Data Element Example
Employee_Address_Country = 716

Data Element Concept

> Country of Residence

Conceptual Domain

> World Countries
> (Afghanistan, Albania, ..,
> Zimbabwe, etc.)

Data Element

> Employer_Address_Country

> Employee_Address_Country

Value Domain

> Full Names ("AFGHANISTAN",
> "ALBANIA", .., "ZIMBABWE")

> ISO 2-Character Country Codes
> ("AF", "AL", .. "ZW")

> ISO 3-Digit Country Codes:
> ("004", "008", .., "716")

Data Element Model - Definitions

Data Element Concept

A data element concept is "the concept of which data elements form its extension, without reference to a specific value domain."

Conceptual Domain

A conceptual domain is "the concept of which value domains form its extensions, without reference to a specific value domain."

Data Element

A data element is a "fundamental unit of data (that an) organization creates, manages, and disseminates."

Value Domain

A value domain is the "set of permissible (valid) values (for a data element)."

Data Type Model

Data Type Concept

Concept Domain

Data Type

Value Domain

Data Type <Integer> Example
ELEMENT_TYPE = MSB_INTEGER_2_BYTE
Data Engineering View

Data Type Concept

Integer is the mathematical datatype comprising the exact integral values.

Conceptual Domain

Values: Mathematically, the infinite ring produced from the additive identity (0) and the multiplicative identity (1) by requiring 0 = 1 and Add(x,1) ? y for any y = x . That is: ..., -2, -1, 0, 1, 2, ... (a denumerably infinite list). - ISO/IEC 11404

Data Type

Decimal_Integer
   MSB_INTEGER_4_BYTE

Decimal_Integer
   MSB_INTEGER_2_BYTE

Value Domain

See ISO/IEC 11404 Value Syntax. ---e.g. integer-literal = signed-number ; signed-number = ["-"], number ; number = digit-string ;

Data Type Model - Definitions

Data Type Concept

Data Type Concept - A concept that can be represented in the form of a Data Type, described independently of any particular representation.

Conceptual Domain

A Conceptual Domain is a set of Value Meanings, which may either be enumerated or expressed via a description.

Data Type

Data Type – A Basic unit of data of interest to an organization. It is a unit of data for which the definition, identification, representation, and permissible values are specified by means of a set of attributes.

Value Domain

A value domain is the "set of permissible (valid) values (for a data type) or a description."

Data Type Model

1. Class Hierarchy
    *   Data_Type
        *   Binary_Data_Type
            *   Decimal_Integer
                *   MSB_INTEGER_2_BYTE

2. Provider's and Data Engineering View
    *   Element_Type = {MSB_INTEGER_2_BYTE, …}

3. Programmer's View – TBD
    *   MSB_INTEGER_2_BYTE = {data representation at byte/bit level}

*   Data Type Constraints – distributed between Data Type
    and Element Type levels.
    1. Allowed Character Sets
    2. pattern
    3. enumeration
    4. whiteSpace
    5. totalDigits
    6. fractionDigits
    7. maxInclusive
    8. maxExclusive
    9. minInclusive
    10. minExclusive
    11. voids