Supported options include:

- **Operator:** Access permissions and prohibitions are allocated to individual Operators.
- **Operator Group:** Access permissions and prohibitions are allocated to groups of Operators.
- **Workstation:** Access permissions and prohibitions are allocated to workstations.

6.2 Item Maintenance:

The Creation, Deletion and Update of Item descriptions, shelf-labels, prices and advanced pricing rules. Supported options include:

- **Core:** Base entities required by all Item and Price maintenance functions.
- **Scheduled Update:** Records scheduled updates to Item descriptions ahead of time.
- **Taxation:** System records taxability of items, as well as rules for calculating applicable taxes. Including:
 - Assigning Tax Rules to groups of Stores. (Vn 4.01)
 - Different Taxation Rules when shipping goods to different taxation jurisdictions. (Vn 4.01)
- **Brand & Manufacturer:** Records Manufacturer and Brand information about the Item
- **Supplier:** Records primary and secondary suppliers for the Item.
- **Competitor Item:** Records corresponding Items stocked by a competitor retailer.
- **Loyalty:** System records loyalty points that are issued when the item is sold?

- **Discount:** System supports general discounts in addition to pricing rules.

6.2.1 Item Types:

The system supports special functionality for particular kinds of Item Supported Item Type Options are:

- **Apparel:** Records Style, Color and Style information about clothing, shoes and fashion accessories.
- **Bulk:** Records information required when purchasing an Item in bulk, and breaking it down by weight (or some other measure) for sale.
- **Collection:** Records the fact that an Item may be a Collection assembled from other Items.
- **Deposit:** Records empty container deposit information about an Item.
- **Display Unit:** Records special detail about Racks, Shelves & other Display Units within the Item maintenance function.
- **Fuel:** Records specific gravity and handling conditions for Petroleum based products such as Gasoline, Diesel, LPG, etc.
- **Pack:** Records extra information about Items that are a Pack of other Items. (Vn 3.0, Removed in Vn 4.01 in favor of Collection)
- **Gift Certificate:** Records details of Gift Certificates available for sale and redemption
- **Rental:** Item is rented to customer rather than sold.
- **Serialized:** Individual instances or lots of an Item, are identified with serial numbers or lot numbers
- **Service:** Item is a non-tangible (also referred to non-merchandise) item which is performed for the customer.
- **Prepared:** Item is constructed from one or more Bulk Items using a Recipe, which may have regional variations. (Vn 4.01)

6.2.2 Item Labeling:

Records extra data required about the Item to produce item and shelf labels.

- **Core:** Base entities required for all kinds of item and shelf labels.
- **Item:** Extra data required to generate item price tickets.
- **Shelf:** Extra data required for item shelf labels
- **Electronic:** Extra data required for in-store electronic shelf labels for this item

6.2.3 Item Classification:

Denotes which structures in the Data Model are used to classify merchandise for reporting (and other) purposes.

- **Core:** Base entities for grouping Items.
- **POS Department:** The system groups items by POS Department. (Vn 3.0 only)
- **Merchandise Hierarchy:** System groups Items by merchandise class

6.2.4 Item Price Maintenance:

The System records permanent and temporary lookup prices for an Item

- **Scheduled:** Records price changes that are scheduled to happen at some time in the future.
- **Fuel:** Records Full Serve/Self Serve price level, as well as Cash/Credit Card pricing for Petroleum products.
- **Store Group:** Item Prices are targeted to groups of Stores (Vn 4.01)
- **POS Identity:** Item Prices **may** be specific to particular UPCs or Barcodes (Vn 4.01)

6.2.5 Advanced Price Rules:

The system records the advanced pricing rules, which may change the lookup price for a particular transaction.

- **Core:** Base entities to support simplest advanced pricing rules.
- **Complex:** Extra data required for advanced pricing rules with complex eligibility criteria, and promotion reporting
- **Scheduled:** Extra data required to schedule creation and update of advanced pricing rules in advance.
- **Eligibility:** The collection of available advanced pricing rule eligibility criteria
 - **Brand:** Entities required to support advanced pricing rules, targeted at all Items in a particular Brand.
 - **Customer Account:** Extra data required to support advanced pricing rules targeted at particular account customers.
 - **Customer Group:** Extra data required to support advanced pricing rules targeted at particular groups of customers.
 - **Employee:** Extra data required to support advanced pricing rules targeted at particular groups of employees.
 - **Manufacturer:** Extra data required to support advanced pricing rules targeted at Items from a particular manufacturer.
 - **Market Basket:** Extra data required to support advanced pricing rules targeted at transactions with a particular total value.
 - **Merchandise Hierarchy:** Extra data required to support advanced pricing rules targeted at all the items in a particular merchandise class or category.

- **Price Line:** Extra data required to support advanced pricing rules targeted at Items whose lookup price falls into a particular range.
- **Season:** Extra data required to support advanced pricing rules targeted at Items which are related to a particular season.

6.2.6 ItemMaintenance/SellingRules:

Records various conditions that are placed upon the sale of an Item.

- **Core:** Base entities required for recording Item selling rules
- **Age Restriction:** Item may not be bought or sold by person below a certain age.
- **License Restriction:** Item may not be bought without recording license details.
- **Selling Period Restriction:** Item may not be sold at certain times of particular days.
- **Tender Restrictions:** Item may not be paid for with particular Tenders.
- **Store Group:** Item selling rules are targeted to particular groups of Stores (Vn 4.01)
- **POS Identity:** Item selling rules **may** be targeted to particular UPCs or Barcodes. (Vn 4.01)

6.3 Merchandise Flow:

Records the movement of Stock in and out of the 'back door' of a retail store. Includes stock movement to and from distribution centers, other stores as well as Suppliers.

- **Core:** Base entities required by all merchandise flow business functions.
- **Direct Store Delivery:** Receipt of Stock directly from Suppliers, without a matching order.
- **Receiving:** Receipt of merchandise from Suppliers, matching with retailer created originating orders.
- **Return To Vendor:** Movement of merchandise back to Supplier for credit, potentially matching against Supplier generated return authorization.
- **Transfer In:** Receipt of merchandise from distribution center or another store in the enterprise. Perhaps records movement of merchandise between different locations in the store.
- **Transfer Out:** Sending merchandise to another store in the enterprise. Perhaps records movement of merchandise between different locations in the store.

6.4 Inventory Management:

Business activities, in addition to Merchandise Flow management, that are required to maintain an accurate physical item inventory.

- **Core:** Base entities required by all Inventory Management business functions.
- **Stock Adjustment:** Records manually entered adjustments to stock-on-hand figures.
- **Stock Ledger Maintenance:** Maintenance of inventory Locations and the closure of Stock Ledger
- **Physical Inventory:** Records the schedule for and results of physical inventory process (also known as 'Stock-take').
 - **Core:** Records non-scheduled Physical Inventory (or Stock-take) that has been performed
 - **Scheduled:** Extends core Physical Inventory business function, to allow the Physical Inventory to be scheduled by central office.
 - **Fuel:** Extends core Physical Inventory business process for the Forecourt retail segment.

6.5 POS Processing:

The day-to-day retail operations that are performed at the POS in the store

- **Core:** POS performs price lookup for an item.
- **Service Item:** POS can sell non-merchandise items, that have special terms and conditions
- **Gift Certificate:** POS can issue Gift Certificates
- **Item Deposit:** POS can sell and redeem item container deposits
- **Rental Item:** POS can rent an Item to the customer rather than sell it.
- **Gift Registry:** POS can create and modify Gift Registry
- **Commission:** POS can calculate sales commission due to an employee.
- **Fuel Item:** POS performs prepay and post-pay fuel sale transactions.

6.5.1 **Advanced Price Rules:**

The system allows advanced pricing rules to be applied at POS.

- **Core:** Apply the simple advanced pricing rules at POS.
- **Complex:** Apply complex and Mix 'n Match advanced pricing rules at POS.
- **Eligibility:** Advanced pricing rule eligibility criteria.
 - **Brand:** POS can apply advanced pricing rules based upon the Brand of the item being sold.

- **Customer Account:** POS can apply advanced pricing rule based upon Customer Account being used to tender the sale.
- **Customer Group:** POS can apply advanced pricing rules based upon a group the Customer is a member of.
- **Employee:** POS can apply advanced pricing rules to transactions performed where the Customer is also an Employee
- **Manufacturer:** POS can apply advanced pricing rules, based upon the Brand of an Item being sold.
- **Market Basket:** POS can apply advanced pricing rules, on the basis of the total value of the transaction.
- **Merchandise Hierarchy:** POS can apply advanced pricing rules based upon the merchandise classification the Items being sold are part of.
- **Price Line:** POS can apply advanced pricing rules, based upon price range that the Item being sold falls into.
- **Season:** POS can apply advanced pricing rules, based upon the Season that an Item is targeted to.

6.5.2 Item Selling Rules:

POS can restrict sales based upon certain criteria.

- **Core:** Base entities required for all selling rules.
- **Age Restriction:** Item may not be bought or sold by person below a certain age.
- **License Restriction:** Item may not be bought without recording license details.
- **Selling Period Restriction:** Item may not be sold at certain times of particular days.
- **Tender Restrictions:** Item may not be paid for with particular Tenders.
- **Store Group:** Item selling rules are targeted to particular groups of Stores (Vn 4.01)
- **POS Identity:** Item selling rules **may** be targeted to particular UPCs or Barcodes. (Vn 4.01)

6.5.3 Tendering:

POS can accept cash and other forms of Tender in payment of a transaction.

- **Core:** Applicable tender types are defined
- **Denominations:** System records the available denominations of a currency.
- **Foreign:** POS can accept Tender in a foreign currency.

- **Gift Certificate:** POS can redeem Gift Certificates as part of the tendering process.
- **Manufacturer Coupon:** POS can accept Manufacturer issued coupons during the tendering process.
- **Store Coupon:** POS can accept retailer issued coupons during the tendering process.
- **Trade In:** POS can record the details of any Trade-in-Kind that was accepted during the tendering process.
- **Customer Account:** POS can charge a transaction against a Customer Account.
- **Loyalty Account:** POS calculates and issues loyalty points during the tendering process.

6.5.4 Taxation:

POS uses Tax rules to calculate applicable sales and consumption taxes.

- **Core:** Base entities required to calculate applicable sales & consumption taxes.
- **Exemption:** POS uses CRM structures to grant tax exemptions.
- **Store Group:** Assigning Tax Rules to groups of Stores. (Vn 4.01)
- **Shipping:** Different Taxation Rules when shipping goods to different taxation jurisdictions. (Vn 4.01)

6.6 POS-Log:

POS records completed transactions in the POS-Log structures of the data model.

6.6.1 Retail Transaction:

POS records Retail Transactions

- **Core:** POS records ordinary sale transactions, with simple cash tendering.
- **Item Deposit:** POS records container deposit sales and redemptions.
- **Fuel Item:** POS records forecourt fuel sales.
- **Gift Certificate:** POS records the sale of Gift Certificates.
- **Gift Registry:** POS records details of a Gift Registry purchase when it is made.
- **Miscellaneous Fee:** POS records non merchandise-sales as Miscellaneous Fee.
- **Serialized Item:** POS records serial or batch lot numbers when serialized Items are sold.
- **Customer Info:** POS records generalized customer information.
- **Customer Account Payment:** POS records house account payments as part of a Retail Transaction.

- **Promotional Line Item:** POS records promotional gifts that are given as part of a Retail Transaction.
- **Commission:** POS records commission that is payable to the employee making a sale.
- **Price Modifier:** POS records individual price modifications that may be made.
 - **Discount:** POS records price modifications as separate line items in the Retail Transaction.
 - **Derivation Rules:** POS records price modifications against a specific line item.
- **Taxation:** POS records the sales or consumption tax that is payable as a consequence of the transaction.
 - **Transaction:** POS records the total tax liability for the entire transaction.
 - **Line Item:** POS records tax liability on each applicable line item.
- **Tender:** POS records tendering of a Retail Transaction with tender other than Cash.
 - **Credit Debit:** POS records transaction tendering with Credit or Debit cards.
 - **Check:** POS records transaction tendering with customer issued checks.
 - **Customer Account:** POS records transaction tendering with Customer house accounts.
 - **Gift Certificate:** POS records transaction tendering with Gift Certificates.
 - **Manufacturer Coupon:** POS records transaction tendering with Manufacturer issued coupons.
 - **Trade In:** POS records transaction tendering with Customer Trade-in-Kind.
 - **Foreign Currency:** POS records transaction tendering with cash, checks, or credit cards denominated in a foreign currency.
 - **Send Check:** POS records tendering of a refund by having the retailer send a check to the customer.

6.6.2 Control Transaction:

POS records non-sale Control Transactions.

- **Core:** Base entities required to record non-sale Control Transactions.
- **POS Access Control:** POS records access control actions.
- **Period Control:** POS records accounting period closures.
- **Forecourt Control:** POS records miscellaneous Forecourt management actions.

- **Settlement:** POS records Till, Store Safe and External Depository tender settlements.
- **POS No Sale:** POS records attempts to open the Cash Drawer without performing a transaction.
- **Post Voids:** POS records voiding of a transaction after it has been tendered.

6.6.3 Financial Account Transaction:

POS records financial accounting and adjustment transactions.

6.6.4 Tender Control Transaction:

Records the movement of Cash (and other Tender) between Store Safes, Tills, and external depositories (Banks).

- **Core:** Base entities required to record Tender movement.
- **Pickup Loan Deposit:** System records movement of tender between Till and Store Safe.
- **Petty Cash:** System records disbursement and receipt of cash.
- **Safe Transfer:** System records movement of tender between Store Safes.
- **Deposit:** System records removal of Tender from the store to an external depository.

6.7 Reporting

Reporting sales and productivity performance of various aspects of the retail store.

- **Core:** Base entities required for all reporting summary data.
 - **Fiscal Calendar:** The time dimension for system reports consists of a single fiscal calendar hierarchy, with pre-defined periods Day, Week, Month, Quarter and Year. (Vn 3.0)
 - **Abstract Calendar:** The time dimension for system reports consists of any number of vendor defined abstract calendars, using appropriate periods of arbitrary length. (Vn 4.01)
- **Financial:** Does the system maintain a Financial Ledger summary of retail operations, as export to corporate General Ledger?
- **Employee Discounts:** System records per-Employee summaries of all employee discounts granted.
- **Workstation Time Activity:** System records Workstation activity summaries for short time periods (in the region of 5 - 30 minutes)
- **Workstation Access Control:** System records Workstation based access control overrides.

6.7.1 Sales:

System records sales summary data

- **Item Sales:** System records sales summaries for each individual Item sold.
- **Merchandise Hierarchy:** System records sales summaries for merchandise classification groups.
- **Selling Price:** System records sales summaries, detailing the prices items have been sold for.
- **Related Item Reports:** System records sales summaries, for when sets of related items are sold in the same transaction.

6.7.2 Tender

System records Tender summary data

- **Store:** System records per-Store Tender summary data.
- **Operator:** System records per-Operator Tender summary data.
- **Workstation:** System records per-Workstation Tender summary data.
- **Session:** System records per-Session Tender summary data.
- **Till:** System records per-Till Settlement Tender summary data.
- **Safe:** System records per-Safe Settlement Tender summary data.
- **Depository:** System records per-Depository Settlement Tender summary data.

6.7.3 Tax:

Store records sales Tax liability summary data.

- **Store:** Store records per-Store sales Tax liability summary data
- **Operator:** Store records per-Operator sales Tax liability summary data
- **Workstation:** Store records per-Workstation sales Tax liability summary data
- **Session:** Store records per-Session sales Tax liability summary data
- **Till:** Store records per-Till Settlement sales Tax liability summary data.
- **POS Department:** Store records per-POS Department sales Tax liability summary data

6.7.4 Reporting/Productivity:

System records retail operations productivity data.

- **Store:** System records simple per-Store retail operations summary data
- **Operator:** System records simple per-Operator retail operations summary data.
- **Workstation:** System records simple per-Workstation retail operations summary data
- **Session:** System records simple per-Workstation Session retail operations summary data.

- **Till:** System records simple per-Till Settlement retail operations summary data
- **Safe:** System records simple per-Safe Settlement retail operations summary data
- **Depository:** System records simple per-Depository Settlement retail operations summary data.
- **POS Department:** System records simple per-POS Department retail operations summary data

6.7.5 Reporting/Forecourt:

System records Forecourt operations summary data.

- **Nozzle:** System records per-Nozzle Forecourt operations summary data
- **Prepay:** System records per-Fueling Point prepay summary data

6.8 Ordering:

System supports retailer generation of orders against Suppliers for new merchandise.

- **Service Item:** System records the terms and conditions for the provision of Service Items.
- **Stock Item:** System records Supplier provided catalogs for merchandise that the retailer orders.
- **Deal:** System records Supplier provided catalogs and special deals for merchandise that the retailer orders.

6.9 Employee:

System records Employee details

- **Core:** System maintains name and address data about Employees
- **Discount:** System grants special discounts for Employees
- **Access Control:** System records Employee (via Operator) based access controls
- **Work Conditions:** System records details about the Working Conditions of each Employee

6.10 Customer:

System provides some Customer Relationship Management functions.

- **Core:** System maintains Name and Address data about Customers
- **Account:** System maintains a variety of Customer Accounts.

- **Gift Registry:** System can create and maintain Gift Registries on behalf of Customers.
- **Preference:** System records data about Customer's preferences.

6.11 **Equipment:**

System records details about Workstations and other equipment in the store.

- **Workstation:** System records details about each Workstation (or Register)
- **Forecourt:** System records details about the various devices used for selling gasoline that are on the Forecourt.