Audit Data Collection Standard
ADCS
TC/SC: ISO/PC 295

LOGICAL DATA MODEL

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STRUCTURE OF WD2

Objective of Standardization described in DP2 Clause 4 (p.6)

"The objective of documents is **to specify clear and unambiguous provisions** in order to help international trade and communication. To achieve this objective, **documents shall**:

- be complete within the limits specified by their scope;

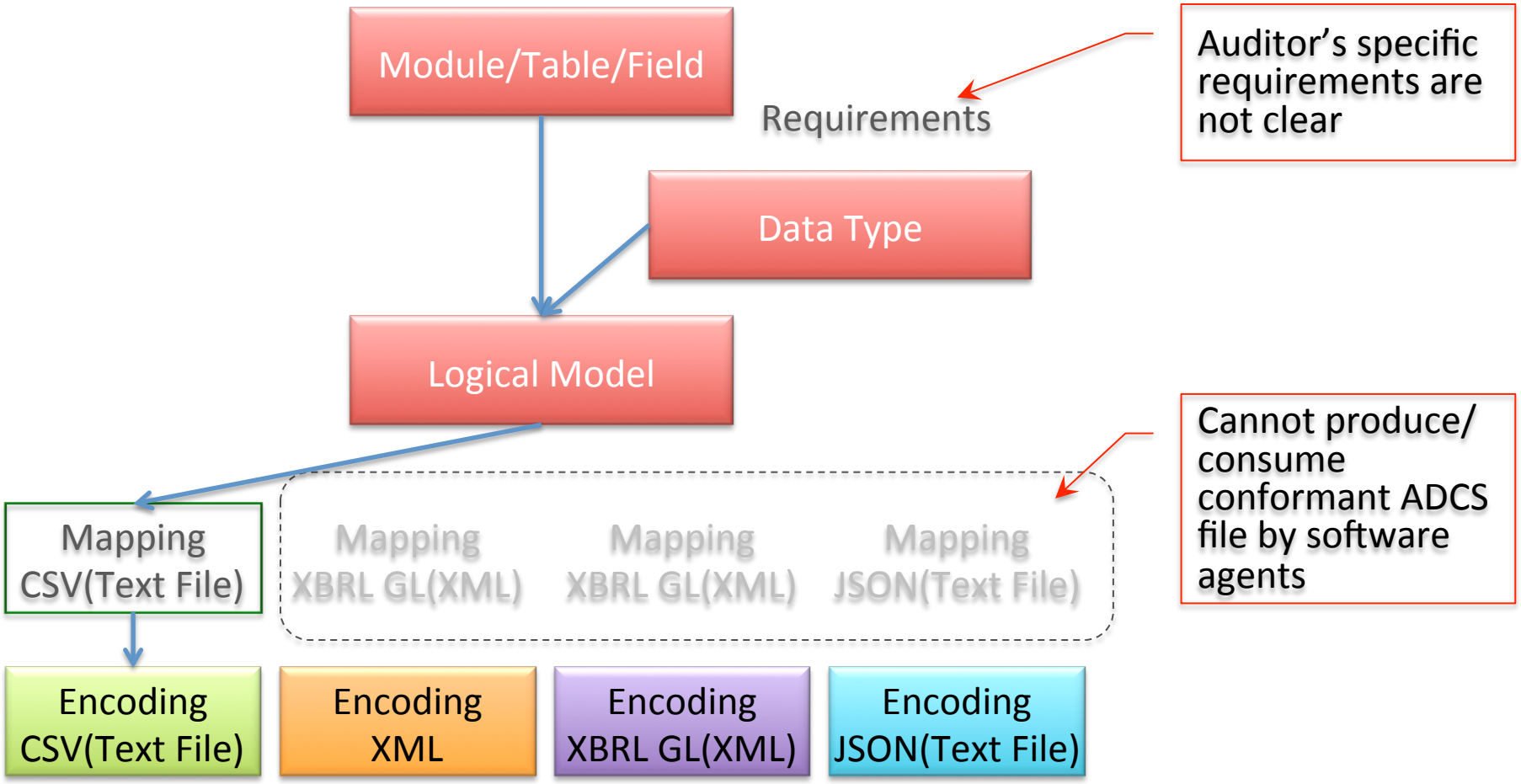
NOTE 1 When a document provides requirements or recommendations, these are either written explicitly, or made by reference to other documents.

- be consistent, clear and accurate;
- be written using all available knowledge about **the state of the art**;
- take into account the current market conditions;

NOTE 2 There is sometimes a tension between what is technically feasible and what the market actually requires and is prepared to pay for.

- **provide a framework for future technological development;**
- be comprehensible to qualified people who have not participated in their preparation; and
- conform to **the ISO/IEC Directives, Part 2**.

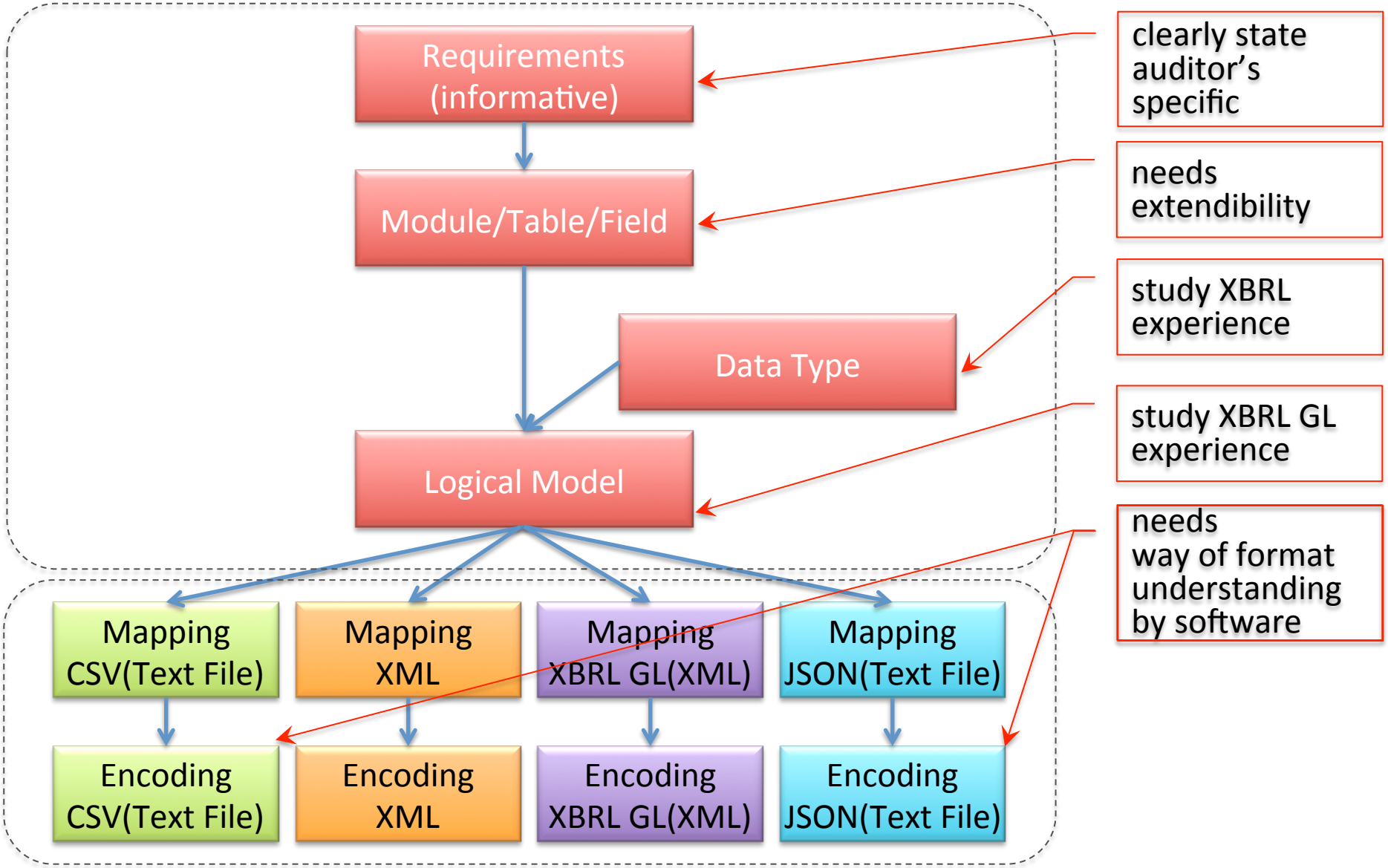
Structure of WD2



Challenges

- Include urgent requirements
- Support future requirements
- How to maintain this standard
- Both humans and software agents can easily understand and process the audit dataset with ADCS
- Conformance

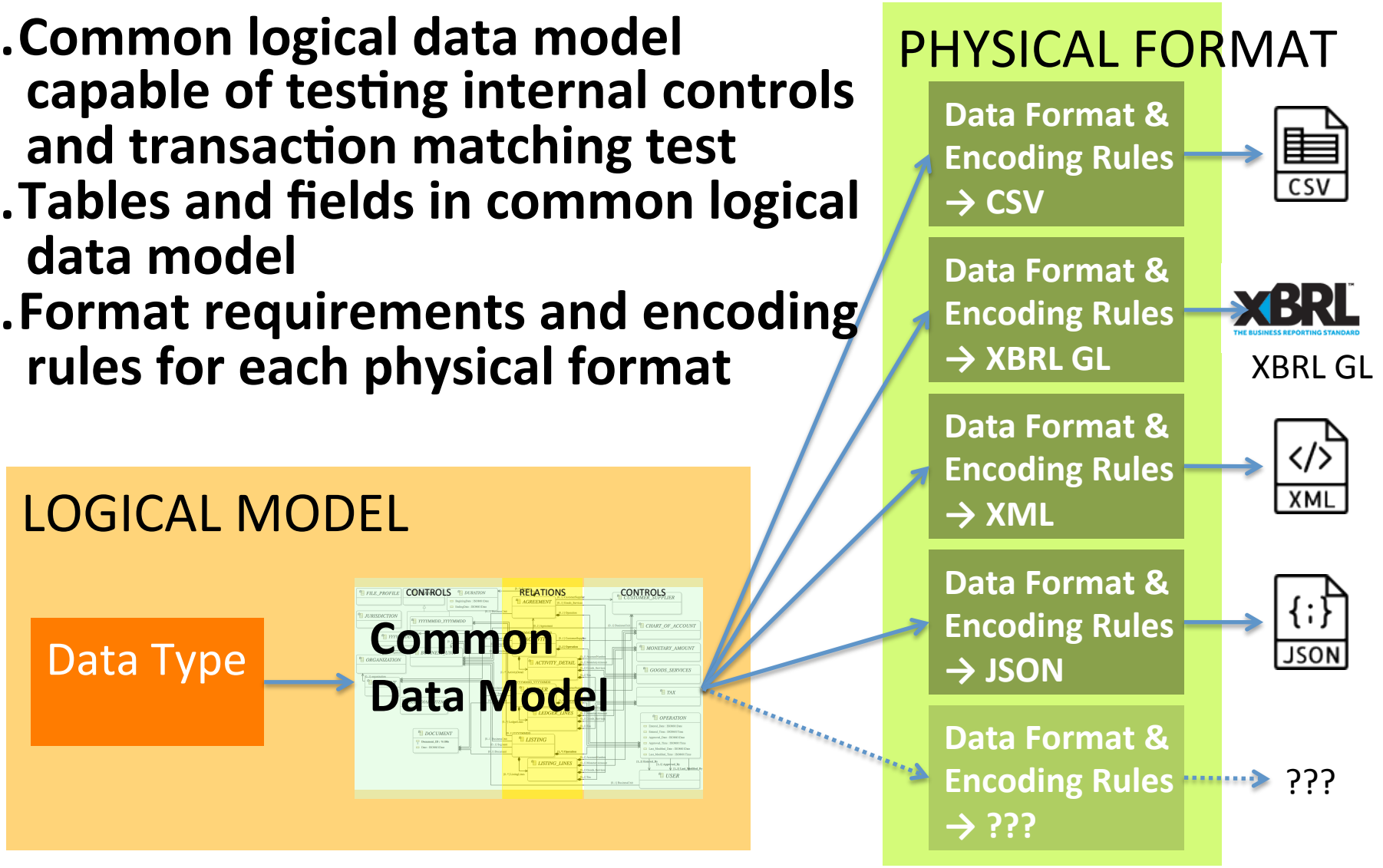
Ideal Structure for WD3



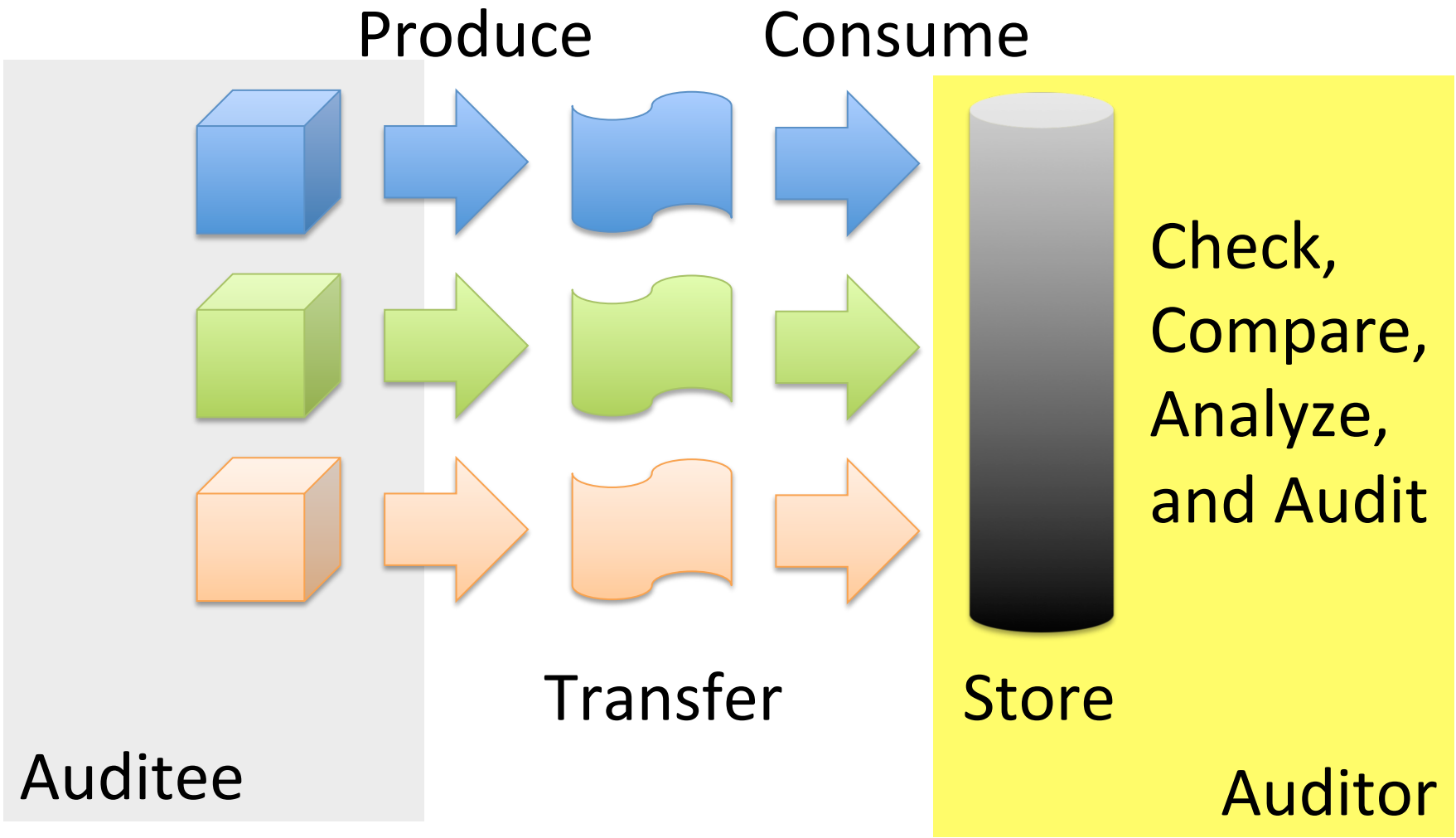
LOGICAL DATA MODEL

Common Logical Data Model for Different Physical Formats

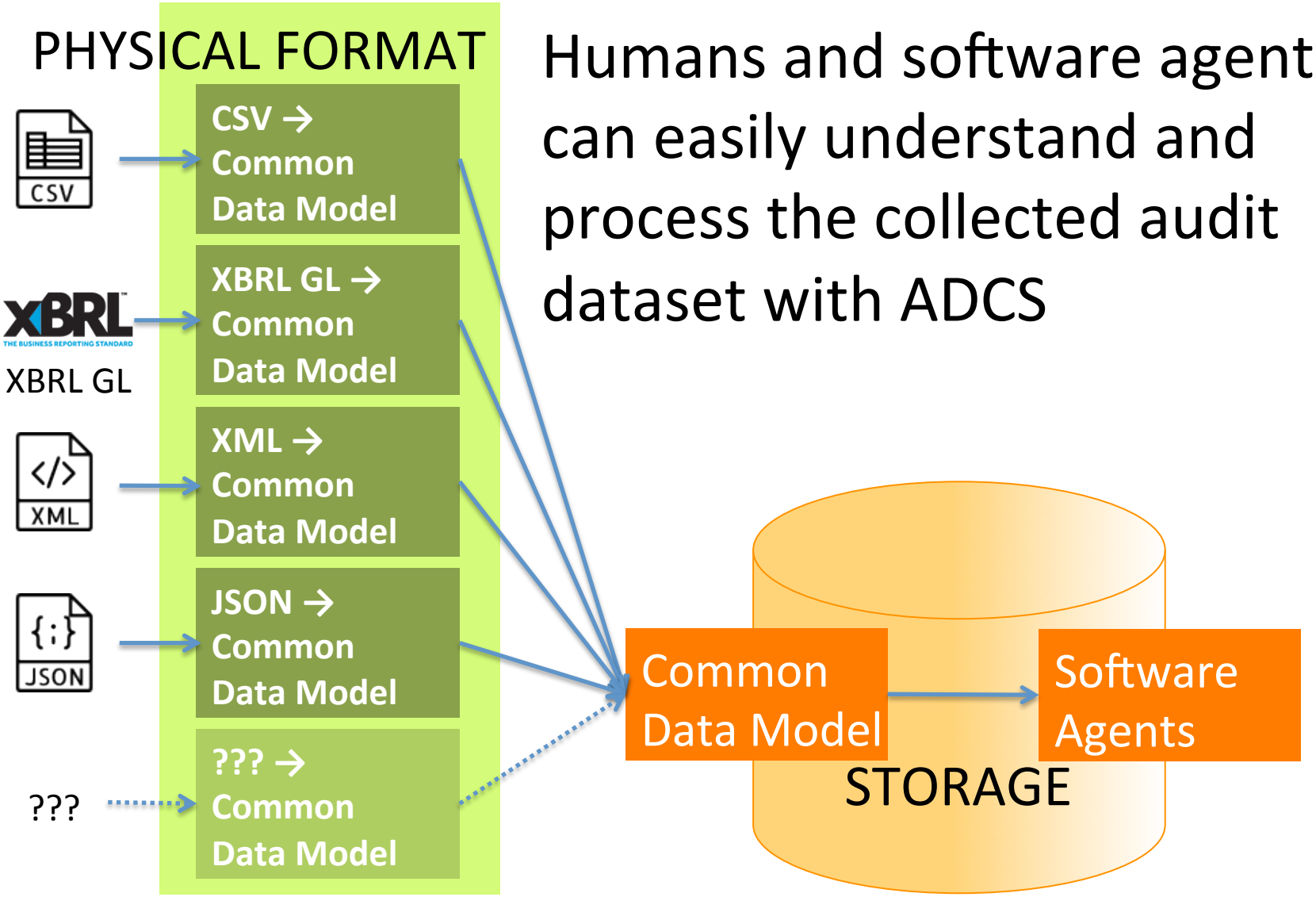
1. Common logical data model capable of testing internal controls and transaction matching test
2. Tables and fields in common logical data model
3. Format requirements and encoding rules for each physical format



Audit Data Supply Chain



Common Logical Data Model from Different Physical Formats



Humans and software agents can easily understand and process the collected audit dataset with ADCS

DATA TYPE

Data Representation in WD2

ADCS(WD2) Representation			
%1c	%1s	%2d	%5.4f
%3c	%2s	%4d	%10.2f
%4c	%3s	%6d	%13.4f
%8c	%4s		%13.5f
	%5s		%15.10f
	%6s		%15.1f
	%10s		%20.2f
	%12s		%25.10f
	%15s		%30.10f
	%20s		%30.1f
	%25s		
	%30s		
	%50s		
	%60s		
	%75s		
	%80s		
	%100s		
	%128s		
	%200s		
	%256s		
	%300s		
	%512s		
	%1000s		
	%2000s		

INTOSAI Denotation			
C1	C..2	I..2	D13.4
C2	C..4	I..4	D20.2
C4	C..5		D20.4
C8	C..6		D20.6
	C..10		D3.2
	C..15		
	C..20		
	C..30		
	C..60		
	C..200		
	C..300		
	C..1000		
	C..2000		

ADS Datatype	Length
BOOLEAN	
DATE	
TIME	
NUMERIC	
TEXT	1
TEXT	3
TEXT	4
TEXT	6
TEXT	10
TEXT	12
TEXT	20
TEXT	25
TEXT	50
TEXT	75
TEXT	100
TEXT	256

Lexical representation is not sufficiently define how to handle data by software.
Use datatypes instead of %representation.

What's to be done with `%30.10f` ?

Do you really want to store this numeric value?

12, 345, 678, 901, 234, 567, 890. 123 456 789 0

Numeric data type supported by modern programming language CAN NOT STORE THIS NUMERIC VALUE AS REQUIRED ACCURACY.

A 64-bit register can store 2^{64} different values.
-9, 223, 372, 036, 854, 775, 808 (-2^{63})
through 9, 223, 372, 036, 854, 775, 807 ($2^{63} - 1$)
Total digits = 19

Or use BCD(Binary Coded Decimal) ?

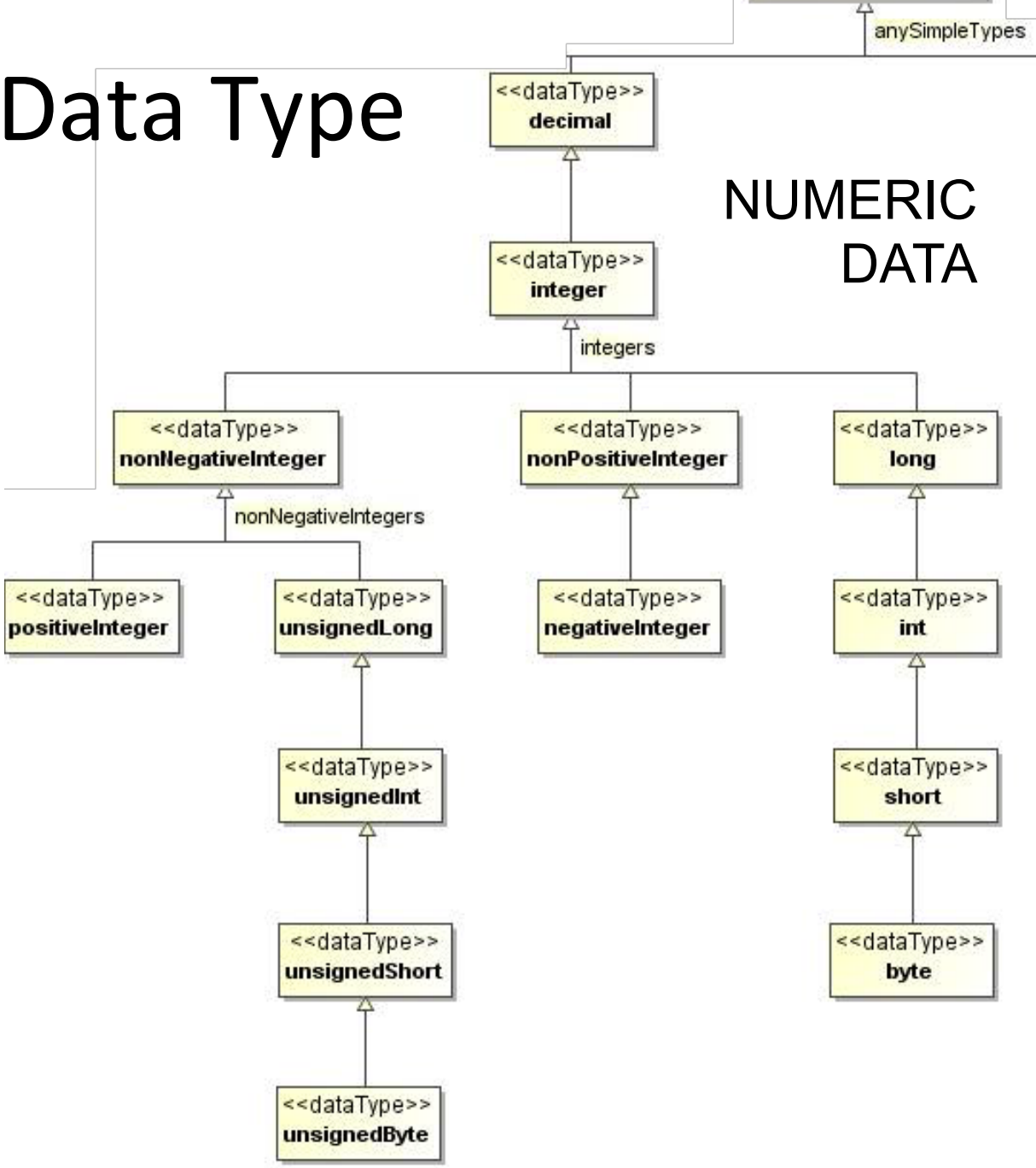
"During fiscal year 2016, the Federal government received approximately $3.3 trillion in tax and fee revenue and had outlays (spending) of $3.9 trillion." Wikipedia
$3.9trillion($10^{12}$) = $3,900,000,000,000.00

XML Schema Data Type

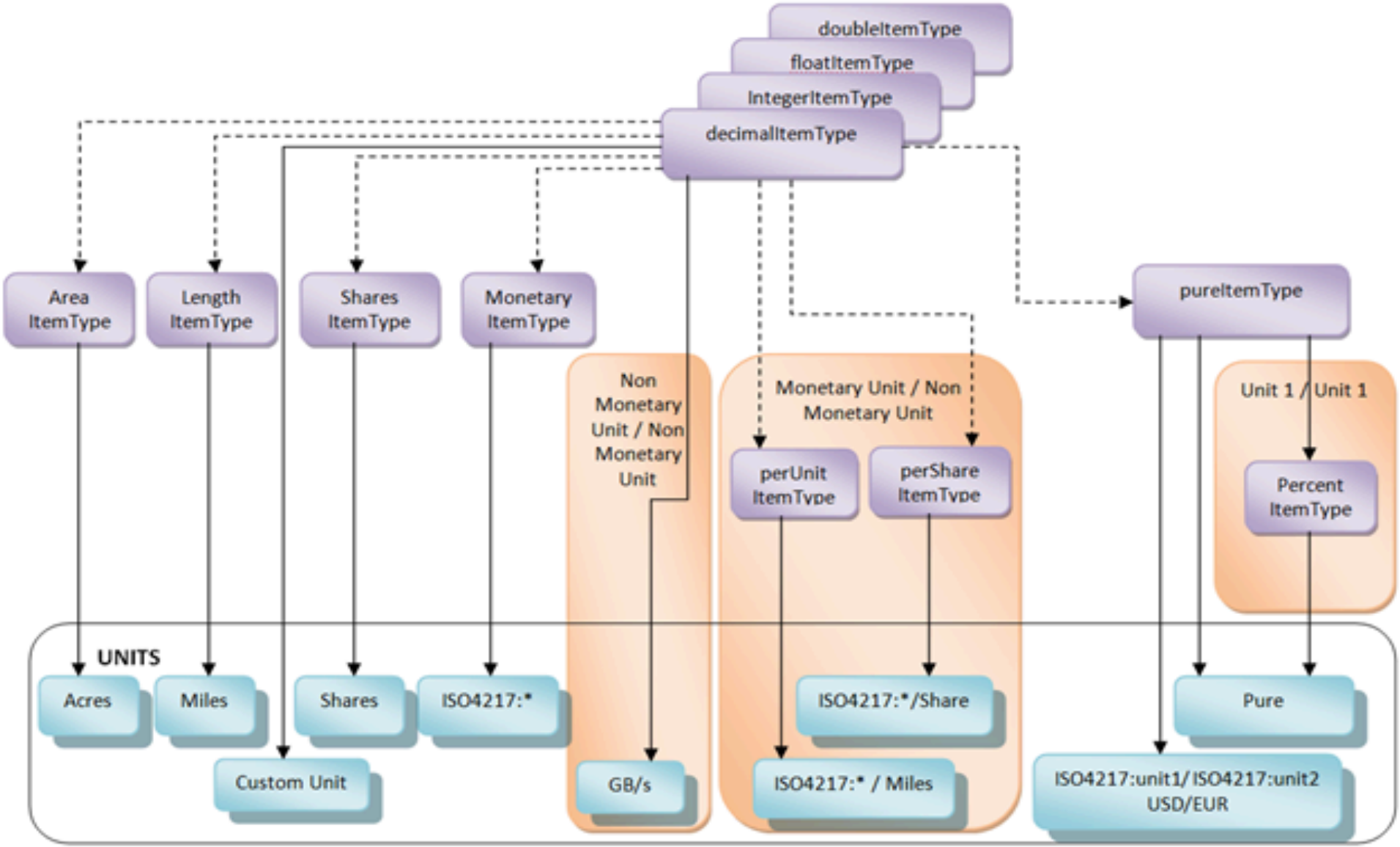
SELECT APPROPRIATE DATA TYPE

Monetary Amount
Physical Quantity
Counts
Rational Number
1/6 = 0.1666666667 ?
Exchange Ratio
Pure Ratio

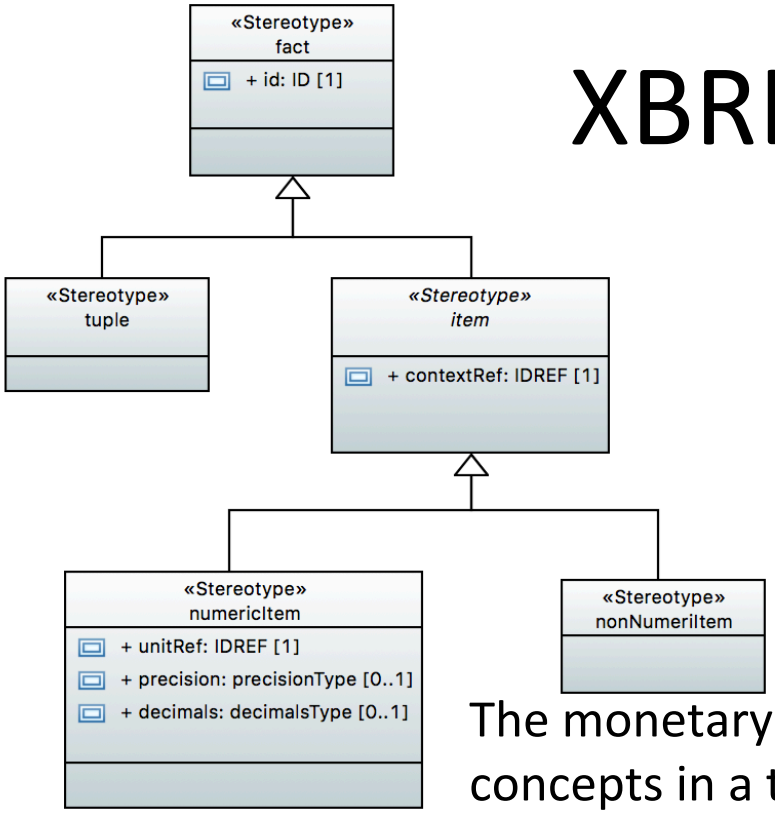
OR DEFINE APPROPRIATE DATA TYPE



“XBRL Data Types and Associated Units” XBRL US



https://xbrl.us/guidance/data-types-and-associated-units/



XBRL Data Type

XBRL Data Types are derived from XML Schema Data Type.

Numeric Item type has precision, decimal attributes in XBRL.

monetary Item Type

The monetary type serves as the datatype for those financial concepts in a taxonomy which denote units in a currency. Instance items with this type must have a unit of measure from the ISO 4217 namespace of currencies.

shares Item Type

This datatype serves as the datatype for share based financial concepts.

pure Item Type

This datatype serves as the type for dimensionless numbers such as percentage change, growth rates, and other ratios where the numerator and denominator have the same units.

@decimals in XBRL

Description of accuracy of amount	Attribute and attribute value to be used	reported	a<=x	x<=b	x<b
exact amount	decimals="INF"	1234567.89	1234567.89	1234567.89	
rounded or truncated to millions	decimals="-6"	1000000.00	500000.00		1500000.00
rounded or truncated to thousands	decimals="-3"	1234000.00	1233500.00		1234500.00
rounded or truncated to units	decimals="0"	1234567.00	1234566.50		1234567.50
rounded or truncated to cents	decimals="2"	67.89	67.885		67.895

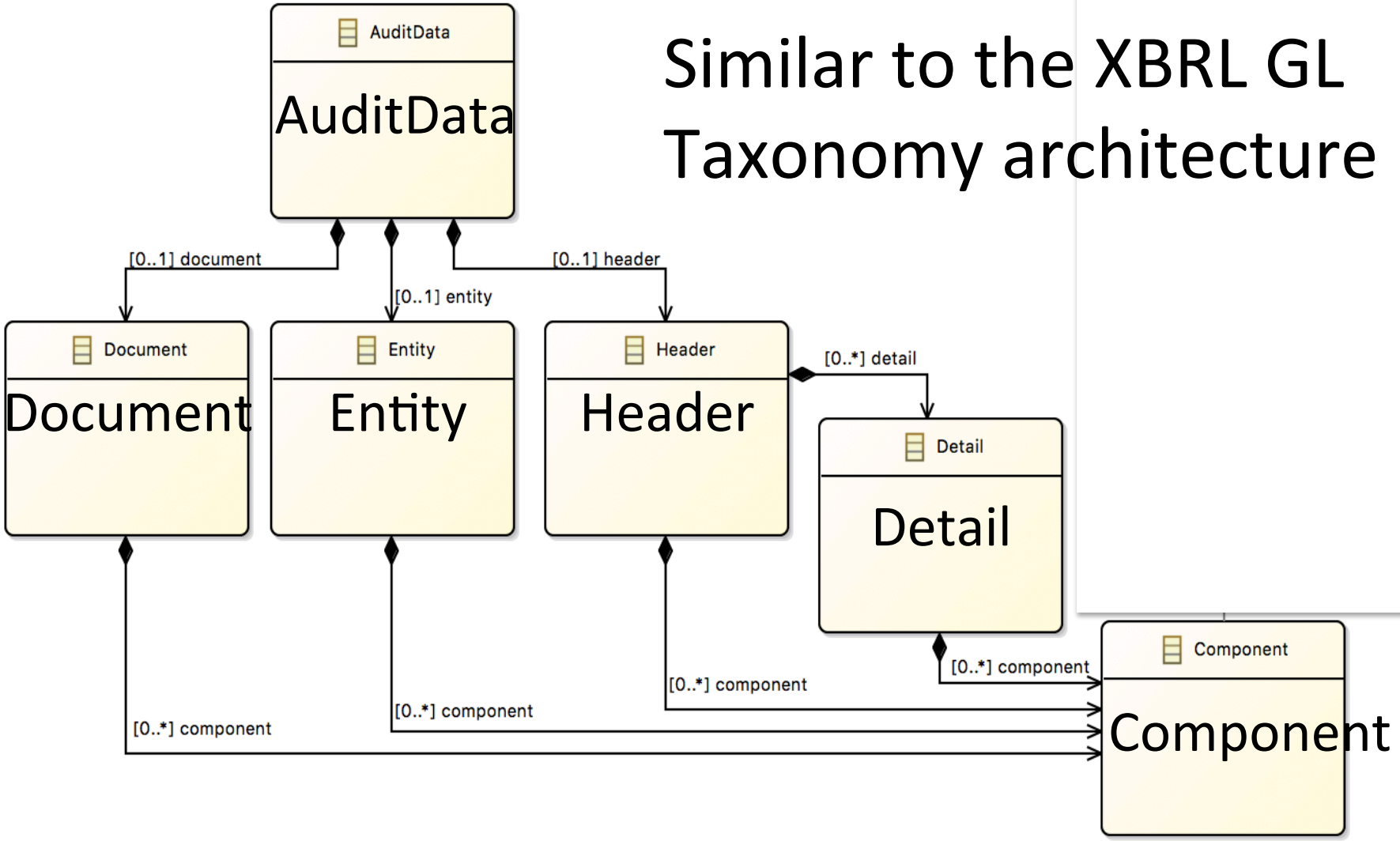
For the readability of the instance in financial reporting, numeric facts should use the @decimals attribute in preference to the @precision attribute.
Humans seem to have an easier time reading a document that uses the @decimals attribute because the decimals value is likely to be only one of 2, 0, -3, -6, -9 or INF.

Candidates for Non-numeric Data Types

	Description	Candidate for Data Type
%1c	Y (Active) or N (Inactive), it indicates whether this Code is active.	Boolean
%3c	The recording currency According to the ISO 4217:2001.	ISO4217CurrencyCode
%4c	Year—YYYY , YYYYMMDD (ISO8601)	ISO8601Year
%8c	Date expressed using ISO8601 (YYYYMMDD).	ISO8601Date
%4c	ISO8601 representing time in 24-hour time(hhmm)	ISO8601Time
%15c	ISO 8601 representing date and time of day in "YYYYMMDDThhmmss".	ISO8601TimeOfDay
%3s	The country code Recommend ISO31661 Alpha 2 or ISO 3166-1 Alpha 3 format (XX or XXX).	ISO3166-1CountryCode
%6s	state or province Recommend ISO3166–2.	ISO3166-2SubdivisionCode
%25s %60s %100s	Unique identifier (character strings not include white spaces and/or other special characters)	normalized string
%1000s %2000s	Description (This may require rich text presentation in local language)	TBD HTML?

DATA TYPE 2

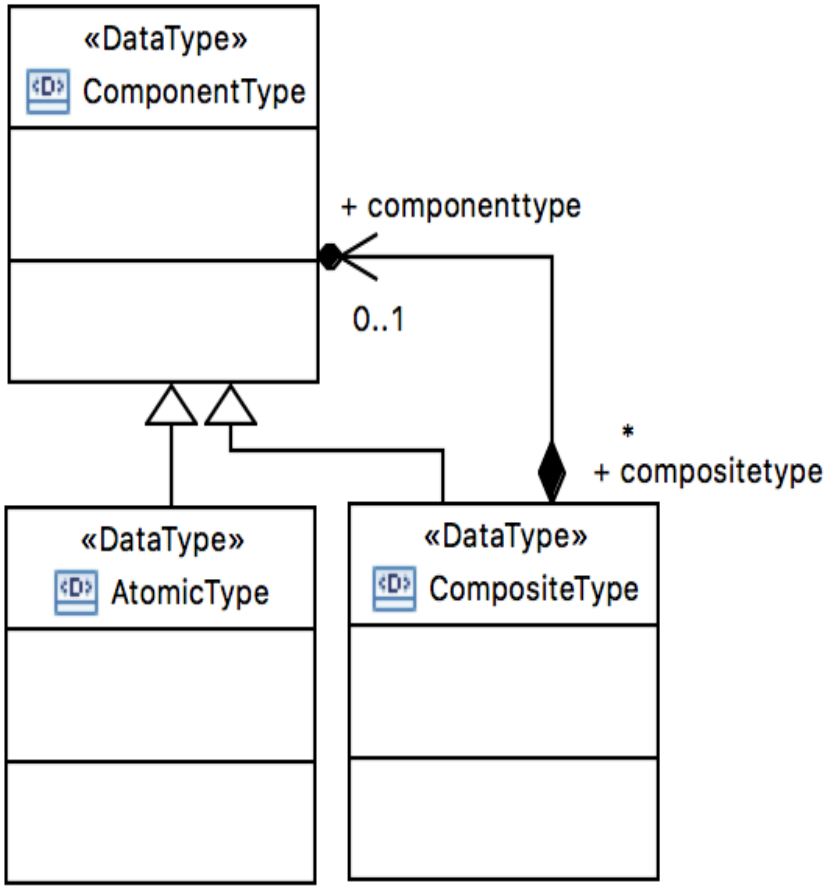
ADCS Data Types



Similar to the XBRL GL Taxonomy architecture

Atomic & Composite Data Type

Component Type may contain data elements of Atomic Type or Composite Type.



Atomic Type

Datatype, each data object of which consists of a single nondecomposable data value

Composite Type

Datatype that has a data structure composed of the data structures of one or more datatypes and that has its own set of permissible operations

LOGICAL DATA MODEL MAPPING

Mapping ADCS to ADCS Logical Model

ADCS(WD2)

Sales_Orders

#	Field	Level
1	Business_Unit_Code	1
2	Sales_Order_ID	1
3	Sales_Order_Number	1
4	Fiscal_Year	1
5	Accounting_Period	1
6	Sales_Order_Type	1
7	Sales_Order_Date	1
8	Sales_Unit_Code	1
9	Salesman_Name	2
10	Customer_Account_ID	1
11	Payment_Receipt_Type	1
12	Payment_Term_Code	1
13	Sales_Order_Amount_Local	1
14	Sales_Order_Local_Currency	1
15	Document_Status	2
16	Entered_By	1
17	Entered_Date	2
18	Entered_Time	2
19	Approved_By	2
20	Approved_Date	2
21	Approved_Time	2
22	Last_Modified_By	2
23	Last_Modified_Date	2
24	Last_Modified_Time	2
25	Note	1

Sales_Order_Details

Logical Model

AiditData

Document

Attribute	Car
DocumentStatus	1

Entity

Attribute	Car
FiscalYear	1
AccountingPeriod	1
BusinessUnitCode	1

Header

Attribute	Car	
SalesOrderID	1	Key
SalesOrderNumber	1	
SalesOrderType	1	
SalesOrderDate	1	
SalesUnitCode	1	
SalesmanName	0..1	
PaymentReceiptType	1	
PaymentTermCode	1	
EnteredAction	1	Com
ApprovedAction	0..1	Com
LastModifiedAction	0..1	Com
SalesOrderAmountLocal	1	
SalesOrderLocalCurrency	1	
CustomerAccountID	1	Ref
Note	1	

EnteredAction

Attribute	Car
EnteredBy	1
EnteredDate	0..1

ApprovedAction

Attribute	Car
ApprovedBy	1
ApprovedDate	0..1

LastModifiedAction

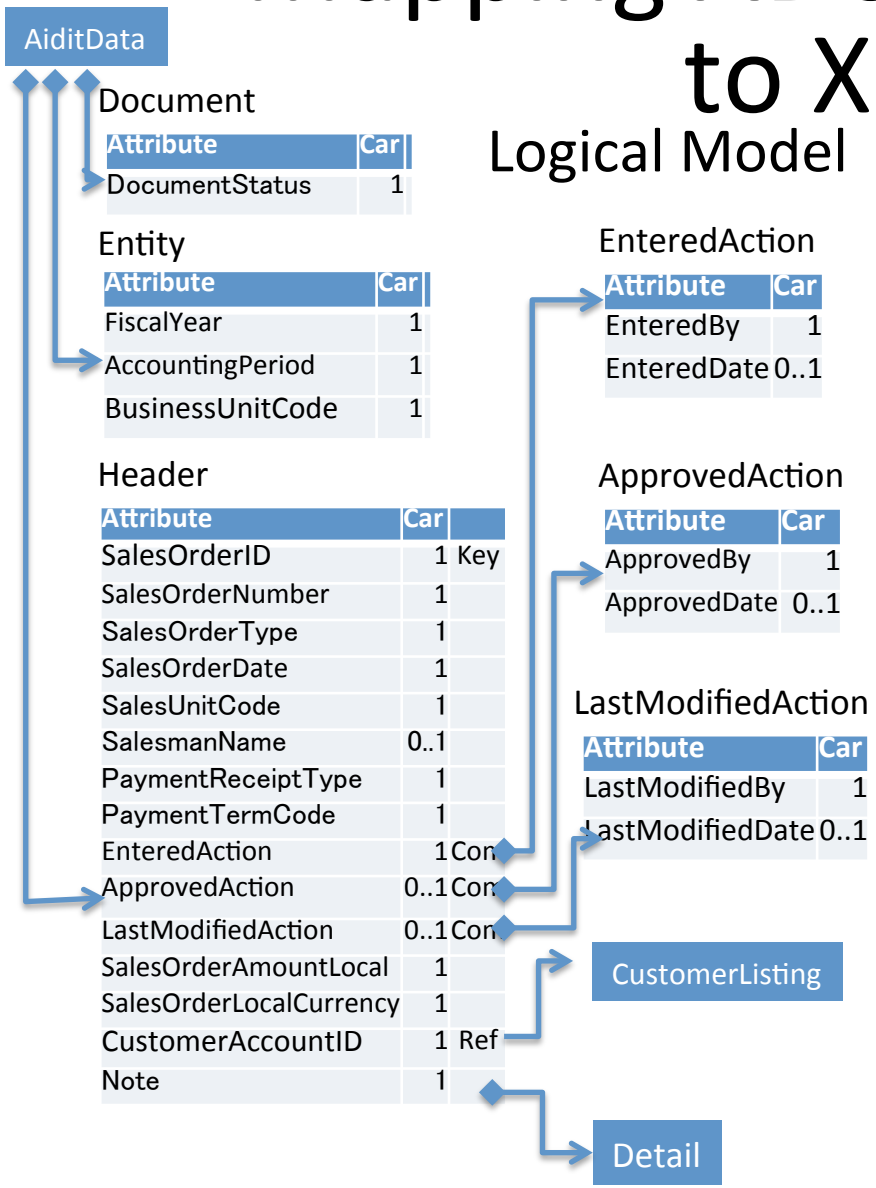
Attribute	Car
LastModifiedBy	1
LastModifiedDate	0..1

CustomerListing

Detail

Mapping ADCS Logical Model to XBRL GL

Logical Model

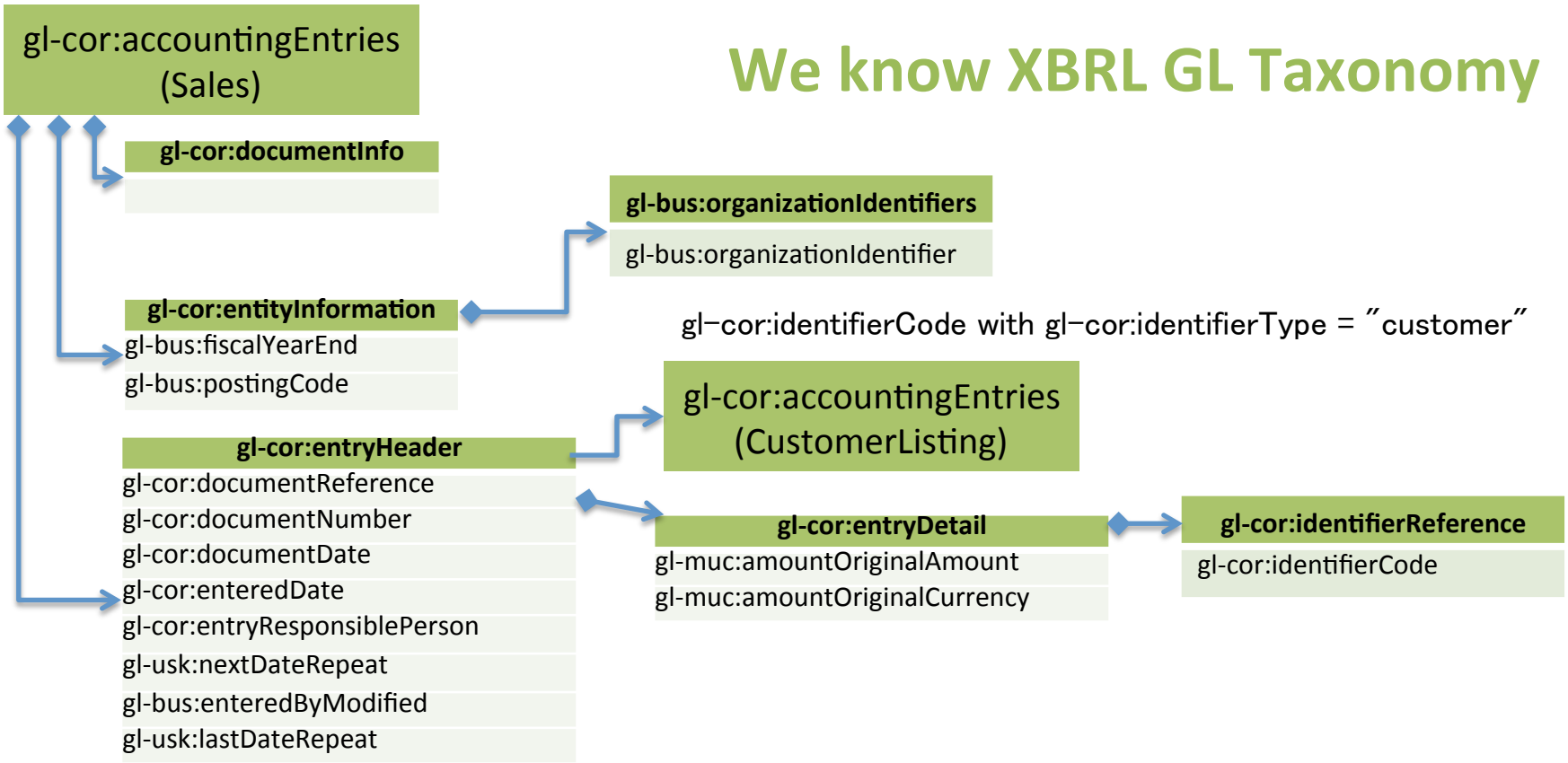


Mapping

Attribute	Item
DocumentStatus	TBD
FiscalYear	gl-bus:fiscalYearEnd
AccountingPeriod	gl-bus:postingCode
BusinessUnitCode	gl-bus:organizationIdentifier
SalesOrderID	gl-cor:documentReference
SalesOrderNumber	gl-cor:documentNumber
SalesOrderType	TBD
SalesOrderDate	gl-cor:documentDate
SalesUnitCode	TBD
SalesmanName	TBD
PaymentReceiptType	TBD
PaymentTermCode	TBD
EnteredBy	gl-cor:identifierCode
EnteredDate	gl-cor:enteredDate
ApprovedBy	gl-cor:entryResponsiblePerson
ApprovedDate	gl-usk:nextDateRepeat
LastModifiedBy	gl-bus:enteredByModified
LastModifiedDate	gl-usk:lastDateRepeat
SalesOrderAmountLocal	gl-muc:amountOriginalAmount
SalesOrderLocalCurrency	gl-muc:amountOriginalCurrency
CustomerAccountID	gl-cor:identifierCode with gl-cor:identifierType = "customer"
Note	TBD

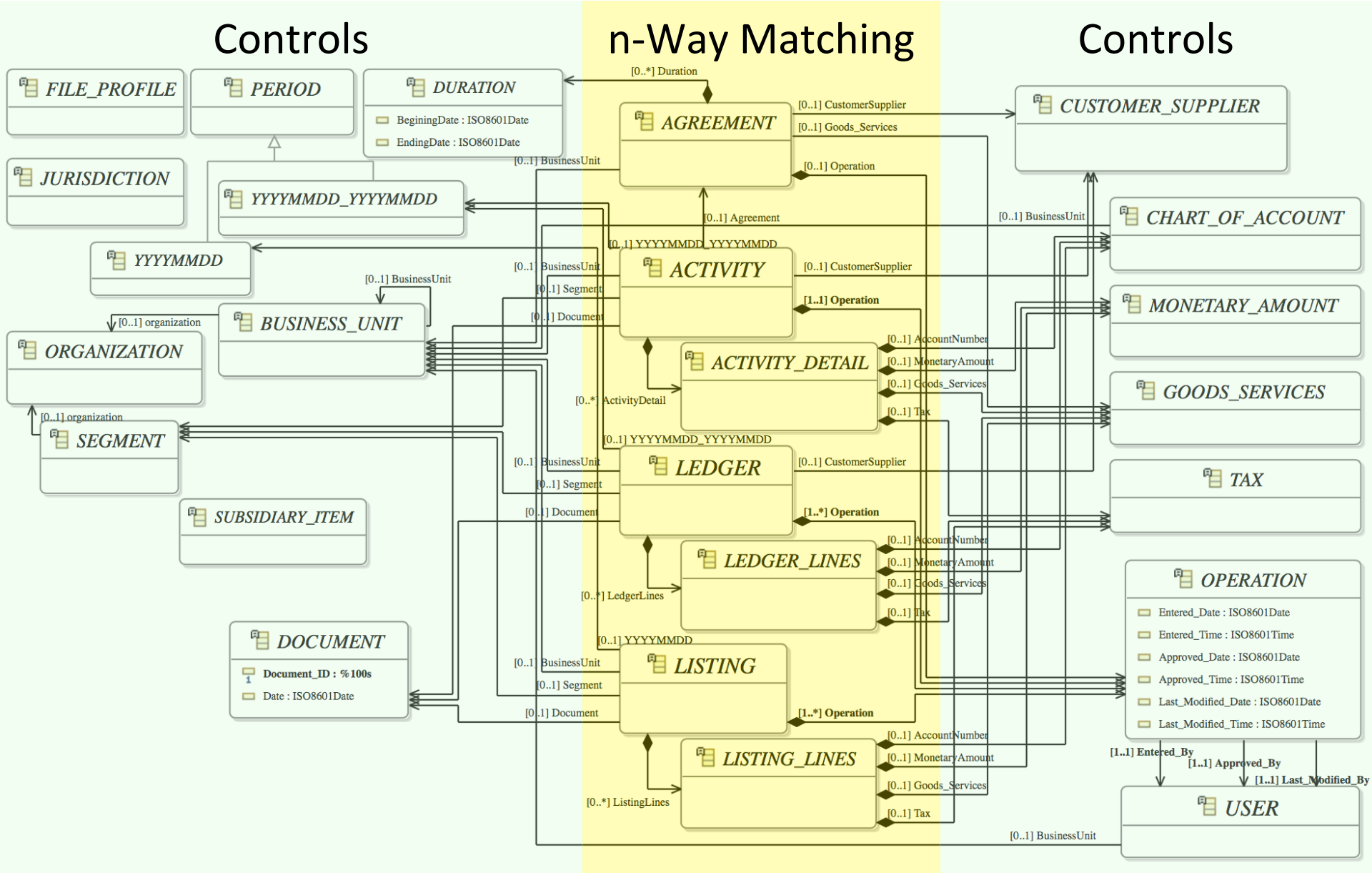
XBRL GL item name is UNIQUE within Taxonomy

Resulting XBRL GL



ADCS Logical Model

http://wuwei.space/pc295/uml/



RESEARCH MEMO

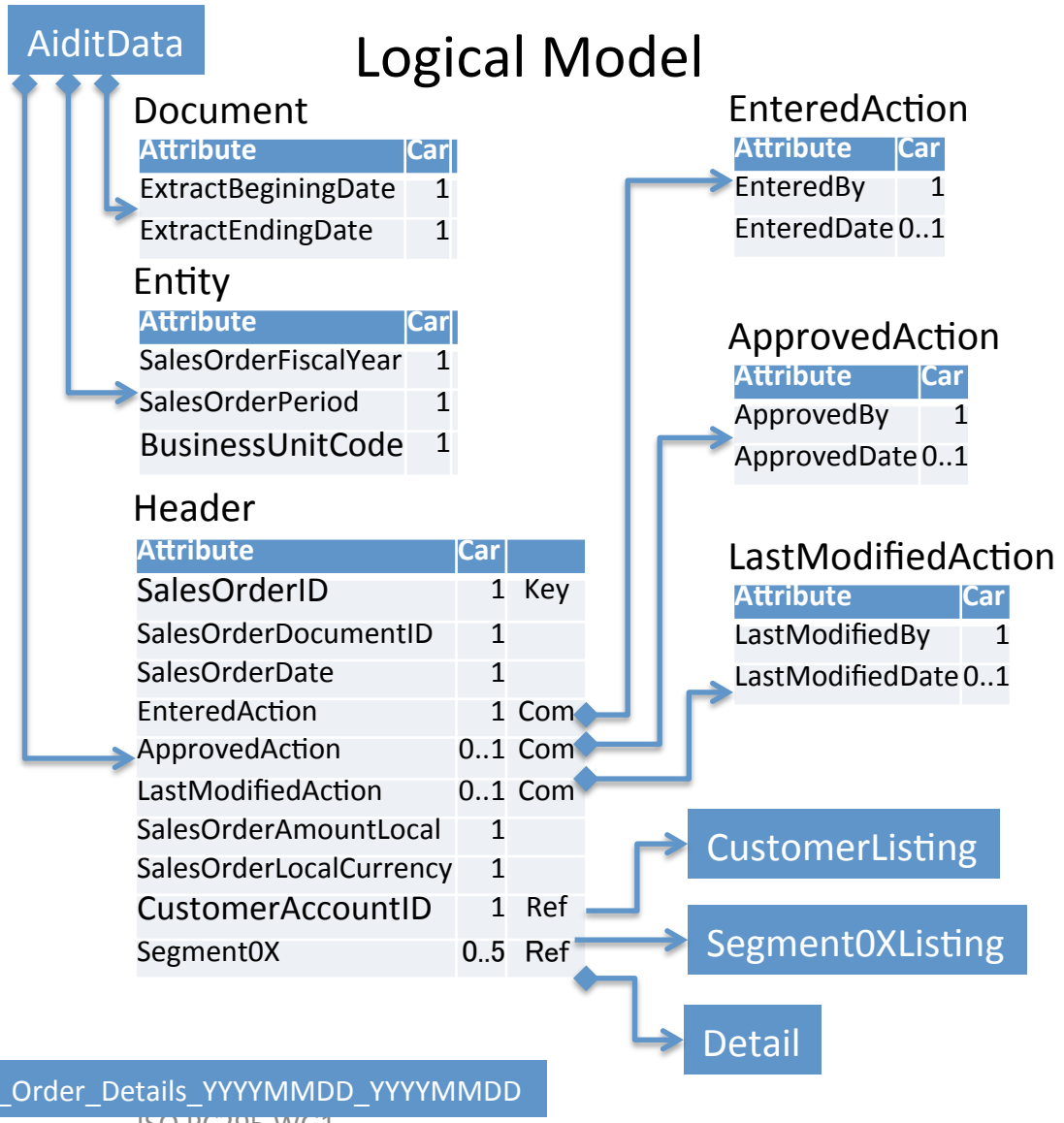
MAPPING ADS TO LOGICAL MODEL AND XBRL GL

Mapping ADS to ADCS Logical Model

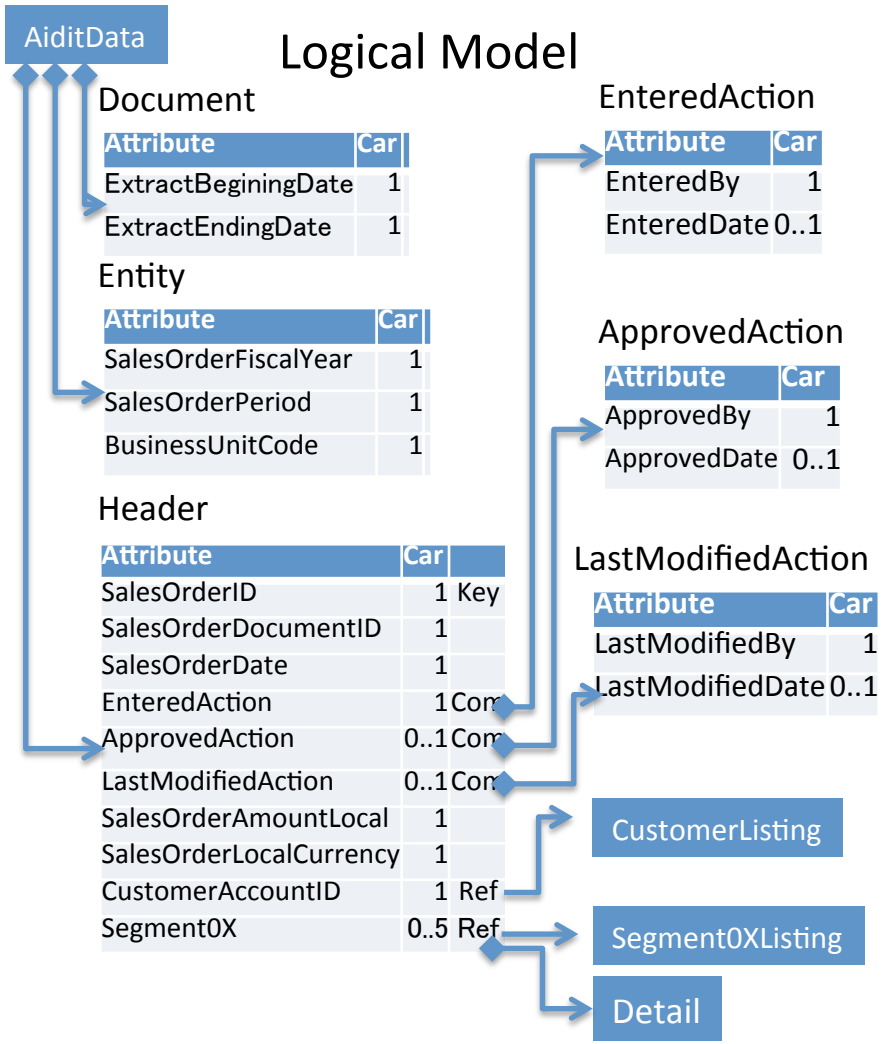
ADS

Sales_Orders_YYYYMMDD_YYYYMMDD

#	Field	Level
1	Sales_Order_ID	1
2	Sales_Order_Document_ID	1
3	Sales_Order_Date	1
4	Sales_Order_Fiscal_Year	1
5	Sales_Order_Period	1
6	Business_Unit_Code	1
7	Customer_Account_ID	1
8	Entered_By	1
9	Entered_Date	2
10	Entered_Time	2
11	Approved_By	2
12	Approved_Date	2
13	Approved_Time	2
14	Last_Modified_By	2
15	Last_Modified_Date	2
16	Last_Modified_Time	2
17	Sales_Order_Amount_Local	1
18	Sales_Order_Local_Currency	1
19	Segment01	2
20	Segment02	2
21	Segment03	2
22	Segment04	2
23	Segment05	2



Mapping ADCS Logical Model to XBRL GL



Logical Model vs. XBRL GL MAPPING

Attribute	Item
ExtractBeginingDate	gl-cor:periodCoveredStart
ExtractEndingDate	gl-cor:periodCoveredEnd
SalesOrderFiscalYear	gl-bus:fiscalYearEnd
SalesOrderPeriod	gl-bus:postingCode
BusinessUnitCode	gl-bus:organizationIdentifier
SalesOrderID	gl-cor:documentReference
SalesOrderDocumentID	gl-cor:documentNumber
SalesOrderDate	gl-cor:documentDate
EnteredBy	gl-cor:identifierCode
EnteredDate	gl-cor:enteredDate
ApprovedBy	gl-cor:entryResponsiblePerson
ApprovedDate	gl-usk:nextDateRepeat
LastModifiedBy	gl-bus:enteredByModified
LastModifiedDate	gl-usk:lastDateRepeat
SalesOrderAmountLocal	gl-muc:amountOriginalAmount
SalesOrderLocalCurrency	gl-muc:amountOriginalCurrency
CustomerAccountID	gl-cor:identifierCode with gl-cor:identifierType = ″customer″
Segment0X	gl-cor:accountSubID with associated gl-cor:accountSubType

XBRL GL item name is UNIQUE within Taxonomy

Resulting XBRL GL