



Position Paper: Identifier

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Abstract:

This position paper outlines the use and definition of facets within the UBL library content.

Status:

This is V01 of the identifier position paper intended for consideration by the OASIS UBL Naming and Design Rules subcommittee and other interested parties.

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1 Goal

The use of organization-specific names reflects the current situation in many companies. System-dependent identifiers should not be used as a workaround (for example, logical system) because if the technical system landscape changes (for example, due to a change of purchasing system) the "identifiers" also change. This results in considerable administrative work since all (internal and external) "business partners" have to adjust their master data. If, in contrast, system-independent names are used, which take into account the organizational structures within a company, for example, considerably fewer problems arise if the technical system landscape changes. On the implementation side, the "logical system" constructs can be assigned to the organization-specific name of the identification scheme. Identifiers do not then have to be mapped on the "logical system" level, which greatly reduces the administrative effort for major customers with extensive system landscapes. (Note: This proposed assignment of logical systems to organizational identification schemes already exists in a similar form in APO, where the identification scheme is known as a "business system group".)

It should be possible to map any global and proprietary identifiers using the CCT:Identifier. Master data identification requires that both standardized and proprietary identifiers within a message are exchanged. For the most generic approach, the subsequent structure of the ebXML-CCT can be used for the identifier CCT.

The requirements for an identifier are defined in this document based on different use cases. The resulting design of an identifier is then described in detail. The different approaches of standardization bodies are also compared.

General definitions:

Standardized Identifiers:

Standardized identifiers already have globally unique and valid names that are known at implementation time. These names can, therefore, be mapped generally using the attribute "schemeAgencyName" and fixed values in the ERP systems.

Proprietary Identifiers:

Proprietary identifiers are not usually valid generally and are not known at implementation time, meaning that they cannot be mapped using fixed values in the ERP systems. Various specifications enable uniqueness at runtime to be removed. These specifications are detailed in this document.

2 Other Considerations

2.1 Performance

2.1.1 Option 1: Supplementary Components as Attributes

The unique identification of identifier schemes occurs within each identifier element at local level using additional attributes.

Advantages:

- Unique differentiation of standardized and proprietary identifier schemes possible.
- Conformity with the standard.

Disadvantages:

- Low performance, particularly with high data volumes.

2.1.2 Option 2: No Attributes (Role Differentiation)

The role definition contains the information for the unique differentiation of identifier schemes.

Advantages:

- Higher performance, provided that this role also exists on the database side.

Disadvantages:

- Further interpretation of roles necessary.
- Non-conformity with the standard.
- No use of identifier schemes possible.

2.1.3 Option 3: Namespace Extension

Scheme identification is enabled globally using a prefixed namespace. The prefix is placed in front of the relevant identifier element in the local area.

Advantages:

- Higher performance.
- Conformity with the standard.

Disadvantages:

- Considerable implementation effort in IFR required.
- Scheme adaptation is a prerequisite on the customer side.

2.1.4 Option 4: Global Identification of Identifier Schemes

All identifier schemes are uniquely identified in the header of a business document. Referencing occurs using the dictionary entry name.

Advantages:

- Higher performance

Disadvantages:

- Non-conformity with the standard.
- Inconsistent structure (global area does not contain the attributes and local area).
- No automatic validation possible (global information must be stored in the memory and validated using an additional feature).

2.1.5 Recommendation

The first option is recommended provided that only those attributes that are essential for the unique identification of identifier schemes are used (usually only schemeAgency).

A further option must be considered for mass data that is unmanageable. For example, option 2 or the tag names of elements and attributes are shown as unique and short GUIDs.

2.2 Role Description of the Identifier

Looking at a message exchange in isolation, the role can be used as a differentiation criterion, but is only valid if this message is always exchanged between two business partners with the same role function (note: the order is, unfortunately, an example where the current discussion also becomes difficult). In contrast, if a forecast message is considered in a collaboration process, for example, it can be seen that this message can theoretically be sent both from a "buyer" to a "seller" and from a "seller" to a "buyer" (or even to partners with completely different roles, such as "carriers" in the case of transport forecasts). If the role dependency of the identifier were now required, this would lead to a very extensive Customizing logic on the implementation side, in order to firstly define the correct partner role within the active business scenario and then to be able to use this artificial role dependency in the message at the right places. The only way of implementing role-based identifiers without this Customizing overhead would be to use the technical roles "sender" and "recipient" as originally proposed. This would, however, be dismissed due to lack of business reference, a restriction to only two business partners, as well as other problems with replication scenarios, and so on.

An identifier is described with a string and a context. The string is communicated to a tag name in the message using a value. No concatenation of other context attributes occurs for this string.

2.2.1 Different Types of Context

Three different types of context can be defined for an identifier:

- a) Semantic context:
The semantic context is the class (object-oriented) to which the object belongs, which is to be identified.

In the XML document, this is expressed directly in the tag name or in a higher hierarchy level, in accordance with the naming convention (ISO11179).

Example: I) <ProductID>ASD-231</ProductID> (directly in the tag name)
II) <Product> (class in a higher hierarchy level)

```
<ID>ASD-231</ID>
<Name>Driller</Name>
...
</Product>
```

b) Identification scheme:

An identification scheme is the context in which an identifier is unique. In the XML document, the identification scheme is expressed using attributes.

c) Context driver:

Context drivers specify the context in which an object class, for example, is used. This can be the role (BuyerProductId), for example.

2.2.2 Option 1: No Differentiation by Dictionary Entry Name

No differentiation by the dictionary entry name but only by the specification of attributes.

Either the UN/CEFACT code (DE 3055) or the name can be used to represent schemeAgency. The use of the corresponding UN/CEFACT code would, however, be more efficient.

Advantages:

- Smooth transition between registered agency and non-registered agency → facilitates the harmonization of standardization bodies.
- More compact representation of the dictionary entry name or the tag name compiled from it.

Disadvantages:

- No transparency at element level. Differentiation can only be seen with attributes.

2.2.3 Option 2: Differentiation by Dictionary Entry Name

The dictionary entry name contains the additional property qualifier: Standard for standardized identifier schemes and partner for partner-specific or proprietary identifier schemes.

Advantages:

- Improved transparency at element level.
- Better to implement because differentiation can be seen immediately.
- Same use of "Partner" as with RosettaNet.

Disadvantages:

- Additional (redundant) information in the dictionary entry name (overhead).

2.2.4 Option 3: Unique Standard Name in Dictionary Entry Name

The dictionary entry name contains a unique name for the relevant scheme as the object term for standardized identifier schemes. The context driver "System" is used to form the object term.

Advantages:

- Higher performance since no attributes (with the possible exception of schemeVersion) are required for standardized identifier schemes.
- Clear differentiation at element level.
- Same approach as with the namespace concept (see Option 2 under Performance) and therefore easy transition to the namespace concept.

Disadvantages:

- Inconsistency in representation if non-SAP standards are to be used for identifiers on the customer side.
- Unique scheme names required at international level.
- Doubtful whether this proposal will be accepted at international level.

2.2.5 Recommendation

The third option is recommended if consistency is universally guaranteed and this proposal is accepted at international level (UBL, UN/CEFACT). It is important that not all attributes of standardized identifiers (with the possible exception of Version) are represented.

Option 3 can also be used, for example, as a temporary solution for the namespace solution. This means that mapping between the tag name of option 3 and the prefixed tag name of the namespace solution also has to occur.

If the third option is not acceptable, option 1 is preferred. This solution is homogeneous with the standard. Furthermore, differentiation can be seen between the standardized and proprietary identifiers from the attributes. More differentiation means more redundancy in the representation of the instances.

2.3 Representation of Proprietary Identifiers

2.3.1 Role using DE 3055

```
schemeAgencyId = 92 (Role Buyer from DE3055)
schemeId = "Household devices"
```

Advantages:

- Mappability for existing documents/interfaces is specified with the roles.

Disadvantages:

- schemeAgencyId is used for different aspects, such as role (for example, Buyer) and actual organization (for example, Dun & Bradstreet).

- Only possible if the role does not change.
- Agreement on schemeld required.

2.3.2 Bilaterally-Defined Name for the Agency

```

schemeAgencyId = http://www.bosch.com (or schemeAgencyId =
"Bosch")
schemeId = "Household devices"

```

Disadvantages:

- The business partners must agree on the schemeAgencyIds and schemelds (agreement required).
- schemeAgencyId has either the value DE3055 or an individually assigned content. How do you know which is the case?

2.3.3 Specification of a URI

```

schemeURI = http://www.bosch.com/Haushaltsgeraete

```

Advantages:

- schemeURI is unique by definition.

Disadvantages:

- Agreement on schemeURI required.

2.3.4 Two-Level Process for Interpretation of schemeAgencyId

```

schemeAgencyId = „ABC123“ (D & B - Number for the business
partner)
agencySchemeAgencyId = 16 (code from DE3055 for D & B)
schemeId = "Household devices"

```

Disadvantages:

- Agreement on schemeld required.
- The content of schemeAgencyId only becomes clear with agencySchemeAgencyId (attribute is used as a "container" with the most diverse content).

	Standard	Prop. 1	Prop. 2	Prop. 3
schemeAgencyId	16 (-> D&B)	92 (-> Role from DE3055)	ABC123 (Business Partner Id of D&B)	Bosch
agencySchemeAgencyId	- (DE3055 is the default)	- (DE3055 is the default value)	16 (D&B from DE3055)	ZZZ (mutually defined)

	value)			
schemeld	Id of the scheme of D&B	Household devices	Household devices	Household devices

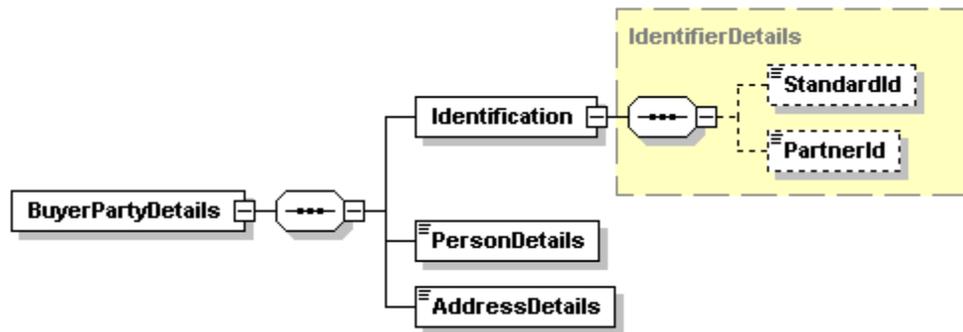
2.4 Physical Structure

If the proprietary and standardized identifiers of an object are to be represented as separate data elements, they are grouped together by a container. There are three options for container representation.

2.4.1 Option 1: ComplexType as Container

The container is formed with a complex data type (for example, IdentifierDetails). This complex data type has a "sequence" of both child elements for the representation of standardized (StandardId) and proprietary (PartnerId) identifiers.

See the following graphic:



The instance:

```
<BuyerPartyDetails>
  <Identification>
    <StandardId>123456789</StandardId>
    <PartnerId>ABCDEFGH</PartnerId>
  </Identification>
  <PersonDetails>String</PersonDetails>
  <AddressDetails>String</AddressDetails>
</BuyerPartyDetails>
```

Advantages:

- Can be mapped using the current IFR (because at present only a sequence and a reference to a complexType or simpleType is possible).
- Both identifier values are always grouped together using the complex data type.
- With XPath version 1.0, all different identifier values can be returned with the specification of the LocationPath "Identification".

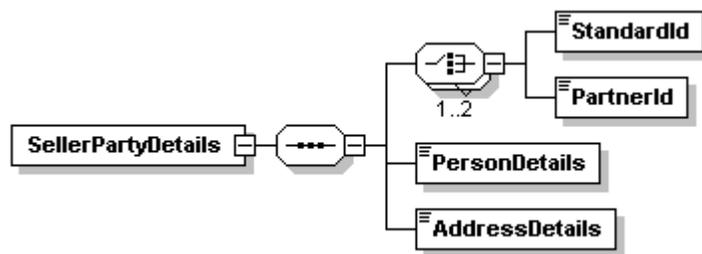
Disadvantages:

- Generation of an unnecessarily high data volume (not efficient). This subdivision is superfluous, particularly if only one identifier is to be instantiated.
- Formation of another, unnecessary hierarchy.
- Additional name assignment for a container that is represented as a complex data type.
- Does not correspond to the object-oriented representation and the relational database structure. This is due to the fact that each class (in this case, "BuyerParty") should have a unique ID because of identification for the inheritance and formation of relations. BuyerParty would be a class without a unique ID because, in accordance with the standard, it is not in the same class but rather in a subclass.

2.4.2 Option 2: Implicit Container as Choice

The container with a choice of standardized or proprietary identifier is represented implicitly in each aggregation. No additional element group is defined for the container itself. The container consists exclusively of a "Choice".

Scheme structure



The instance:

```
<SellerPartyDetails>
  <StandardId>123456789</StandardId>
  <PartnerId>ABCDEFGH</PartnerId>
  <PersonDetails>String</PersonDetails>
  <AddressDetails>String</AddressDetails>
</SellerPartyDetails>
```

Advantages:

- Can be mapped using the current IFR if a "sequence" rather than a "choice" is used.
- Saves an additional element group and therefore also additional volume and hierarchy → more efficient and clearer.
- Corresponds to the idea of an optimal object-oriented representation and a relational database structure.
- Represents perfectly the convention from Option 3: Unique Standard Name in Dictionary Entry Name in Unit 2.2.4.

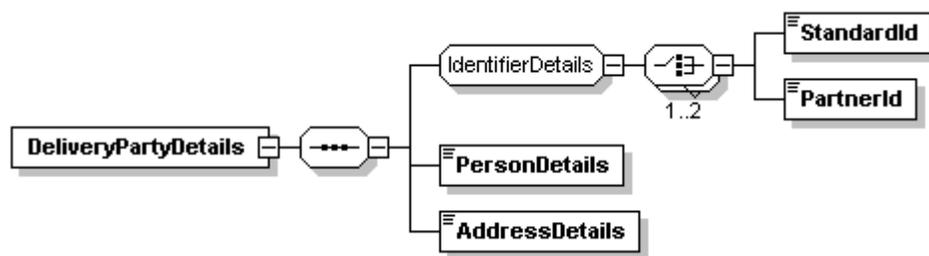
Disadvantages:

- Means that the modeler must make sure that they manually create an aggregation with a container in accordance with the specifications.
- With XPath version 1.0, the group of identifiers cannot be selected so easily.

2.4.3 Option 3: Group as Container

The container with a choice of standardized or proprietary identifier is defined as a global group (IdentifierDetails). This group consists of a "choice" and two elements "StandardId" and "PartnerId". A group can be referenced directly within an aggregation. This means that only the content of the group within the aggregation is represented.

Scheme structure:



The instance:

```
<DeliveryPartyDetails>
  <StandardId>123456789</StandardId>
  <PartnerId>ABCDEFGH</PartnerId>
  <PersonDetails>String</PersonDetails>
  <AddressDetails>String</AddressDetails>
</DeliveryPartyDetails>
```

Advantages:

- Saves an additional element group and therefore also additional volume and hierarchy
→ more efficient and clearer.
- Corresponds to the idea of an optimal object-oriented representation and a relational database structure.
- The container for standardized and proprietary identifiers is predefined through the global group.

Disadvantages:

- With XPath version 1.0, the group of identifiers cannot be selected so easily.
- Cannot be mapped using the current IFR because the IFR does not permit any global groups.
- Cannot therefore represent the convention from Option 3: Unique Standard Name in Dictionary Entry Name in Unit 2.2.4.

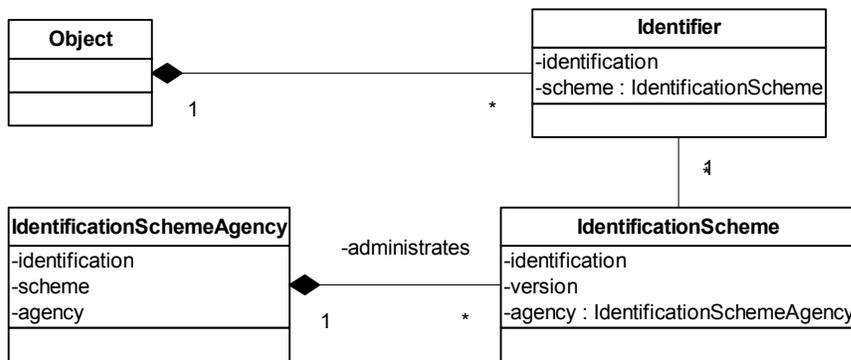
2.4.4 Recommendation

If proprietary and standardized identifiers are to be mapped using Option 3: Unique Standard Name in Dictionary Entry Name, option 2 is recommended. This ensures that every standardized identifier receives its own dictionary entry name.

If proprietary and standardized identifiers are to be represented using another option, option 3 is recommended. It guarantees less implementation effort and fewer sources of error for the definition of aggregations.

3 Recommendation: Identifier Structure

The identifier is created based on the following object model:



The design of the identifier must therefore meet the following requirements:

- There are multiple identifiers for one object
- An identifier is unique within a predefined context

To cover these requirements, the following attributes need to be considered:

CCT	Category	Object Class	Property Term	Representation Term	Datatype	Cardinality	Remarks
Identifier	complexType	Identifier	Identifier	Content	xsd:token		
	schemeId	IdentificationScheme	Identification	Identifier	xsd:token	0..1	Optional
	schemeVersionId	IdentificationScheme	Version	Identifier	xsd:token	0..1	Optional
	schemeAgencyId	IdentificationSchemeAgency	Identification	Identifier	xsd:token	0..1	Optional

	schemeAgency-SchemeId	Attribute	IdentificationScheme-Agency	Scheme	Identifier	xsd:token	0..1	Optional,
	schemeAgency-SchemeAgencyId	Attribute	IdentificationScheme-Agency	SchemeAgency	Identifier	xsd:token	0..1	Optional

3.1 Attributes (Integrity/Domain)

- **SchemelId** identifies an identification scheme. The identification scheme represents the context used to identify an object. SchemelId is only unique within the agency that administrates this identification scheme.
- **SchemeVersionId** identifies the version of this identification scheme.
- **SchemeAgencyId** identifies the agency that administrates an identification scheme. The agencies from DE 3055 are used as the default, whereby the roles defined in DE 3055 cannot be used.
- **SchemeAgencySchemelId** identifies the identification scheme that represents the context for identifying the agency.
- **SchemeAgencySchemeAgencyId** identifies the agency that administrates the SchemeAgencySchemelId. This attribute can only contain values from DE 3055 (without roles).

3.2 Representation of the XML Instance

a) Standard Identifier/ Standard Agency:

```
<ProductId schemeId ="GTIN" schemeAgencyId="113">10614141000415</
ProductId>
```

b) Proprietary Identifier/ Standard Agency:

```
<ProductId schemeId ="Household devices"
schemeAgencyId="065055766" schemeAgencySchemeId="DUNS"
schemeAgencyAgencyId="016">123</ ProductId>
```

c) Proprietary Identifier/ Proprietary Agency:

```
<ProductId schemeId ="Household devices" schemeAgencyId="4711"
schemeAgencySchemeId="PartyA" schemeAgencyAgencyId="ZZZ">456</
ProductId>
```

3.3 Use

The data type identifier is used for all elements or attributes that are to enable unique identification of logical or real objects in communication between partners or systems. The number of attributes is not to be "limited" but rather should increase continually (such as with ProductId, OrderId, and so on). More and more IDs are added.

If the agency administrating the identification scheme is not named explicitly but rather specified using a role, this occurs in the tag name.

The following types of identifier can be mapped:

a.) Standardized identifiers whose identification schemes are administrated by an agency from the code list DE 3055.

Identifier	Standard
schemeld	Identification scheme for the standard identifier
schemeVersionId	Version of the identification scheme
schemeAgencyId	Agency from DE 3055 (without roles)
schemeAgencySchemeld	-
schemeAgencySchemeAgencyId	-

b.) Proprietary identifiers whose identification schemes are administrated by an agency that is identified using a standard.

Identifier	Proprietary
schemeld	Identification scheme for the proprietary identifier
schemeVersionId	Version of the identification scheme
schemeAgencyId	Standardized Id for the agency (usually the company that administrates the proprietary identifier)
schemeAgencySchemeld	Identification scheme for the schemeAgencyId
schemeAgencySchemeAgencyId	Agency from DE 3055 that administrates the standardized Id "schemeAgencyId"

c.) Proprietary identifiers whose identification schemes are administrated by an agency that is identified proprietarily.

Identifier	Proprietary
schemeld	Identification scheme for the proprietary identifier
schemeVersionId	Version of the identification scheme
schemeAgencyId	Proprietary Id for the agency (usually the company that administrates the proprietary identifier)
schemeAgencySchemeld	Identification scheme for the schemeAgencyId
schemeAgencySchemeAgencyId	"ZZZ" (mutually defined from DE 3055)

d.) Proprietary identifiers whose identification schemes are administrated by an agency that is specified either using a role or not at all.
 The role is specified as a prefix in the tag name. Schemeld and schemeVersionId can be used as attributes if there is more than one identification scheme. If there is only one identification scheme, no attributes are required.

Identifier	Proprietary
schemeld	Identification scheme for the proprietary identifier

schemeVersionId	Version of the identification scheme
schemeAgencyId	-
schemeAgencySchemeId	-
schemeAgencySchemeAgencyId	-

Appendix A. Notes

The different definitions of an identifier in standardization bodies are outlined in the following.

3.4 UN/CEFACT CCTS

3.4.1 Version 1.8

CCT Dictionary Entry Name	Definition	CCT Components	CCT Components Definition
Identifier. Type	A character string to identify and distinguish uniquely, one instance of an object in an identification scheme from all other objects in the same scheme together with relevant supplementary information.	Identifier. Content (000102)	A character string to identify and distinguish uniquely, one instance of an object in an identification scheme from all other objects in the same scheme
		Identification Scheme. Name (000103)	The name of the identification scheme.
		Identification Scheme Agency. Name (000104)	The agency that maintains the identification scheme.
		Language.Code (000075)	The identifier of the language used in the corresponding text string
		Identification Scheme Data. Uniform Resource. Identifier (000209)	The Uniform Resource Identifier that identifies where the Identification Scheme Data is located
		Identification Scheme. Uniform Resource. Identifier	The Uniform Resource Identifier that identifies where the Identification Scheme is located

3.4.2 Version 1.85 (Draft)

CCT Dictionary Entry Name	Definition	CCT Components	CCT Components Definition
Identifier. Type	A character string to identify and distinguish uniquely, one instance of an object in an	Identifier. Content	A character string to identify and distinguish uniquely, one instance of an object in an identification scheme from all other objects in the same scheme
		Identification Scheme. Identifier	The identification of the identification scheme.

identification scheme from all other objects in the same scheme together with relevant supplementary information.	Identification Scheme. Name. Text	The name of the identification scheme.
	Identification Scheme Agency. Identifier	The identification of the agency that maintains the identification scheme. (Defaults to the UN/EDIFACT data element 3055 code list.)
	Identification Scheme Agency. Name. Text	The name of the agency that maintains the identification scheme
	Identification Scheme. Version. Identifier	The version of the identification scheme. (Identifies the version of the UN/EDIFACT data element 3055 code list.)
	Identification Scheme Data. Uniform Resource. Identifier	The Uniform Resource Identifier that identifies where the Identification Scheme Data is located
	Identification Scheme. Uniform Resource. Identifier	The Uniform Resource Identifier that identifies where the Identification Scheme is located

3.5 HR-XML

Structure		Category	Card.	Type	Definition
EntityIdType		complexType			
	IdValue	element	1..*	xsd:string	A sequence of characters that one or more systems use as an identifier for the given entity. This could be numeric, alpha, and may include punctuation.
		name attribute	0..1	xsd:string	A description of the type of identifier or the portion of an identifier that 'IdValue' represents. If used, values should be determined by trading partner agreement.
	validFrom	attribute	0..1		
	validTo	attribute	0..1		
	idOwner	attribute	0..1	xsd:string	A description of who 'owns' the identifier. This usually will be the company and/or system name that utilizes the given value(s) for uniqueness. Use should be by trading partner agreement.

Examples:

<pre><PersonId> <IdValue>113355</IdValue> </PersonId></pre>	<p>Simple identifiers: company A -> company B, 113355 is the Id in company A</p>
<pre><PersonId idOwner="A"> <IdValue>113355</IdValue> </PersonId> <PersonId idOwner="B"> <IdValue>MA237</IdValue> </PersonId></pre>	<p>Multiple Identifiers: company A -> company B -> company C</p>
<pre><PersonId> <IdValue name="Employee Id">113355</IdValue> <IdValue name="Division">Corporate</IdValue> </PersonId></pre>	<p>Multiple part identifiers</p>
<pre><PersonId validFrom="1900-01-01" validTo="2000-07-31"> <IdValue name="Employee Id">113355</IdValue> <IdValue name="Division">Corporate</IdValue> </PersonId> <PersonId validFrom="2000-08-01" validTo="2999-12-31"> <IdValue name="Employee Id">2221001</IdValue> <IdValue name="Division">GearTech</IdValue> </PersonId></pre>	<p>Dated identifiers</p>

3.6 XBRL

XBRL.ORG is developing the eXtensible Business Reporting Language (XBRL) for the preparation and exchange of business reports and data. The initial goal of XBRL is to provide an XML-based framework that the global business information supply chain will use to create, exchange, and analyze financial reporting information including, but not limited to, regulatory filings such as annual and quarterly financial statements, general ledger information, and audit schedules.

3.6.1 Identifiers with XBRL

An identifier element specifies a system for identifying business entities. The scheme attribute contains the namespace URI of the identification scheme, providing a framework for referencing naming authorities. The element content shall be a [string](#) that is a valid identifier within the namespace referenced by the scheme attribute. XBRL.org is not a naming authority for business entities. XBRL makes no assumption about the ability of an application to resolve an identifier that may appear as element content in any particular scheme.

Example	Meaning
<pre><identifier scheme="">SAMP</identifier></pre>	<p>Some entity known only as SAMP within the default namespace.</p>
<pre><identifier</pre>	<p>The company with NASDAQ ticker symbol SAMP.</p>

<code><identifier scheme="www.nasdaq.com">SAMP</identifier></code>	
<code><identifier scheme="www.dnb.com">0236503276</identifier></code>	The company or subsidiary with number 0236503276 (not a real D-U-N-S® number).
<code><identifier scheme="www.cusip.org">41009876AB</identifier></code>	The entity with CUSIP number 41009876AB (e.g. a mutual fund).
<code><identifier scheme="www.ietf.org/URI">www.w3c.org</identifier></code>	The non-profit organization owning the URI www.w3c.org.

3.7 PapiNet

The purpose of papiNet is to develop, maintain and support the implementation of global electronic business transaction standards for parties engaged in the buying, selling, and distribution of forest and paper products. The aim is to improve the reach and richness of communication throughout the supply chain, increase efficiencies in transactions and marketplace activities, and to support interoperability among trading partners. The papiNet standards are open and freely available.

3.7.1 Identifiers with PapiNet

Structure		Category	Card.	Type	Definition
ProductIdentifier		complexType		xsd:string ??	A field used to communicate the code of the article, in a variety of formats designated by the type.

Appendix B. Notes

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4 Appendix B

4.1 Bibliography

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