e-SLOG 2.0

Electronic invoice

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English version

e-SLOG 2.0 Electronic Invoice – Part 1: General Instructions

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Foreword

The e-SLOG 2.0 Electronic Invoice documentation was prepared by the ROSE "Readiness Of Slovenian E-Invoicing" project.

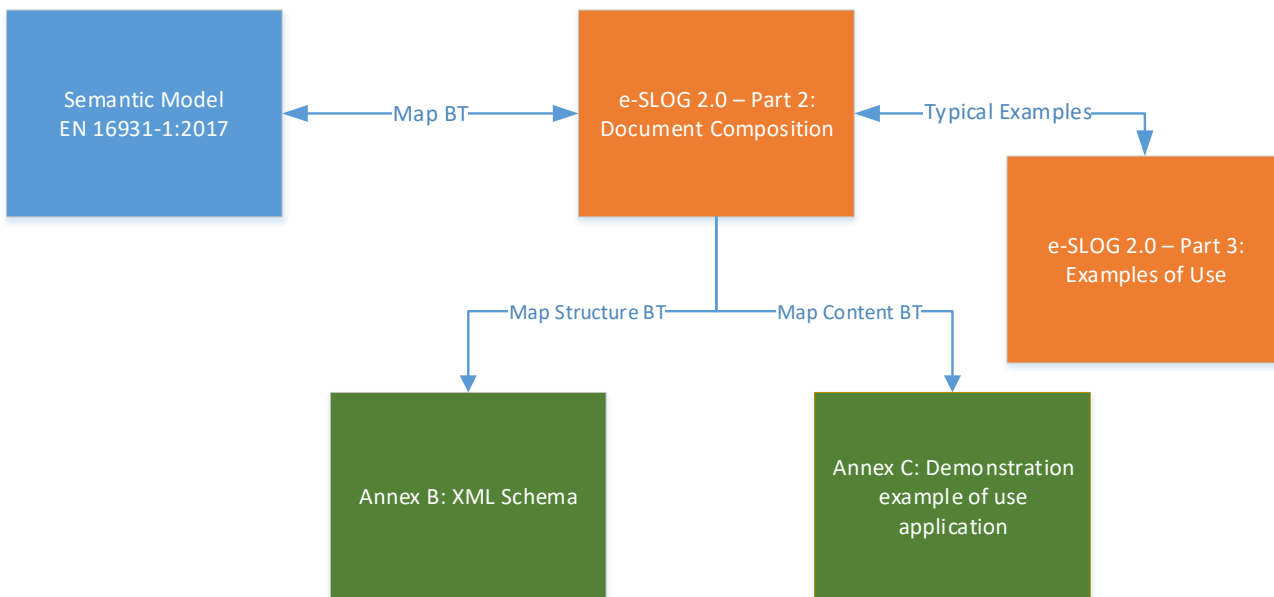This document is part of a group of documents, consisting of:

- e-SLOG 2.0 Electronic Invoice – Part 1: General Instructions

- e-SLOG 2.0 Electronic Invoice – Part 2: Document Composition

- e-SLOG 2.0 Electronic Invoice – Part 3: Examples of Use

Figure 1: Link between the e-SLOG 2.0 electronic invoice documents

Introduction

On 6 May 2014, the European Parliament and the Council adopted Directive 2014/55/EU on establishing the EN 16931 electronic invoicing standard. The European standard was published in the Official Journal of the European Union on 17 October 2017.

The ROSE "Readiness Of Slovenian E-invoicing" measure was established in order to introduce the European electronic invoicing standard in the Slovenian public sector and in the economy. One of the fundamental objectives of the measure is to upgrade the e-SLOG standard to the 2.0 version, which is in line with the European standard. In the preparation of the e-SLOG 2.0 standard, UN/EDIFACT INVOIC syntax was used as a basis, the same as in the preparation of the previous e-SLOG standard versions.

Interoperability between the old e-SLOG 1.6 standard and the new e-SLOG 2.0 standard is provided by mapping tables, which enable mapping between the two standards. The mapping tables can be found in Annex D to the document *e-SLOG 2.0 Electronic Invoice – Part 2: Document Composition*.

1 Scope

The purpose of the document is to provide guidelines for the understanding and implementing the e-SLOG 2.0 standard – Electronic invoice and its placement in the context of the semantic model described in SIST EN 16931-1:2017 [2]. It is intended for all legal and public persons sending or wishing to send their invoices in electronic form.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

SIST EN 16931-1:2017 Electronic Invoicing – Part 1: Semantic data model of the core elements of an electronic invoice.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
Electronic invoice
An invoice that has been issued, transmitted and received in a structured electronic format which allows for its automatic and electronic processing.

[Source: Directive 2014/55/EU [1]]

3.2
Semantic data model
A structured set of logically interrelated information elements.

3.3
Information element
A semantic concept that can be defined independently from any presentation in a syntax.

3.4
Structured information element
An information element that can be processed automatically.

3.5
Syntax
Machine-readable language or dialect used to represent the information elements contained in an electronic document (e.g. an electronic invoice).

3.6
Business term – BT
A label assigned to a given information element that is used as a primary reference.

3.7
Business terms group – BG
Groups that combine two or more business terms in content.

3.8
Core invoice model
A semantic data model of the core elements of an electronic invoice.

3.9
Core elements of an electronic invoice
A set of essential information elements that an electronic invoice may contain in order to enable cross-border interoperability, including the necessary information to ensure legal compliance.

3.10
Segments
Data carriers in business terms.

3.11
Message structure
Segments presented in a sequence.

3.12
Branching diagram
The hierarchical display of segments.

4   EN 16931-1 Standard

The SIST EN 16931-1:2017 standard defines the semantic model of the core elements of an electronic invoice (hereinafter: semantic model). The core elements of an electronic invoice are the ones that ensure legal compliance and enable interoperability for cross-border, cross-sector and for domestic trade. The semantic model is essentially targeted at organizations in the private and the public sector for public procurement invoicing. The semantic model may also be used for invoicing between private sector enterprises.

The following guiding principles apply for the use of the semantic model:

- It should be easier to prepare, send, receive and process electronic invoices in comparison to paper invoices.

- The use of standardized information elements should make electronic invoice processing simpler than processing paper invoices.

- Compliance of an invoice with the semantic model should mean that business partners should be able to understand the electronic invoice (at the semantic level) without prior consultation or bilateral agreements.

- Invoices should be composed of structured data in order to enable the conditions for automatic processing.

- Electronic invoice processing software should be able to present (display) all information elements in the semantic model and automatically process all structured data.

- The use of structured data should result in optimized business processes.

- The semantic model makes no assumption about the method by which an invoice is created, delivered and processed. The invoice may be exchanged directly between business partners or exchanged using an e-invoicing intermediary service provider.

- The semantic model makes no assumption about the syntax or transmission technology used. Senders and receivers of e-invoices shall ensure the authenticity and integrity of the invoice according to relevant regulations.

The invoices according to the semantic model include information to support the following processes:

- Accounting

- Verifying the invoice with regard to the contract, order and delivery of goods and services

- VAT Reporting

- Auditing

- Payment

5 e-SLOG 2.0 – Electronic invoice

5.1 e-SLOG Standard

In 2001, the Chamber of Commerce and Industry of Slovenia initiated the e-SLOG project "Elektronsko poslovanje slovenskega gospodarstva" (Electronic Commerce in the Slovene Economy) on the initiative of companies. The project involved experts from more than 90 companies with the aim of preparing and implementing the standards for e-commerce of companies including order forms, delivery notes and invoices in the XML format. The standards e-SLOG 1.3 were published within the e-SLOG project and started to be used for commerce after the year 2003. The companies that apply mass invoicing were the first to use the e-invoicing: communication operators, energy companies and commercial chains. After the year 2005, e-SLOG 1.5 e-invoicing was massively adopted also by other companies in Slovenia. Based on the practical experience gained from the use of e-invoices, we have been updating the e-invoicing standard in Slovenia. The most recent version currently in use is e-SLOG 1.6.1, which was developed in 2015, when we added the parameters for fiscal validation of the invoices into the standard.

5.2 Semantic compliance with EN 16931-1

e-SLOG 2.0 - Electronic Invoice (hereinafter: e-SLOG 2.0) complies with the SIST EN 16931-1:2017 standard and consequently with the semantic model defined by the standard. This means that e-SLOG 2.0 supports all the data and functionalities defined in the semantic model.

5.3 e-SLOG 2.0 syntax

e-SLOG 2.0 is based on the EDIFACT INVOIC D01B standard and converted to XML format according to the ISO/TS 20625:2002 Standard – Rules for generation of XML schema files (XSD) on the basis of EDI(FACT) implementation guidelines with additional optimizations that enable even more efficient use of the schema.

ASSUMPTION: According to the detected practices in e-commerce, the EDIFACT format is among the most commonly used in the purchase of goods or services in the European market. This includes electronic documents such as: order (ORDERS), purchase order response (ORDRSP), despatch advice (DESADV), receiving advice (RECADV), etc. The implementation of the e-SLOG 2.0 invoice is also the basis for the implementation of other types of documents in the purchase process. Due to the compatibility of the e-SLOG 2.0 standard with EDIFACT, the integration between Slovene and foreign companies will be simpler and more efficient.

5.4 Changes with regard to the ISO/TS 20625:2002

5.4.1 Code lists

The semantic model defines code lists that are maintained by different organizations and are largely independent of the syntax used. Code lists may be subject to change or update (unit of measurement, state, currency code list, etc.). Any change in the code list would constitute a new version of the schema, which could lead to inconsistencies between the schemas used by organizations and to demanding

maintenance of the software. Because of the listed risks, the code lists are not a part of the e-SLOG 2.0 schema.

5.4.2 Definition of decimal numbers

According to the ISO/TS 20625:2002 standard, comma (,) or point (.) can be used as decimal separator. Decimal numbers (amounts, prices, quantities, etc.) do not have a limited number of decimal places. Therefore, the interpretation of decimal numbers could be ineffective. Because of the listed risks, the e-SLOG 2.0 schema only allows point (.) as a decimal separator.

5.4.3 Definition of date fields

The date field format in the EDIFACT standard is determined by the code that sets out the way in which date fields are represented.

EXAMPLE: 102: CCYYMMDD
          204: CCYYMMDDHHMMSS

The semantic model defines the Date type that does not include the time of day. In order to simplify the date field representation, the XML schema uses the type xsd:date.

5.4.4 Extension of field length

In the EDIFACT standard, each field is limited by length. In order to meet the needs of the semantic model and compatibility with EDIFACT D16B, the following fields are extended:

- D_1004 from 35 to 70 characters

- D_3036 from 35 to 70 characters

- D_3412 from 35 to 256 characters

- D_6411 from 3 to 8 characters

5.4.5 Added electronic signature

The semantic model neither requires nor prohibits the use of an electronic signature. An electronic signature is a tool that can guarantee the authenticity and integrity of the invoice. Like the semantic model, e-SLOG 2.0 also does not prescribe the mandatory use of an electronic signature. Based on the characteristics of an electronically signed document, it is recommended to use an electronic signature in e-SLOG 2.0.

5.5 Electronic signature

An XML electronic signature schema (xmldsig-core-schema.xsd) is added to the e-SLOG XML schema. The XML electronic signature schema enables basic electronic signing (xmldsig) and advanced electronic signing (XAdES).

The XML electronic signature schema is the same as the schema published on the W3C[1] website. Due to the increasing length of certificates serial numbers issued by certification-service-providers, it is recommended[2] to use a local copy of the schema for the validation of the X509IssuerSerial element, whereby the X509SerialNumber element is converted from Integer to String.

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[1] https://www.w3.org/TR/xmldsig-core/xmldsig-core-schema.xsd
[2] https://www.w3.org/TR/xmldsig-core2/

The schema enables two types of signatures: "Enveloped" and "Detached".

For "Detached" signatures, the e-SLOG schema XML node M_INVOIC has an added optional attribute Id=data, which also allows for compatibility with the electronic signature type from the e-SLOG 1.6.1.

6 Semantic model mapping in e-SLOG 2.0

6.1 Business terms (GT) and business terms groups (BG)

The semantic model as the information carrier defines business terms (BT). Business terms groups (BG) are groups that link two or more business terms in content. To simplify mapping, the business terms will hereinafter be labelled with BT and business terms groups will be labelled as BG wherever reasonable. A list and description of business terms (BT) can be found in Appendix A to the document *e-SLOG 2.0 Electronic Invoice – Document Composition*.

NOTE: Business terms groups (BG) only link the individual business terms in content. Business terms groups do NOT contain data.

6.2 Cardinalities

The semantic model defines four different types of cardinality. This is a property of business terms and business terms groups.

1..1   Mandatory information that must always be present and may occur only once.

EXAMPLE: BT-1: A unique invoice number must be present in each invoice.

1..n   Mandatory information that must always be present and may occur repeatedly.

EXAMPLE: BG-25: Each invoice must have at least one item, but can also have more.

0..1   Any information which may appear no more than once.

EXAMPLE: BT-132: An item in the invoice can have a written reference to the row number in the order. The reference may only link to one row in the order and may only appear once. The information may be of any kind. It is therefore in line with the semantic model, even if it is not present in the invoice.

0..n   Any information which may appear more than once.

EXAMPLE: BG-27: We can enter one or more discounts for an individual invoice item. An item may also be without discounts.

If cardinality n (optional number of repetitions) is indicated in the business term or group, it does not mean that the number of repetitions is optional. The XML schema sets out the maximum number of repetitions. The limitations in the XML schema are also necessary in order for the invoice to remain consistent with other international standards (EDIFACT) that the e-SLOG 2.0 is based on.

EXAMPLE:BG-25 with cardinality 1..n specifies that every invoice must have at least one item, while the total number of items is optional. In the XML schema of an e-SLOG 2.0 invoice, the maximum permitted number of repetitions is 9999999.

As evident from the example above, the repetitions are limited to a specific number, but the value is such that it should satisfy all the needs in practice.

6.3   Data Types

The semantic model defines the following data types:

- Amount
- Price per Unit
- Quantity
- Percentage
- Identifier
- Reference to document
- Code
- Date
- Text
- Binary object

Field limitations in the XML schema are not the same as those specified by the semantic model. At the same time, the limitations in the XML schema do not in any way limit the content of the fields in a way that would disable a semantically correct input. The data types in the semantic model always have priority over the data types in the XML schema.

EXAMPLE: In the semantic model, BT-106 contains the total amount of all the invoice items and is of the type *Amount.* Two (2) decimal places are allowed for the said business term. The XML schema allows a maximum number of six (6) decimal places for the field D_5004. Although the XML schema indicates that the maximum number of decimal places is six (6), the maximum number of decimal places in the BT-106 field is two (2).

6.4   Code lists

Code lists are not a part of the XML schema. Due to frequent changes in the code lists, the harmonisation of such XML schemas would be demanding and ineffective. The semantic model defines the use of clearly specified code lists in advance. Using the same code lists in different standards enables simpler mapping between different standards. Use of code lists is recorded in the document *e-SLOG 2.0 Electronic Invoice – Part 2: Document Composition* according to the recommendations of the EDIFACT D16B standard mapping in the semantic model.

EXAMPLE: BT-159: The code identifying the country from which the item originates.

In the semantic model it is written that the code list is obtained from EN ISO 3166-1. Since the e-SLOG documentation does not specify the code list, the code list from the semantic model is used.

EXAMPLE: BT-157-1: Item standard identifier identification schema identifier (BT-157-1).

The e-SLOG 2.0 documentation states that the list of organizations that issued the item code is derived from the UN code list 7143. E.g. SRV is a code for GS1 that issues GTIN numbers. This code list satisfies the needs of the semantic model, therefore the code list written in the e-SLOG 2.0. is used.

6.5   Attachments

Attachments to invoices (specifications, visualizations, images and other documents) are not part of the XML document and are specifically transmitted in the envelope of the document. Envelopes are not defined in the e-SLOG 2.0 standard and are subject to an individual company or an intermediary for the exchange of electronic documents. Despite the above, it is assumed that for the purpose of processing of the attachments, the envelope contains information that enables BG-24 mapping (Additional Supporting Documents) from the semantic model.

BG-24 includes:

- BT-122: Supporting document reference

- BT-123: Supporting document description

- BT-124: External document location

- BT-125: Attached document

7   Instructions for understanding the e-SLOG 2.0 documentation

7.1   General instructions

The e-SLOG 2.0 documentation is written on the basis of the data from the example of use **A.6 Maximum content** specified in the document **SIST-TS CEN/TS 16931-3-4:2018, Electronic invoicing – Part 3-4: Syntax binding for UN/EDIFACT INVOIC D16B**. The example of use illustrates an invoice that uses all business terms and not an actual practical case. In practice, an invoice will mostly contain less business terms.

7.2   Obligation to enter segments and elements (M, R, C)

The obligation to enter an individual segment or element is established according to the designations M (mandatory), R (required) and C (conditional). e-SLOG 2.0 was built on the basis of the semantic model, so basically everything that is mandatory in the semantic model is also mandatory in e-SLOG 2.0.

NOTE: The manual shows three (3) items for better understanding. Every invoice must contain at least one item. The first item in the documentation is listed as mandatory and the others items aimed at better understanding are listed as conditional.

    M (mandatory) The designation M indicates all segments and elements whose mandatory input is defined in the EDIFACT standard.

    R (required)   The designation R indicates all segments and elements whose input was subsequently marked as mandatory.

    C (conditional) The designation R indicates all segments and elements whose input is conditional.

The invoice issuer must ensure that all statutory conditions are met when the invoice is issued and also follow the instructions from the semantic model.

7.3   Composition of the manual

The document *e-SLOG 2.0 Electronic Invoice – Part 2: Document Composition* consists of three chapters, which jointly provide insight into the structure and content of the document. It is in the format that is most common in the world of electronic commerce. The manual covers all the segments and elements defined as data carriers in business terms.

Message structure   Segments presented in a sequence

Branching diagram   Hierarchical display of segments

Segments   Detailed data for individual segments

7.3.1   Message structure

Segments are presented in a sequence. The following information can be obtained from the composition:

1) Segment code

2) Obligation to enter segment

3) Relationship with the parent segment

4) Number of repetitions

5) Serial number of segment in documentation
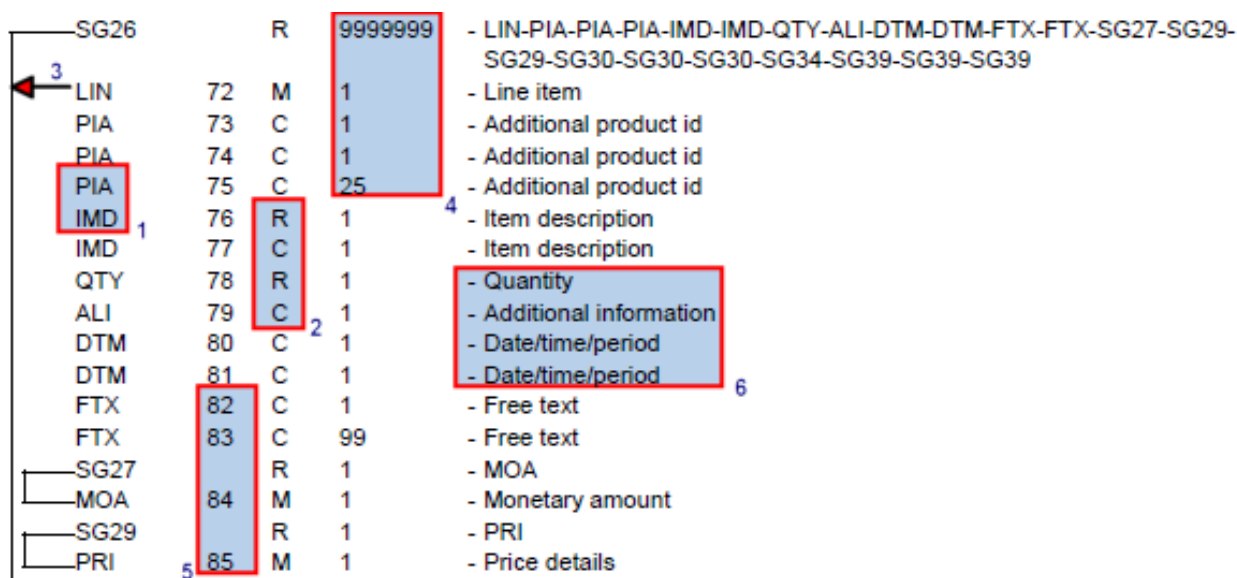
6) Segment name

Figure 2: Message structure chart

7.3.2   Branching diagram

Segments are presented in a hierarchical structure. The following information can be obtained from the composition:

1) Segment code

2) Level in the hierarchy

3) Obligation to enter segment

4) Number of repetitions

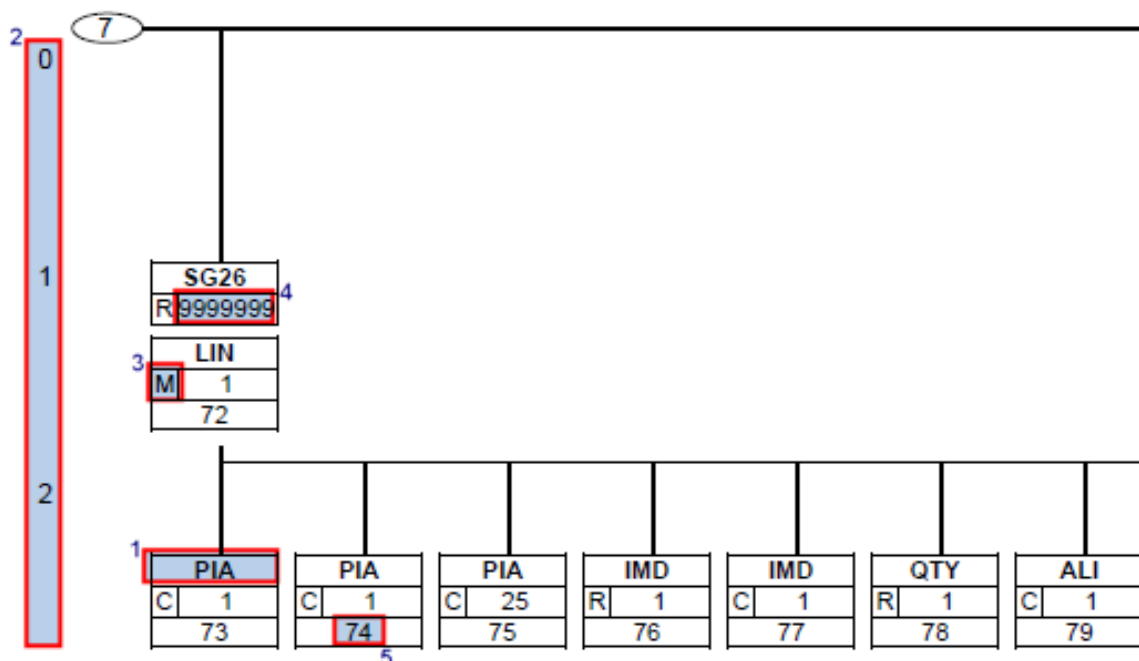5) Serial number of segment in documentation

Figure 3: Branching diagram

7.3.3 Segments

Detailed information about each segment with detailed records of its business terms. The following information can be obtained from the detailed segment data:

1) Segment code

2) Level in the hierarchy

3) Number of repetitions:

    a) For an individual segment

    b) For segments higher in the hierarchy

4) Element code

5) Element name

6) Record format

7) Obligation to enter segment:

    a) For an individual segment

    b) For segments higher in the hierarchy

    c) For individual elements

8) Expected values and instructions for use of each element

9) Demo example of use

10) Serial number of the segment in the documentation

Figure 4: Detailed information on the segment

8 General instructions for implementation

The key advantages of using e-invoices in practice are:

- Simpler preparation, sending, receipt and processing of invoices

- Fewer errors

- Improved payment discipline

- Savings

In order to achieve the above objectives, the efficient implementation of e-invoices in business systems and in e-invoice distribution systems is of key importance. When implementing the issued e-invoices, it is always necessary to keep the recipient in mind as well. The use of structured and accurate data will enable the recipient to take advantage of all the benefits that e-invoicing offers in comparison with paper invoices. The communication between business partners also plays an important role. In order to achieve the objectives such as automatic processing of e-invoices, automatic payments, etc., certain conditions must be met, among others:

- Harmonized item codes

- Harmonized units of measurement

- Harmonized location codes

- Harmonized application of previous documents:

    o Orders

    o Delivery notes

  o   Contracts

  o   Price lists

With effective information technology support, effective communication and agreements reached between business partners, it is possible to implement the process from receipt to payment of the e-invoice completely without human intervention.

8.1   Display of invoice information

Business systems should be able to display all invoice information (all business terms), including attachments (from BT-122 to BT-125). The basic premise is that business partners should be able to understand the electronic invoice at a semantic level without prior consultation or agreements.

8.2   Attachments and supporting documents

Attachments and the supporting documents may be sent together with the e-invoice. The additional documents may include inter alia:

- Various reports

- Additional breaking down of items

- Various spreadsheets

- Documents proving the services rendered or the supply of goods

The attachments may also be located outside of the e-invoice. In such a case, the web address of the attachment location may be provided. The criteria for considering the separation of attachments from the e-invoice can be:

- Size of attachments when downloading

- Sensitivity of the information in the attachment:

  o   Personal information

  o   Business secrets

8.3   Electronic signature

An electronic signature is a tool that can guarantee the authenticity and the integrity of the invoice. Electronic signing of e-invoices is recommended, although the semantic model does not prescribe a mandatory electronic signature.

Literature

[1]   Directive 2014/55/EU of the European Parliament and of the Council of 16 April 2014 on electronic invoicing in public procurement. Available at http://eurlex. europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0055.

[2]   SIST EN 16931-1:2017, *Electronic Invoicing - Part 1: Semantic data model of the core elements of an electronic invoice.*

[3]   SIST-TS CEN/TS 16931-2:2017, *Electronic Invoicing - Part 2: List of syntaxes that comply with EN 16931-1.*

[4]   SIST-TS CEN/TS 16931-3-4:2018, *Electronic invoicing - Part 3-4: Syntax binding for UN/EDIFACT INVOIC D16B.*

[5]   EDIFACT INVOIC D01B.

[6]   ISO/TS 20625:2002, *Electronic data interchange for administration, commerce and transport (EDIFACT) – Rules for the generation of XML scheme files (XSD) on the basis of EDI(FACT) implementation guidelines.*

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