PEPPOL International Invoicing

Pre study report

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OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels Belgium

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This document is approved by:

Version	Approved by
	[Name, role, date, reference]
	[Name, role, date, reference]

Owner, Editor and Contributors

This document is provided by:

Type	Name
Unit	OpenPEPPOL Post Award Community, International invoicing study group
Owner	Paul Simons
Work lead and editor	Georg Birgisson
Contributors	AU – Chao Wang — Australian Taxation Office AU – David Field — Ozedi AU – Hilary Appleton — Australian Taxation Office AU – Jared Cane (JC) — Australian Taxation Office AU – Kanwalpreet Kaur — Australian Taxation Office AU – Mark Stockwell — Australian Taxation Office AU – Martijn Vandenboogaard— Australian Taxation Office AU – Martin Mane — Australian Taxation Office AU – Simon Foster — Australian Business Software Industry Association BE – Paul Simons (PS) — Codabox DE – Aalbert de Niet (AN) — SAP DE – Gabor Nagy — SAP DE – Francois Vigneron (FV) — SAP DK – Charlotte Dahl Skovhus — MySupply ES – Antonio Martínez Martínez — Edicomgroup ES – Oriol Bausà Peris (OB) — B2BRouter FI – Arun Kumar — Basware FI – Manjeet Yadav — Basware FI – Kasperi Rask — Opus Capita IE – Eoin Maguire — DCSdocs IE – Ken Halpin — Celtrino IS – Markus Gudmundsson — Unimaze NL – Michael Riviera — Storecove NO – Arne Johan Larsen — Equinor NO – Siw Midtgård Meckelborg (SMM) — Edisys NZ – Ravi Mistry — New Zealand Ministry of Business, Innovation and Employment SE – Magnus Johansson — DIGG SE – Martin Forsberg — Ecru Consulting SE – Sebastian Boklund (SB) — Pagero SE – Sören Lennartsson (SL) — Ooidata SE – Andreas Carlsson — Pagero SG – Bill Xiao (BX) — IMDA SG – Prasad Kona — IBM Singapore US – Todd Albers — Federal Reserve, MA, USA ?? – enacderaj@gmail.com

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

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1. Executive summary

This report was initiated by the OpenPEPPOL Post Award Community to analyse how invoices could be exchanged internationally in an interoperable way through the PEPPOL network, building on the EN 16931.

The work has taken into consideration high level requirements identified from the EN16931 and its adoption as well as requirements from Singapore, Australia and New Zealand. In addition, there has been cooperation and sharing of requirements with the North American invoicing project BPC (Business Payment Coalition). The details are addressed in chapter 3.

The report finds that it is feasible to build an international invoicing model that would be a combination of shared and aligned content, with the possibility of adding distinct content. The suggested model is explained in chapter 5 of this report but its main components are the following:

- Shared content: invoice content which definitions would be supported by everyone and allow them to use the invoices in general business processes.

- Aligned content: would be understood in general terms by everyone but could be specialized within invoicing domains to support specific requirements, mainly legal ones such as tax.

- Distinct content: the model additionally provides for adding content that is distinct to a specific invoicing domain. This enables support for uncommon requirements or new ones that can then, at a later point, be adopted into the shared or aligned parts of the international invoicing model.

The study finds that with the current PEPPOL BIS Billing 3.0 as well as the specifications developed for Singapore, Australia and New Zealand can be maintained as compliant and interoperable application of an international invoicing model.

Based on analysis of the pros and cons of the current implementation of the PEPPOL Mandatory principle that uses a single mandatory BIS, the report proposes that the PEPPOL network modifies the network lookup for matching documents to receiving capabilities to allow for many versions of mandatory BIS specifications instead of a single one. This is discussed in chapter 7. The report further recommends that the policy decision on how the mandatory principle is applied is separated from the technical capabilities of the network. That would allow PEPPOL management to modify the application of the mandatory principle without being restricted by the network's capabilities. The mandatory policy is discussed in chapter 6.

The report briefly discusses security issues in chapter 8, but finds that while it is an important topic it is not in scope for this report.

The report makes the following recommendations in chapter 10.

- To develop an International invoicing model.

- To modify the SMP lookup of receiving capabilities.

- To review and update the policy on how to apply the Mandatory Principle.

The workgroup finds that if the development of the international model succeeds as in line with the design proposed in this report then migration of current eInvoicing implementations to the international model should require minimal effort.

The workgroup finds that once the development of the PEPPOL international invoicing model has been initiated the model can be developed and tested in 6 to 9 months.

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info@peppol.eu
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2. Introduction

The entry of Singapore as the first non-EU PEPPOL Authority demonstrates that the current mandatory PEPPOL invoice as specified in the PEPPOL BIS Billing 3.0, which is based on the EN16931, poses challenges to countries that do not have VAT and/or countries that not in scope for EU tax regulations. The development of the EN16931 was mandated by Directive 2014/55/EU which states that the EN16931 must support EU Directive 2006/112 on VAT, which it does by applying mandatory rules and restricting possible tax schemes to VAT.

This poses the following challenges for PEPPOL.

- The PEPPOL mandatory principle is implemented for the invoice with the BIS Billing 3.0 specification which is a compliant implementation of the EN16931. As such it enforces EU tax rules which may not be relevant for non-EU countries that are joining PEPPOL.

- The current mandatory BIS Billing 3.0 for invoicing does not provide support for relevant regulation in the non-EU countries in PEPPOL.

- To maintain interoperability throughout its network, PEPPOL needs to develop an invoicing model that can be accepted as a mandatory specification under any legal environment.

To address these challenges, the OpenPEPPOL Post Award Community has, in coordination with OpenPEPPOL management, initiated a workgroup to produce a pre-study report. This pre-study report seeks to identify requirements and concerns related to invoicing[1] in PEPPOL, in a wider international scope than within the European Union (EU)[2], based on input from the countries and regions participating in the workgroup. The report should produce recommendations on how to resolve these challenges. These recommendations will be submitted to OpenPEPPOL management who will then decide on further actions.

The workgroup should reach out and consult volunteer experts from different countries and regions with the purpose of gathering requirements. It should evaluate whether the development of an international invoicing model is feasible and make recommendations to the OpenPEPPOL management on further activities.

The workgroup further defined the objectives of its work and identified general issues that should be taken into consideration.
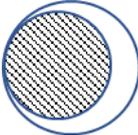
- As legislation in different countries will change over time and introduce previously unidentified legal requirements, the invoicing model must allow for flexibility to quickly support such changes.

- An invoicing model should provide for completeness in supporting domestic requirements within and outside of the EU. It should provide for clarity in specifications to avoid ambiguity in content interpretations and enable high quality of invoice data on the network.

- International interoperability of invoices needs to be implemented with consideration to the identification of receiving capabilities within the PEPPOL network.

- An invoicing model should be practical and prioritise the ability to start implementing the solutions and then adjust based on feedback.

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[1] Unless otherwise stated the term, invoice, should be read as "invoice, credit note and negative invoice"

[2] In the context of this report the term European Union (EU) refers to the countries whose public entities are required by EU Directive 2014/55 to implement the ability to receive electronic invoices that comply with the European Standard on eInvoicing, EN 16931-1. This includes the 28 EU member states and the 3 additional countries within the European Economic Area (Iceland, Liechtenstein and Norway).

2.1.   Glossary of terms

Term	Definition
Invoicing domain	Domains have specific characteristics in terms of legislation and requirements and may be defined by legal jurisdiction or industries. When trading partners are in the same domain, they share these characteristics but if they are in different domains, they may only share some of the characteristics. In international trade, the trading parties are in separate legal jurisdictions but may belong to the same industry.
Invoice content	The content of an invoice, which serves the purpose of fulfilling the requirements that the invoice has been defined for.
Shared content	A set of business terms in the International semantic model, that are defined in detail so that they can be automatically processed without further specification and which definitions are shared unchanged by all users of the international semantic model.
Aligned content	A set of business terms in the International semantic model, that are defined in general terms and that encompass the specific meaning required by different invoicing domains, allowing for specialization to support the requirements of each invoicing domain.
Distinct content	Business terms that can be added to a specification but are not defined in the International invoice model.
Compliant	Some or all features of the international invoice model are used in the specification, and all rules are respected[3].
Conformant	All rules of the international invoice model are respected in the specification, and some additional features not defined in the invoice model are also used[4].
EN16931 (EN)	The European standard for electronic invoicing published by the European Standardization committee, CEN.
PEPPOL mandatory principle	Receivers with a registered receive capability for a business function for which a PEPPOL BIS is available shall have receive capabilities for the PEPPOL BIS registered in an SMP, as a minimum[5].
BIS	PEPPOL Business Interoperability Specification.

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[3] Definition is based on TOGAF.

[4] Definition is based on TOGAF. Additional features can be introduced in various ways including but not limited to the use of additional business terms, additional codes and changes to the definition of terms.

[5] Full text of clause 5 in section 3 of PEPPOL Compliance Policy is "PEPPOL Communities define PEPPOL BIS to promote global interoperability. Nevertheless, new document types and customizations may be defined and supported if they are defined and registered according to PEPPOL registration procedures. Receivers with a registered receive capability for a business function for which a PEPPOL BIS is available shall have receive capabilities for the PEPPOL BIS registered in an SMP, as a minimum."

SMP	Service Metadata Publisher. A service metadata publisher offers a service on the network where information about services of specific businesses can be found and retrieved. It is necessary for a client application to retrieve the metadata about the services for a target business before the client can use those services to send messages to the business.
SBDH	Standard Business Document Header can provide semantic information needed for the routing, processing and business domain context of documents, regardless of the data format of the document. Also called message envelope.
UBL Invoice	An XML messages syntax for an invoice published by Oasis. UBL is an abbreviation for Universal Business Language.
CII	An XML messages syntax for an invoice published by UNCEFACT. CII is an abbreviation for Cross Industry Invoice.
Indirect taxes	An indirect tax (such as sales tax, per unit tax, value added tax (VAT), or goods and services tax (GST), excise, tariff) is a tax collected by an intermediary (such as a retail store) from the person who bears the ultimate economic burden of the tax (such as the consumer). The intermediary later files a tax return and forwards the tax proceeds to government with the return.
VAT	Value Added Tax. The abbreviation is used as a general term for the value added tax system but when relevant and not otherwise stated in this document it refers to value added tax as applied in the European Union, based on the EU Directive 112/2006 and supported by the European eInvoicing Standard EN 16931.
GST	Goods and Service Tax. In this document it is used as a general term.
Sales tax	Sales tax. In this document it is used as a general term.

3. Requirements

The workgroup has collected requirements from its participants and made assessment of these to identify gaps between the PEPPOL BIS Billing 3.0 and non-EU invoicing requirements. The requirements are collected at a general level in order to identify the design needed for an invoicing model. Since creating the model itself is not within scope of this pre-study, the collection of requirements is not intended to be complete nor to be in the detail that may be needed for implementation.

3.1. Gap analysis

3.1.1. Australia and New Zealand

Australia and New Zealand have jointly developed a specification for a Trans-Tasman invoice (AUNZ). This is a single invoice data model where differences in rules between AU and NZ are applied by using conditions, much like what is done in the PEPPOL BIS Billing 3.0 for several countries in Europe. While the AUNZ invoice has limited take-up yet, it was developed in cooperation with several local service providers. Consequently, it can be taken as a fair indicator of local business requirements.

During the development of this specification Australia and New Zealand used the PEPPOL BIS Billing 3.0 as a benchmark as well as taking the methodology of the Singapore extension into consideration.

Compared to the PEPPOL BIS Billing 3.0 the following gaps were noted, but the analysis may not be complete.

- Self-billing is not supported by the general Billing BIS in PEPPOL but can be used in AU by way of another document type code (i.e. different CustomisationID).

- Differences in tax regulations. In addition to GST, other tax types (Wine Equalisation Tax, WET and Luxury Car Tax, LCT) can appear on invoices and their addition affect the calculation of tax total and subtotals of the invoice, i.e. showing the tax total for more than one tax, e.g. GST and LCT. This applies both on document and line level.

- There is a difference in how a tax invoice is identified. In AUNZ an invoice that contains taxes (GST) is a tax invoice and the term commercial invoice may be used for other invoices, including those used in international trade. In the EN 16931 the term commercial invoice is, however, applied as a general term for invoices that claim payment for goods and services. Invoices with or without tax concept are identified by using a category code (an invoice of type 380 may state that it is out of scope for VAT by using category code O). The BIS Billing 3.0 specification supports the ability for an invoice to meet Australian and New Zealand legal requirements of a 'Tax Invoice'. For commercial invoices, the TaxCategory can be used to indicate 'O' out of scope or 'G' tax-free export.

- When foreign suppliers provide imported services to consumers (non-businesses) and digital products such as online supplies of software, digital trade journal/magazine subscriptions, website design or publishing services and legal, accounting or similar consultancy services that are consumed in Australia, they must charge GST. This mainly applies to online services to consumers, but business sales follow different rules. The foreign supplier must obtain the Australian business number (ABN) and a statement that they are registered for GST in Australia, so GST will not be charged on the supply, although some reverse charging may occur. This may have similarities with the EU reverse charge/intracommunity supply VAT rules as well as in requirements for use of tax representatives in some EU member states.

- Although some codes in the code lists only make sense for European trade (e.g. SEPA payment integration), there would be added complexity and little advantage to restrict the use of the codes to a subset where the 'invalid' codes would not be used in practice.

- There is significant tax exemption structure in AU (e.g. basics like fresh food, milk and bread are exempted). This is not unlike EU, but the exemptions are different. NZ on the other hand has much more limited exemptions and generally applies a flat 15% Tax rate. These exemptions are supported in the BIS Billing specification using TaxCategory of 'E' exempt and 'Z' zero-rated.

The general functionality of the invoices is the same as for the PEPPOL BIS Billing 3.0 and the electronic invoice is not designed to support functions like logistics, warehousing or marketing although some of its content may be used for such purposes.

3.1.2. Singapore

Singapore applies GST. Its calculation rules are like the European rules for VAT, but categories are different and there are differences in the handling of exemptions.

Singapore has developed its own extension of the PEPPOL BIS Billing 3.0 and registered it in the PEPPOL network[6]. The extension mainly supresses EN rules that conflict with SG tax requirements, but it only adds Singapore specific rules for the calculation of tax totals for GST where VAT tax calculations are the same.

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[6] More information on Singapore's Nationwide E-Invoicing Framework can be accessed at www.imda.gov.sg/einvoice

Inland Revenue Authority of Singapore (IRAS), the tax authority in Singapore, has issued the "Guide on Accounting Software (for Software Developers)"[7] to spell out guidelines for Accounting Software to follow in order to meet the GST requirement in Singapore. Specifically, the following tax category code are recommended:

Type of Supply	Tax Code	Description	Rate
Standard rated	SR	Local supply of goods and services	7%
	SRCA-S	Customer accounting supply made by the supplier	N/A
	SRCA-C	Customer accounting supply made by the customer on supplier's behalf	7%
Zero rated	ZR	Supplies involving goods for export/ provision of international services	0%
Exempt	ES33	Specific categories of exempt supplies listed under regulation 33 of the GST (General) Regulations	N/A
Exempt	ESN33	Exempt supplies other than those listed under regulation 33 of the GST (General) Regulations	N/A
Deemed supplies	DS	Supplies required to be reported pursuant to the GST legislation	7%
Out-of-Scope supplies	OS	Supplies outside the scope of the GST Act	N/A

In general, requirements on invoice content are the same as in the EN 16931 with one notable difference. When an invoice is issued in a currency other than the sellers accounting currency, the invoice not only needs to show the value of the tax in the accounting currency, as is common in Europe and supported in the EN, but may also be required to show the taxable amount and the invoice total amount in the accounting currency.

It is also noted that the UBL syntax has limited support for invoice amounts in alternative currencies.

3.1.3. North America

In North America the Business Payments Coalition (BPC), which includes representatives from the USA, Canada and Mexico, has evaluated the EN 16931 eInvoicing standard against their business requirements.

The main conclusions are that the EN 16931 semantic data model can be applied in North America for most business terms other than tax. Canada uses GST, USA uses sales and use tax and Mexico uses VAT.

A report draft provided by BPC has noted gaps to the EN 16931 for business related requirements. While the report notes that the main gaps are in tax, since the EN 16931 follows the EU Directive on VAT. A sub group of BPC analysed the VAT tax rules and found that they don't apply but found that the underlying UBL elements are generic enough to support requirements.

Main gaps noted in the BPC report draft missing support for the following business requirements.

- Date of Order Reference.

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[7] The guide can be accessed at https://www.iras.gov.sg/irashome/Businesses/Self-Employed/Getting-it-right/IRAS-Accounting-Software-Register/

- Profile execution identifier that may be used to relate different documents in the same instance of a process.

- Party department code, contact, job title and party related note should be added.

- Payee Address information.

- Contract reference on the line level.

- Other references on the line level.

- Item price discount as percentage.

- Manufacture Identification Number.

- Item Instance.

It is worth noting that some of these requirements were considered in the development of the EN 16931 but not accepted into the EN semantic model. This may in part be due to a difference in scope.

Workgroup members have also noted that, while Canada uses GST like AU, NZ and SG they have a structure of regional tax rules. Same is the case in the USA.

The USA, Canada and Mexico do not have legislation that details what the content of an invoice should be. Nevertheless, there do exist requirements for the content of an invoice when used in a specific business case, such as cross border trade that requires customs clearance, or for tax reporting.

Some of these requirements indicate, for example, that information on where items are delivered from, may be relevant for tax purposes. For example, if a company is registered in one state but their items are shipped from a location in another state to one in yet another one, this may affect taxation.

3.1.4. Other regions

The most common tax system on goods is VAT but other common ones are GST and Sales tax. All these are essentially the same in the way that they are applied to the value of the goods. There are however significant differences between regions on how each of them is calculated and collected. The differences between how VAT is applied between countries may be more varied than the difference between GST and VAT between some other countries. In fact, GST and VAT can in practice be considered two names for the same tax.

The PEPPOL BIS Billing 3.0 uses the country code as a trigger for controlling sellers' country specific rules but there may be cases where national tax rules are different between regions. The EN 16931 support for VAT tax categories for Ceuta and Melilla can be considered regional application of VAT rules since both are part of Spain but apply VAT differently.

An overview of the use of VAT, GST and sales tax or similar tax collections can be found via links provided in the References and links section of this document.

3.1.5. General requirement

During the work, various general requirements were noted. These are not country specific but may be relevant when developing the invoicing model.

- Languages: English may not be the only language that needs to be supported e.g. in code lists? How do we handle interoperability when invoices are in other languages and or non-Latin characters?

- Dates. Not all regions use the Gregorian calendar in domestic trade. An example mentioned has been Thailand.

- Rules on rounding may need to differ between currencies that have different valuations.

- How should we handle the limits of legislation? Noting that legislation may allow different options for complying with legal requirements but for the sake of interoperability and automation those options might be restricted.

- The EN focuses on SEPA as the baseline for payment means but other regions may prefer different means of payment.

- An international invoicing model should provide guidance in supporting cross-border requirements in different cases (non-EU to non-EU cross-border and EU to/from non-EU cross-border).

- The PEPPOL BIS Billing 3.0 is developed for cross border trade within the European single market where customs clearance is not required. The EN 16931 does however also provide for invoicing exports that are to be delivered out of the EU. Nevertheless, it should be considered that customs clearance is an important aspect of international trade and an international invoicing model may need to provide stronger support for customs handling than what is provided for in the PEPPOL BIS Billing 3.0.

- It is noted that the boundaries between Business to business/government invoicing and business to consumer invoicing are becoming increasingly obscure. Many businesses need to send a significant volume of invoices to consumers. These invoices may originate as electronic invoices but be delivered to consumers in other forms or as electronic invoices into financial tool. Consumers are also increasingly starting to issue invoices for service, such as rental services like Airbnb.

3.2.   Main areas of requirements

Based on the requirements and gaps identified in the previous section, the workgroup has generalized the main areas for requirements that an international invoicing model must support.

3.2.1. Tax

Tax regulations can affect the following areas on the invoice.

- Tax types required may include other taxes than VAT/GST/Sales (e.g. alcohol taxes in AU) and the tax categories within a tax type may differ between invoicing domains.

- Tax calculations

- Currencies of amounts such as tax amounts, tax total, invoice total, taxable amount.

- Ship-from and ship-from delivery information.

- Payment terms, split payment for tax.

While tax regulation is clearly the most important cause of different requirements for invoice content, its effect is not limited to the tax classes of an invoice. Tax regulation also affects what other information is required in an invoice and how it is expressed.

This means, for example, that it is not enough to generalize VAT as tax and then simply specialize that for different countries. It also means that business terms that may be considered irrelevant in one country may be legally required in another.

3.2.2. Customs

The workgroup has identified that since the EN 16391 is designed for the European common market it provides limited support for customs clearance. Customs clearance is however a key process in international trade.

Customs regulation, in general terms, address two main topics.

- The collection of taxes and duties on the invoiced items and their value.

- Monitoring and controlling the flow of goods in or out of a country. This is concerned with issues such as whether the items can legally be transported and or whether the concerned parties have the required permission to do so.

A customs declaration is the key document for customs clearance and is prepared and filed by the importer (who may or may not be the buyer). While an invoice is not a customs declaration it does contain information that is important for preparing a customs declaration. In addition to information about the invoiced items and their value the EN 16931 provides for the following information that supports customs clearance:

- Item origin country.

- Item classification code, one of which can be the Customs Harmonized code.

- Delivered to and delivered from location.

- Allowances and charges, which can be used to detail costs that may affect customs.

- Document attachment, which may be used to attach to the invoice, documents that are relevant for the importer (buyer) when he prepares a customs declaration (as example, declaration of origin and various certificates).

3.2.3. Payment

It is noted that there exist national or regional payment services that may either not be available or not allowed in other countries or regions. The EN 16931 uses the SEPA payment system as the common denominator in Europe but that service does not extend beyond Europe. There are also multiple new payment services appearing on global scale, taking advantage of the Internet.

3.3.   Possible alignment

The workgroup has evaluated the PEPPOL BIS Billing 3.0 specification to identify where there might be significant variation in how invoice content is applied in different countries. For this purpose, the content of the invoice model has been arranged into general categories. The assumption is that where there is limited need for variation in the application of the content there is significant possibility to create shared business terms for that content. Where the need for variations is high, an international invoice model could only align that content by defining it in general terms and thus allowing for specialization in how the content is applied in different invoice domains.

Content categories	Purpose	Example details	Variation

Invoice meta data	Information about the invoice itself to identify it and what it is.	Invoice ID, issue date, customization ID, type.	Limited
References	Relating the invoice to other documents to support, approval of the invoice and auditing	Order, delivery note, contract, objects etc.	Limited
Main parties	Identifies those who are trading and for who the invoice is revenue or cost.	Seller's and buyer's names, addresses, contacts, IDs.	Limited
Other parties	Parties who have a role in the process of the invoice and may be relevant in the approval or taxation processing.	Delivery party, tax representative, Payee/Account owner.	Limited
Delivery information	The location from where and to where the items are delivered.	Shipped from address.	Limited
Amounts	The financial amounts that are being charged and should be paid.	Price, quantity, Allowance and charges, totals, currencies.	Limited
Tax	The amounts of tax that are being applied, their type.	Tax amounts, tax types, tax categories, tax exemptions.	Significant
Items	Enable identification of the item and its features. Supports approval, auditing, stocking of items.	Item name, attributes, ids.	Limited
Payment instructions	Instruct the buyer on how to pay the invoice or settle it in other way.	Payment service to be used, account information including owner.	Significant

The conclusion of the exercise is that for most of the invoice content there is limited need for invoice domain variations. This conclusion is supported by findings of SG, AU, NZ and BPC when comparing the EN 16931 to their national business requirements.

4. Cross border trade

The content of an invoice is driven by two main categories of requirements, business and legal.

Business domain
e.g. country A

Business domain
e.g. country B

B1

Business requirements
Legal requirements

S1

Business requirements

Legal
requirements

S2

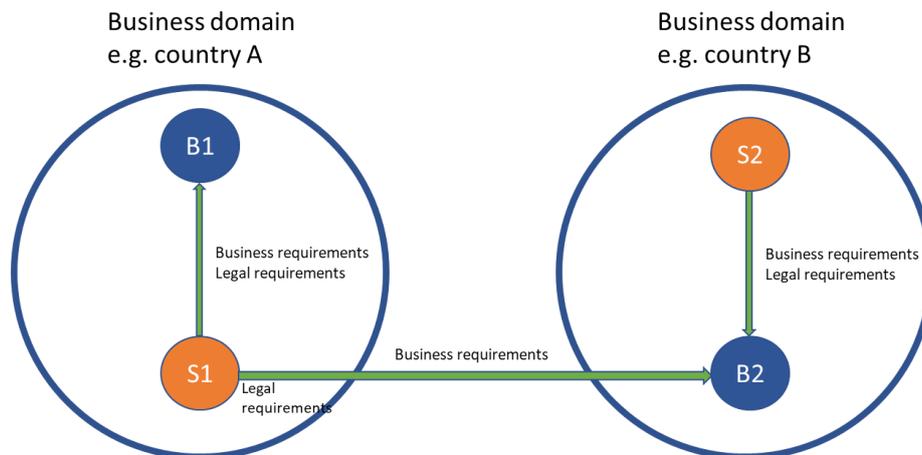Business requirements
Legal requirements

B2

Diagram: The content of an invoice exchanged (green line) between buyers (B1 and B2) and sellers (S1 and S2), is driven by both business and legal requirements of the respective country when exchanged domestically. In international exchange the business requirements need to be shared but the legal content is driven by the seller's legal requirements.

4.1.   Business invoice requirements

Business requirements are derived from the business processes that are used by the seller and the buyer when creating and processing the invoice.

Despite some variations, global business process tends to have the same objectives. The main ones being:

-    Relating the invoice to the business activities that it is based on, e.g. the provision of services or the delivery of goods.

-    Verifying and approving the content of the invoice.

-    Booking the invoiced amounts and other relevant details correctly into financial records.

-    Settling the payment of the invoice.

There is often variation in the processes that are used to achieve these objectives. Existing processes are often based on using paper and when adopting electronic invoices, it is often necessary to modify them, providing an opportunity for aligning them to international standards. Modification of business processes is usually within control of the trading partners themselves.

4.2.   Legal invoice requirements

Legal requirements on invoices are derived from the legislation that applies to the trade. This includes tax legislation, commercial law, corporate legislation and legislation for restricting or monitoring the trade of specific products. The legislation is usually not within the control of the trading partners, mandating them to adopt the invoice requirements that result from the legislation and giving them limited flexibility to modify the requirement through adjusting business processes.

In general, it is legal environment of the seller's country that affects the content of an invoice document, whereas the legislation of the buyer's country is applied through the process of customs clearing. There may however be dependencies where the invoice needs to contain information that is required in the customs process or may affect the results of the customs process.

The seller's and buyer's perspective on invoice content that is driven by legal requirements may differ. An invoice may contain identifiers and taxes that the seller must provide in the invoice to comply with legal requirements in his country. For the buyer, this information may have neutral value. For example, a seller

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

may be required to provide specific information in an invoice to clarify why VAT is not collected in that invoice (e.g. if it is exports). From the perspective of a buyer in another country it is enough to see that the VAT amount in the invoice is zero. He may not need nor want to understand what the legal clarification was and consequently does not need to understand and process that specific information.

5. Suggested model design

It is noted that it may not be feasible nor desirable to create an invoice that considers all requirements from both current and potential future PEPPOL member countries. Such an invoice could be very large and would add information that would only be relevant for a small set of users. Requirements may also change over time. Therefore, there needs to be focus on a design that allows flexibility while reducing complexity.

The following was also noted:

- that we might separate the architectural data model and the business rules. Define an international invoice model with limited rules but allow different stakeholders more flexibility in applying rules to it. Today PEPPOL controls all rules.

- that in the approach to the work we might separate discussions on architecture and design from resolutions of business requirements.

- that there could be one international core and then regional ones.

- that an international invoice should not reduce the quality of a national invoice.

- that if there are domain specific rules, then they may challenge international interoperability.

Questions were also raised whether the invoice should validate tax rules since there are significant dependencies in those and issuers are required to apply tax according defined legislation. Validations could also be split into generic business rules versus tax rules. PEPPOL already uses split validation sets although their split is organized differently.

5.1.   An international invoice model

This chapter intends to define an international invoice model that could become a solution for international invoicing in PEPPOL.

The blue circle of the following diagram represents all the requirements that are supported in the EN 16931, these requirements include both business related requirements and legal requirements. The green circle represents the PEPPOL BIS Billing 3.0 which is a compliant subset of the EN. The third red circle represents any, or all sets of invoicing requirements that are relevant in any country or region that is not part of the EU. The second part of the diagram identifies that the intersection between the different sets of requirements can be identified as requirements that can be shared. These are mainly business requirements that are supporting business processes which are under the control of the businesses and organizations that are using the invoices.
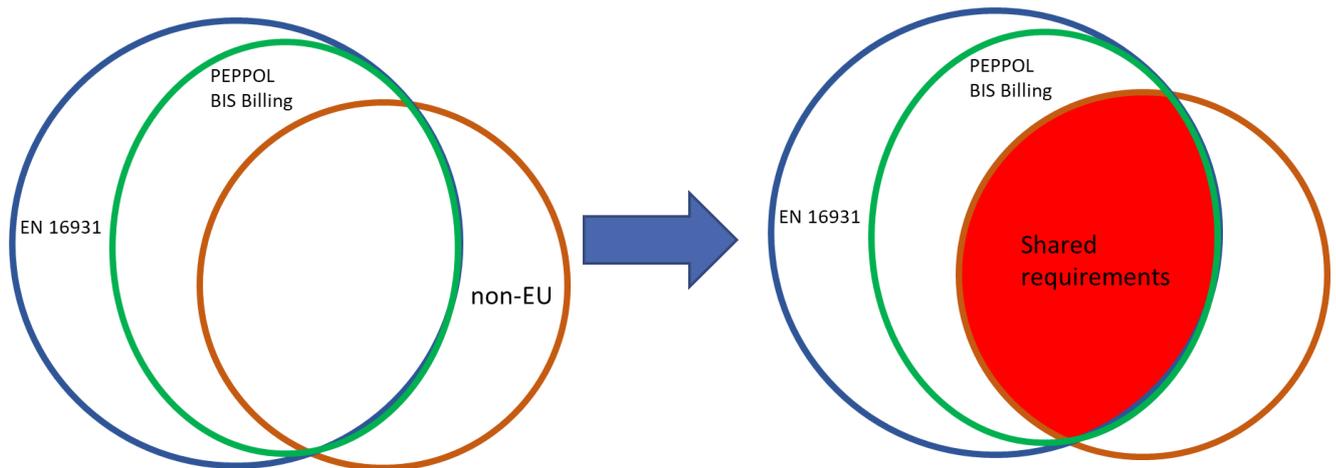
Much of the requirements that are not part of the shared content are similar in nature, even if they are not fully shared. For example, while one country may have VAT tax, and another may have GST tax, these two requirements can indeed both be generalized as tax requirements. It is assumed that while these requirements may be given specialized definition within a country or domain, e.g. by specializing tax as being GST, it is sufficient for those outside of that domain to process the information in general terms. For example if an invoice applies GST tax in one country, from the perspective of a buyer in another country this is just a tax that is part of what he must pay, i.e. he cannot reclaim it.

Generalized requirements can be specialized in each implementation but will remain aligned. The following diagram shows with a red dashed circle a set of aligned invoice content that would cover most or all the requirements that are not shared. These are mainly legal requirements.
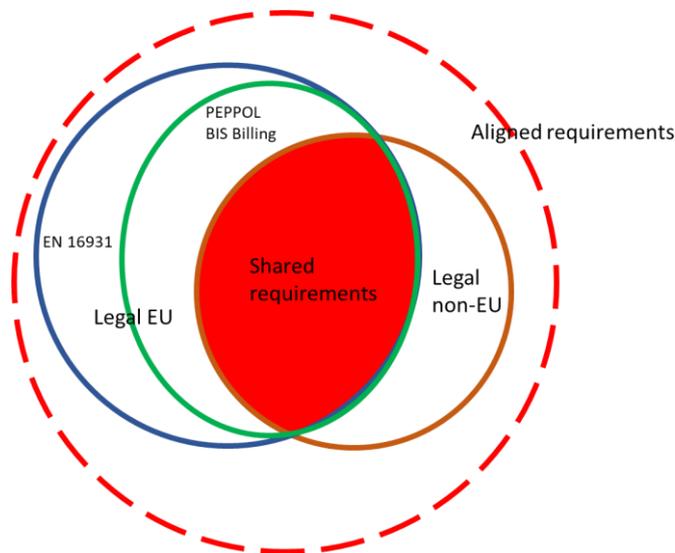
Nevertheless, a solution should provide for the possibility that different invoicing domains have distinct requirements that are not provided for by the aligned content. This is represented with the black circle in the following diagram.
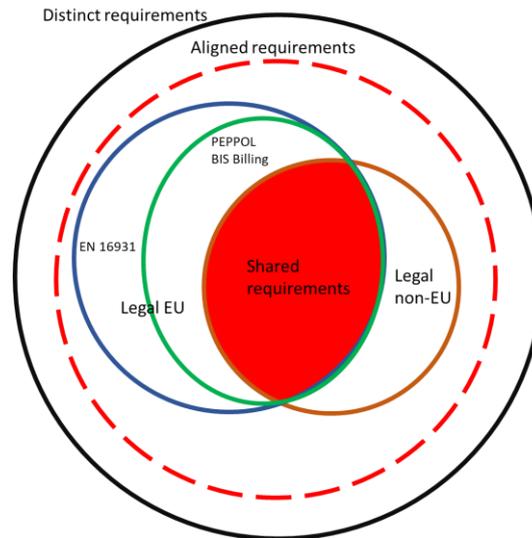
This results in a proposed solution of a two-level international invoice model, that allows for additional distinct requirements.
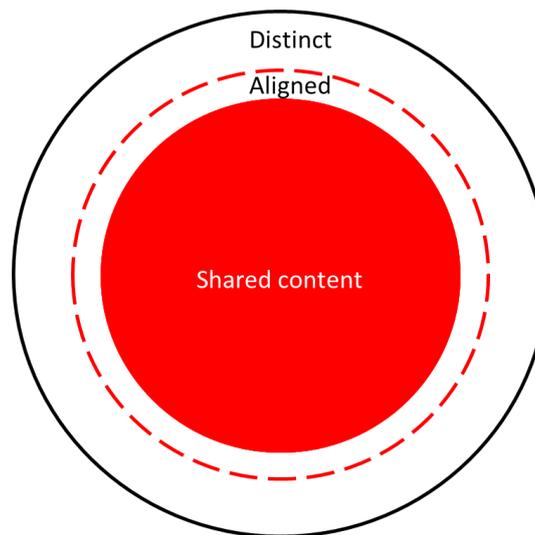
This approach proposes a strictly defined small core that supports general business requirements and then a more generically defined layer that can be specialized for specific implementations, maintaining alignment. For example, instead of defining VAT it would define Tax that can be implemented as either VAT or GST.

Any such specialization does not change the international invoice model itself but creates a specification that is compliant to the model itself. Specifications adding distinct content also do not change the international invoice model itself.

This has similarities to the EN 16931 where the emphasis is that the core provides elements for all legal requirements and most business requirements allowing most implementations to be done by using restrictions.

Further descriptions of each part of the model are provided below.

5.1.1. Shared content

The shared content of the model is the key for interoperability. It is intended to enable exchange of invoices across countries and other invoicing domains in a way that can be processed automatically by the receiver, while it does not necessarily fully support all requirements for the sender. The main characteristics of the shared content are the following:

- It is defined and used in the same way in all invoicing domains.

- It applies minimum rules to the content.

- It is enough for basic automations

    o Reading into ERP system.

    o Booking into accounts.

    o Order to invoice matching.

- Examples of content

    o Invoice meta data

    o Trading parties

    o Total amounts.

    o Items and prices.

    o References.

5.1.2. Aligned content.

The aligned content is defined in a generalized way allowing it to be specialized in each invoicing domain. This allows the receivers to understand the received data in general terms but not necessarily specifically enough to automate its processing. The main characteristics of the aligned content are:

- It is defined in general terms but is expected to be given a more specialized definition in different invoicing domain.

- It can be understood in general terms by all domains.

- It contains no business rules, but rules can be added as part of the specialization.

- The generalized definition of the requirements is not aimed to support automation of processing although some automation may be achieved.

- Examples of content.

    o Tax information.

    o Payment instructions.

5.1.3. Distinct content

The model recognizes that in some invoicing domains some distinct content may be required, for different reasons. The international invoice model should not define these requirements since by doing so they would become either shared or aligned.

- The distinct content may not necessarily be understood by a receiver in a different invoicing domain.

- Examples of content.
    o Content that is distinct for different domains.
        - invoice domain specific legislation and practices.
        - sectoral legislation and practices.

5.1.4. Rules

It was noted that it might be beneficial to separate the data model and the business rules in terms of detailed specification. A data element might be defined strictly but the implementer allowed more flexibility in applying rules than is currently allowed in PEPPOL.

5.2.   International interoperability

The proposed solution enables international interoperability by requiring all participants to support the shared content of an invoice. This allows them to carry out the basic business processes. The alignment of invoice content such as tax information enables general understanding and processing of that information while enabling those who are operating within the domain of that legislation to apply specialized specifications for detailed processing and reporting. In the following diagram the shared component of the international model is the key to international interoperability.

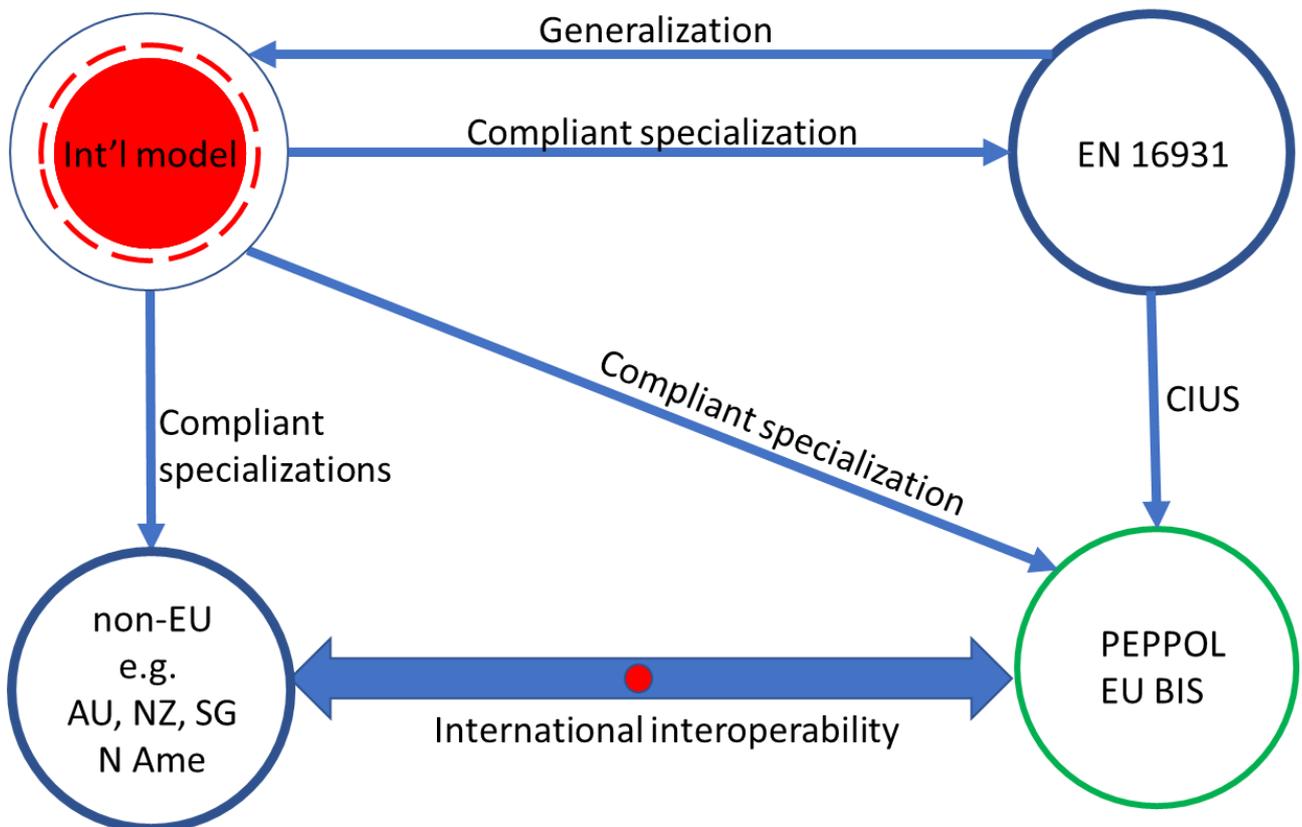Diagram: The international invoice model is derived through generalization of the EN 16931, consequently the EN becomes a comes a compliant specialization of the international model. Other domain specific specification shall also be compliant specializations of the international models. The international interoperability is thus achieved by all invoicing domains supporting the same shared content, shown as the red dot.

5.3. Other designs considered

During the development of this report, several design approaches were considered.

5.3.1. Specific data model with minimal rules

Defining a small data model that would be supported by all PEPPOL members. Such a model by itself could not be used alone by any PEPPOL member requiring it to be implemented specifically. This concept is however partially adopted in the shared content of the international invoice model.

5.3.2. Small specific core with modular additions

A small specific international core together with specified modular additions that can be added for different tax regimes and other requirements. The small core provides the mandatory interoperability. Creating modular components is likely to result in a large number of modules for similar sets or requirements but with slight variations. This may lead to confusion and complex specifications. The concept of a modular design is however partially represented in the aligned content of the international invoice model.

5.3.3. Domain specific invoice specifications

The option of allowing regional invoice specifications in different region was considered. The EN 16931 is in fact an example of such an invoice, being shared by all the countries of the EU. The basis for the EN 16931 in Europe is however the shared legal structure of the EU, mainly through the EU VAT directive. Such a situation is however uncommon. Consequently, such regional invoices are likely to become country specific. In any case this approach is likely to create islands of interoperability with limited interoperability between them.

6. Mandatory invoices

A key principle in the PEPPOL network is the application of the "Mandatory BIS" principle.

The mandatory principle is stated in clause 5 of the PEPPOL compliance policy as:

> "PEPPOL Communities define PEPPOL BIS to promote global interoperability. Nevertheless, new document types and customizations may be defined and supported if they are defined and registered according to PEPPOL registration procedures. Receivers with a registered receive capability for a business function for which a PEPPOL BIS is available shall have receive capabilities for the PEPPOL BIS registered in an SMP, as a minimum."

The objective of this principle is to facilitate full interoperability of a document type throughout the PEPPOL network, thus a new invoice sender can, by using a single document specification, send invoices to all, current and future, invoice receivers in the network and, vice versa, a new receiver can receive from any current and future sender.

This removes the start-up cost for individual sender-to-receiver connections. This has made the use of electronic invoices and automation, economical for connections with low invoice volume[8].

While the mandatory principle does pose challenges when new PEPPOL Authorities join PEPPOL it has been deemed to be a key benefit of using the PEPPOL network, although not without challenge.

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[8] As example, if the cost saving of each electronic invoice is €10 and each new connection would require 2-4 hours of technical work with specifying, adjusting and testing the connection then, assuming a cost of €240, the volume of one monthly invoice would take two years to recover the cost.

Mandating an invoice specification for public procurement in each invoice domain has been shown to encourage adoption in the private sector. For example, in Norway electronic Invoice, production traffic data shows that while the use of a mandatory invoice specification only applies to public procurement, approximately 70 percent of the network traffic is B2B.

Experience has also shown that when there is a widely used mandatory specification, ERP developers and service providers are providing standard solutions and add-on modules at competitive prices.

6.1.   Challenges to the mandatory specification

The main challenges to a mandatory invoice specification include the following.

- A mandatory invoice specification that is detailed and has strict rules regarding its content increase the possibility for the invoice receiver to automate the processing but at the same time may increase the complexity for the sender in issuing that invoice. This may apply especially to SME's using less advanced ERP systems.

- Different receivers who wish to use strictly defined invoices for high level of automation may challenge the principle of being required to receive a mandatory invoice that allows more flexibility.

- National, regional and sectoral legislation and business conventions may call for changed content and rules that are not shared by all.

6.2.   Current application of the mandatory invoice within EU

The PEPPOL mandatory principle for invoices is currently applied by requiring all those who are receiving invoices to register the receiving capability for the PEPPOL BIS Billing 3.0. While PEPPOL does not directly validate this.

Specific invoicing requirements are being handled in three ways.

- By registering another invoice specification in parallel to the PEPPOL BIS Billing 3.0.

   o This has been the case e.g. in Norway with the latest version of PEPPOL invoice, by registering the EHF invoice, but with the adoption of the version 3.0 Norway is phasing out its EHF specifications but will keep EHF as a domestic brand.

   o Sweden has also been using the Svefaktura in parallel to the PEPPOL BIS as an optional specification but implementation in Sweden will be fully aligned with the PEPPOL BIS.

- By using domestic specifications in parallel within alternative networks and connect those to the PEPPOL network for cross border invoices.

   o Denmark has used the Nemhandel network with the OIO invoice specification in parallel to the PEPPOL network. The Nemhandel network has been the primary system for transmitting/sending/exchanging domestic invoices. The OIO invoice specification is now being phased out and replaced by the PEPPOL BIS.

- By using seller's country specific rules within the PEPPOL BIS Billing 3.0

   o The release of the PEPPOL BIS Billing 3.0 introduced the possibility of adding sellers-country specific rules within the same BIS. Norway, Denmark, Sweden and Italy have added such rules. This has enabled Norway, Denmark and Sweden to phase out their country specific specifications but in Italy this is used in parallel.

6.2.1. Sellers country specific rules

The "PEPPOL methodology for national rules based on Sellers country[9]" defines the criteria that such rules must meet.

The essence of the methodology is that PEPPOL Authorities can add rules that are specific to their country, providing that those rules do not interfere with the PEPPOL BIS own rules nor the use of the PEPPOL BIS in any other country. The triggers for the rules are the country code for the supplier. By "country code of the supplier" is meant (in prioritised order)

1. the country code prefixing the Seller VAT identifier (BT-31)

2. The country code prefixing the Sellers Tax Representative VAT identifier (BT-63)

3. The seller country code (BT-40)

Since these rules are triggered by the seller's country code, they will apply to any seller in that country irrelevant of whether his invoice is being sent to a public organization, in a B2B scenario or even in a B2C scenario or whether they are domestic vs international. Consequently, the use of these rules is in practice limited to requirements that apply to all invoices in the country. Examples of such rules are national requirements for certain details to be in all invoices such as a seller's legal registration identifier.

There have been discussions whether buyer specific country rules should be allowed. The main rationale for such rules is to enforce government purchasing procedures and regulations. The challenges to allowing such rules has been that while each seller only belongs to one country, his buyers can belong to different countries which would require the seller to adjust to multiple buyer country rules. Also, if the buyer country rules are in fact public purchasing rules, then they would incorrectly be applied to B2B invoices. Consequently, buyer country rules have not been adopted so far.

Despite the limited allowed scope of the seller country specific rules, this has enabled some countries to phase out their own national invoice specifications.

6.3.   One mandatory BIS or many?

6.3.1. One

Allowing domain specific rules inside the mandatory PEPPOL BIS could be used to maintain full interoperability by mandating a single BIS specification at the same time as supporting invoice domain specific requirements. The main benefit in this case is that there is only a single BIS that everyone must comply with.

The challenge with that approach is that it depends on whether it is possible to isolate the rules for each invoicing domain from the others, i.e. the trigger for each rule must be such that the rules of one invoice domain do not fire when the BIS is used in other domains. This may become increasingly complex as the number of invoicing domains increases with international expansion.

Another challenge is that by keeping all domain specific rules in the same BIS they must be maintained and tested as a single development, i.e. if one domain updates its rules it must coordinate its implementation with the update of the common BIS and every invoicing domain should test and verify if those changes interfere with their invoicing implementations. This may be increasingly complex as the number of domains increases.

Using a single mandatory BIS would also make it difficult for some invoicing domains to add distinct content to invoices in their domain.

A single mandatory BIS would also be dependent on centralized resources for development and testing.

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[9] http://docs.peppol.eu/poacc/billing/3.0/national-rules/

6.3.2. Many

Maintaining interoperability while allowing multiple BIS specifications requires that there is a shared component in all the BIS specifications that enables that interoperability, and that there are clear benchmarks that each BIS must be measured against to be considered compliant.

This would mean that the mandatory principle would need to be changed from "… shall have receive capabilities for the [mandatory] PEPPOL BIS …" to "shall have receive capabilities for any BIS that is compliant to the PEPPOL mandatory invoice model". In other words, the mandatory principle refers to a model rather than to a specific BIS.

A benefit of this approach is that it would reduce the dependencies between the invoicing domains. It would allow them to independently resource their development and to time their own releases. But it would also require clear development benchmarks from PEPPOL.

International interoperability based on a model rather than a single BIS may also scale better as PEPPOL members become increasingly international.

The main challenge with the approach of using many BIS specifications is complexity in matching documents to the receiving capabilities in the transport network.

6.3.3. A modelled approach

There was agreement that by designing a modelled approach PEPPOL would allow for more flexibility in the future, although PEPPOL could, at least in the beginning, attempt to implement the mandatory principle with a single BIS. Then if a single BIS approach becomes difficult to manageable a multi BIS approach to the mandatory principle can be adopted.

6.4. Mandating domain specific specifications

PEPPOL has applied a mandatory BIS specification to ensure interoperability. It is however common that there are invoicing domain specific specifications that are mandated in certain circumstances. The EN 16931 is an example. Currently the mandatory PEPPOL BIS Billing 3.0 is a compliant core invoice usage specification (CIUS) on the EN 16931. The EN defines the concept of CIUS as allowed types of restrictions that can be applied to the core specification. Consequently, those who have receiving capabilities for the PEPPOL BIS Billing 3.0 are also compliant to the EN 16931.

This one to one relation is not in place where other specifications needs to be mandated along with the mandatory PEPPOL BIS. Additionally, this one-to-one relationship may change if the PEPPOL mandatory BIS is modified to make it applicable for non-EU users. This requires that a mandatory principle will need to take into consideration that receivers need to comply with more than one mandatory BIS.

The workgroup has noted the following main strategies that can be used to implement the mandatory principle.

- Single BIS specification.
- All compliant restrictions on the international.
- Multiple regional invoice specifications.

7. Matching to receiving capabilities

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

It has been a key PEPPOL requirement that invoice documents that are sent to a receiver match what the receiver is capable of receiving and that the content of the document is of good quality so that the content of the document matches the relevant document specifications.

This is dependent on two things:

- the sender must know what receiving capabilities the buyer has.

- the sender must be able to validate the document before sending.

This has been a key role of the SMP.

7.1.   Use of identifiers in the network

The PEPPOL invoice uses the following identifiers in the documents and the network.

7.1.1. Customization identifier

An identifier that is in the body of an invoice instance and identifies the message specification that was used when creating that instance. Consequently, it is assumed that the invoice instance complies to that specification, i.e. it is a valid instance. This assumption can be tested by validating the invoice against the identified specification by using its validation artefacts typically, either or both, Schema and Schematron files.

urn:cen.eu:en16931:2017#compliant#urn:fdc:peppol.eu:2017:poacc:billing:3.0

While this means that a valid instance complies to the specification identified by the customization id, that same instance may also comply to other specifications. For example, in the following cases.

- If the specification governing the invoice instance is a subset of another specification, then the invoice instance will also be compliant to that other specification.

- If the invoice instance only contains data that is within the join of its governing specification and another specification, then the invoice instance will also be compliant to that other specification.

7.1.2. SMP document identifier

A party can register itself in the PEPPOL network as being capable of receiving a document that is compliant to a specific specification and mapped to a specific syntax document type and syntax version.

In the SMP this identifier is contained in the <DocumentIdentifier/> tag. The following is an example of a document identifier for an invoice that is based on the PEPPOL BIS Billing 3.0 specification and mapped to the UBL invoice syntax document type, version 2.1

urn:oasis:names:specification:ubl:schema:xsd:Invoice-2::Invoice##urn:cen.eu:en16931:2017#compliant#urn:fdc:peppol.eu:2017:poacc:billing:3.0::2.1

Breaking down the above string:

urn:oasis:names:specification:ubl:schema:xsd:Invoice-2::Invoice
Identifies that the receiver's capability is to process a document mapped to the UBL Invoice as published by OASIS UBL Major Version 2.   In an invoice instance this is identified with its namespace.
Separator
urn:cen.eu:en16931:2017#compliant#urn:fdc:peppol.eu:2017:poacc:billing:3.0

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

	Identifies that the receiver's capability is to process an invoice that is compliant to the PEPPOL BIS Billing 3.0 specification.
	In an invoice instance this is identified with its CustomizationID
::	
	separator
2.1	
	Identifies that the minor version of the syntax message is 2.1
	This is not identified in an invoice instance that is compliant to the EN 16931

7.1.3. SBDH envelope document identifier

When messages are transported through the PEPPOL network they are wrapped in an electronic envelope (Standard Business Document Header, SBDH). The envelope can be generated either along with the invoice as the invoice is issued or later in the transmission process based on the content of the invoice that is being sent. An example of SBDH is below but the relevant parts for the subject are in bold.

```xml
<StandardBusinessDocument xmlns:xs="http://www.w3.org/2001/XMLSchema"
 xmlns="http://www.unece.org/cefact/namespaces/StandardBusinessDocumentHeader">
<StandardBusinessDocumentHeader>
  <HeaderVersion>1.0</HeaderVersion>
  <Sender>
    <Identifier Authority="iso6523-actorid-upis">0088:7315458756324</Identifier>
  </Sender>
  <Receiver>
    <Identifier Authority="iso6523-actorid-upis">0088:4562458856624</Identifier>
  </Receiver>
  <DocumentIdentification>
    <Standard>urn:oasis:names:specification:ubl:schema:xsd:Invoice-2</Standard>
    <TypeVersion>2.1</TypeVersion>
    <InstanceIdentifier>123123</InstanceIdentifier>
    <Type>Invoice</Type>
    <CreationDateAndTime>2019-04-25T15:46:10Z</CreationDateAndTime>
  </DocumentIdentification>
  <BusinessScope>
    <Scope>
      <Type>DOCUMENTID</Type>
      <InstanceIdentifier>urn:oasis:names:specification:ubl:schema:xsd:Invoice-
2::Invoice##urn:cen.eu:en16931:2017#compliant#urn:fdc:peppol.eu:2017:poacc:billing:3.0::2.1</InstanceIdentifier>
    </Scope>
    <Scope>
      <Type>PROCESSID</Type>
      <InstanceIdentifier>urn:fdc:peppol.eu:2017:poacc:billing:01:1.0</InstanceIdentifier>
    </Scope>
  </BusinessScope>
</StandardBusinessDocumentHeader>
<ns4:Invoice xmlns="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2"
xmlns:ns2="urn:oasis:names:specification:ubl:schema:xsd:CommonExtensionComponents-2"
  xmlns:ns3="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2"
xmlns:ns4="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2">
  <!-- etc. -->
</ns4:Invoice>
</StandardBusinessDocument>
```

7.1.4. Passing through the network

The PEPPOL network controls that the message sent to a receiver matches his receiving capabilities.

The method used is that when sending, the sending AP looks up in the SMP the receiving capabilities of the party identified by the Receiver/Identifier.

If the receiver is registered with a receiving capability that matches the information given in the envelope in DocumentIdentification/Standard, DocumentIdentification/TypeVersion and InstanceIdentifier then the transmission is allowed, and the message is sent.

7.1.5. Identifying restrictions

The current one to one identifier matching has the benefit of simplicity in registration. A disadvantage is however that when a PEPPOL authority creates a restriction, there is reluctance to give it a specific identifier. This is because then the PEPPOL network does not allow that document to be sent. The consequence is that, the receiver does not know what specification was used when creating the document.

7.2.   Modifications to the current method

The current method of registering receiving capabilities and matching them in the transmission requires that the customization identifier in the invoice, and consequently in the SBDH envelope exactly matches the customization identifier registered in the SMP as receiving capability.

When a receiver accepts a main specification, by default, he is able and willing to receive any restricted version of that specification.

The benefit of this approach is its simplicity, but a key drawback is that it does not support the fact that a receiver who is accepting a particular invoice specification should always be willing to accept a document that is a restricted version of that specification.

For example, if an invoice send is based on a restriction of Billing BIS 3.0, it will simply be using one of the options allowed in the BIS, when the receiver is capable of receiving the PEPPOL BIS Billing 3.0. That fact that the sender was not allowed to use another option is irrelevant for the receiver.

Addressing this shortcoming of the current approach may be key to enabling the use of multiple BIS specification and there may be many approaches to that solution.

The international invoicing pre-study workgroup has considered several approaches, detailed in the chapters below.

Discussions on these different options for handling receiving capabilities is based on the following assumptions.

1. It can be assumed that if PEPPOL enforces a mandatory principle then by default, everyone who is able to receive an invoice (of any kind) will also receive the mandatory version so there is no need to register that in the SMP for the purpose of informing the sender that the receiver has that receiving capability.

2. It can be assumed that a receiver of a specification will accept and process any document that is based on a restricted version of that specification.

7.2.1. Receiver registers all BIS customization id's supporting 1-1 match.

The current matching method is the full 1-to-1 match. That does not prevent registering multiple receiving capabilities and allowing senders to use any of them. An example has been Norway, where it has been required that receivers register the double capability of receiving both the PEPPOL mandatory BIS and the restricted Norwegian version EHF.

If the number of domain specific invoice specification in an international context increases, this approach may become challenging to manage.

7.2.2. Instance states all BIS customizations id's it complies with, supporting 1-to-1 match

This is a similar approach to registering multiple receiving capabilities, except the other way around. Instead of the receiver registering all specifications that he receives and the sender sends one of those, the sender marks all specifications that the instance complies to and if one of those matches to the receivers's registration then the invoice can be sent.

This approach requires the sender to be aware of the different restrictions that exist and to validate against all of them, requiring him to have access to all validation artefacts.

7.2.3. Network passes through all compliant BIS's of same document type.

If a receiver can receive an invoice, then he shall be able to receive the mandatory invoice and any restricted version of the mandatory invoice.

Then if the document being sent is compliant to the mandatory model there is no need to match to receivers' capabilities, assuming he can receive an invoice at all.

This method must also take into consideration the existence of extensions, i.e. conformant BIS's and how they would be distinguished from the compliant ones.

7.2.4. Disconnect Customization ID and SMP Document ID

Currently there is an alignment between the different identifiers, i.e. the customization id is a part of all three (the id itself in the invoice, the document id in the SBDH and the SMP registration).

This could be disconnected allowing invoices to contain customization identifiers that identify exactly what specification they are based on but then use more general identifiers in the network.

A drawback of this method is that then the SBDH envelope cannot be directly based on the invoice content but there would have to be a secondary process that assigns the correct document type id in the SBDH in line with the invoice.

7.2.5. Using wildcard in registering receiving capabilities

This approach partially disconnects the identifiers by using the specific customization id in the invoice and inside the SBDH document type id but in the SMP the receiver can register receiving capabilities with a wildcard character.

As an example: If the customization id in an invoice is mandatoryBIS-restriction1, then the SBDH identifiers will contain the same id. However, if the receiving capability is registered as mandatoryBIS-* (where * is a wildcard character indicating that the customization id only needs to match up to the wildcard).

With this registration, the receiver will accept mandatoryBIS-restriction1 and also any other restricted version, mandatoryBIS-restriction2, mandatoryBIS-restriction3 etc.

Processing scenarios

The following processing scenarios demonstrate the flexibility given by using wildcard in the receiving capability. For demonstration purposes the customization identifier uses this structure

specificationid#[compliant or conformant]:restrictionid where part after the hashtag can be repeated. As example using the following examples.

pint: the PEPPOL international invoice model.

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

en16931: the European eInvoicing standard

bisbilling: the PEPPOL restriction on the EN 16931

countryA: a specification created by country A

countryB: a specification created by country B

The customization id **pint#compliant:en16931#compliant:bisbilling** is interpreted as, the en16931 is a compliant restriction on the pint and the bisbilling is a compliant restriction on the en16931.
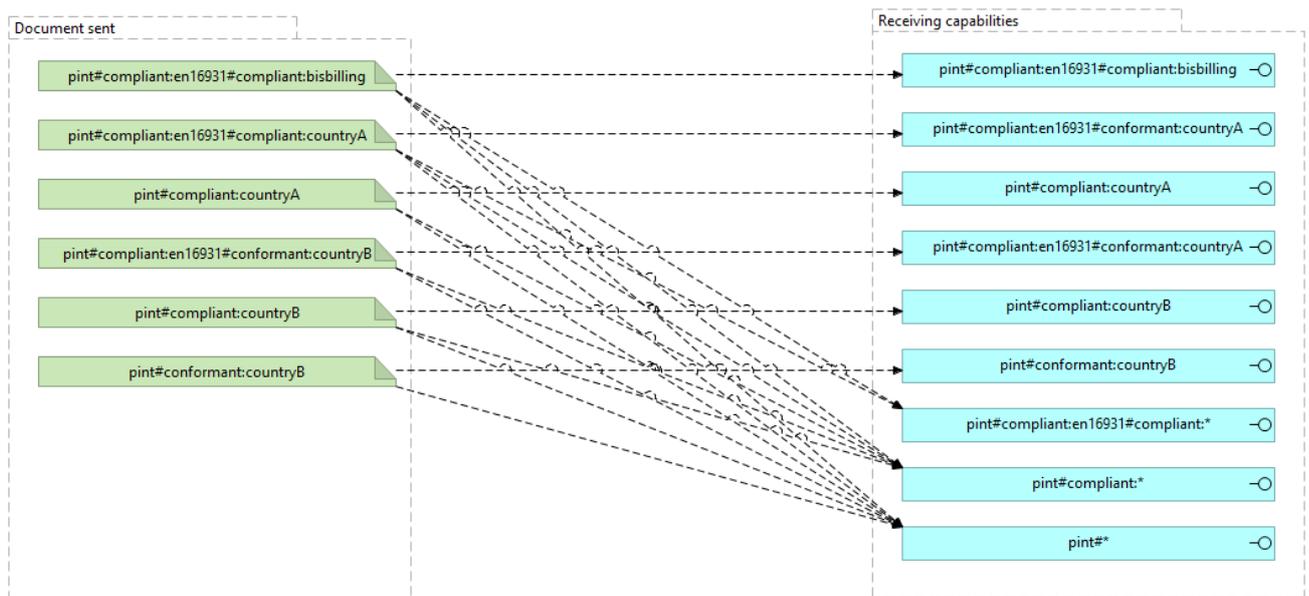
With this approach the receiving capability of pint#compliant:* could be the new specification of the mandatory principle. That would mean that any document that is compliant to the pint will be received and processed.

Including compliant document in the mandatory principle has been suggested as well, that would mean that the criteria for the mandatory principle becomes pint#. This would require a different compliance criteria from what is in EN16931. Extensions such as additional elements could be allowed as long as the receiver is then allowed to ignore those additional elements but, for example, suppressing rules and expanding the semantic definition would not work. Allowing conformant instances within the mandatory principle could however significantly increase the flexibility for adopting users in new invoicing domains.

7.2.6. Considerations for modifications to the SMP.

1. Enable the receiver to identify what is his preferred specification. By doing so he is indirectly registering what invoicing domain he belongs to.

2. It may be beneficial to add to the registration of a receiving party in the SMP information about his country, i.e. his legal domain. This might enable network rules such as if senders and receivers are within the same domain then e.g. a certain specification must be used.

8. Security

Security is recognized as an important issue in the exchange of electronic invoices. Security is identified as being relevant in three scenarios.

- Payload encryption — for secrecy of the content
    - Routing in the PEPPOL network is done with an SBDH envelope.
    - The payload can be encrypted in the envelope.
    - Routing based on payload content needs to be done after decryption.
- Signature in the network — to support for traceability of the message
    - In PEPPOL traceability within the network is supported by use of certification keys.
    - Traceability beyond the PEPPOL network is out of.
- Signature inside payloads — for authenticity, tamper proofing
    - Payload signature is not currently supported in PEPPOL.
    - For the invoice message this is not in scope for this workgroup.
    - Identified as a topic to be addressed by PEPPOL in another work item.

The workgroup agrees that while security issues are important and it may be relevant for PEPPOL to address them further, they are not in scope for this team. The international invoice model and its transmission through the PEPPOL network does not place requirements on security issues on any of the three levels. Requirements imposed on the content of an invoice can be accommodated at later dates as requests for functional additions into an invoice model.

9. Migration

When an invoicing model and any other modification have been completed there will have to be a migration to this new model. The workgroup considered what would be the implication of such a migration given the following scenarios.

- At date A, which is just before publishing the international invoice the situation is expected to be.
    - Europe will be fully supporting BIS 3.0 Billing
    - Singapore will be supporting the Singapore extension of BIS 3.0 Billing.
    - AU and NZ will be supporting the AUNZ extension of the BIS 3.0 Billing.
- At date B, which is when the international invoice is published, we will have one of two situations.
    - **Situation A:** where the design of the international model allows the above implementations to continue as compliant implementations.
    - **Situation B** where the design of the international model requires some modification to the above for them to be compliant.
- If situation B exists, then there needs to be a date C at which point existing implementations have been aligned to the international invoice.

It was identified that by incorporating the extension part of SG and AUNZ into the international invoice, it should be possible to avoid situation B. The aim would be to seek the lowest common denominator.

With successful execution of this approach the adoption of the international model would require minimal migration effort.

10. Conclusion and Recommendations

10.1. Conclusions

It is the conclusion of the PEPPOL International Invoicing pre-study workgroup that it is feasible to develop an international invoicing model that simultaneously supports international interoperability and provides flexibility to support invoicing domain specific requirements.

Developing such a model is a challenging task but considered to be feasible because the EN 16931 provides a firm base, supported with significant experience from 2 years of implementing it in Europe as well as support from direct input and experience from applying it, partially, in Singapore, Australia and New Zealand. Analysis done in the BPC project in North America also provides valuable input.

The benefits of such a model will be significant as it would strengthen PEPPOL adoption in additional countries.

It is also the conclusion of the study that while it is important for PEPPOL to maintain a mandatory principle it is necessary to re-evaluate how it is applied and possibly change it. Changing the mandatory principle is also likely to require changes in the PEPPOL network but those changes should be possible within the current network design as they could probably be limited to modifying rules for matching capabilities. They may also call for adding fields to the SMP and/or the SBDH envelope.

The workgroup makes the following recommendations.

10.2. Recommendation A — Develop an international model

10.2.1. Proposal

PEPPOL develops an international invoice model that has two core levels, a shared and aligned. The model also allows the use of distinct content. As part of that work the scope of the invoicing should be considered including the use for B2C invoicing. The suggested model is described in chapter 5 of this report.

10.2.2. Justification

In order to expand internationally PEPPOL needs to create an invoicing model that at same time allows the necessary flexibility for international adoption and maintains the benefits of using a mandatory principle.

10.2.3. Execution

Establish a team to develop and test the model.

10.3. Recommendation B — Modifying the SMP lookup

10.3.1. Proposal

PEPPOL should modify the SMP registration and lookup to provide flexibility in the use of customization identifiers by introducing a wildcard character into registration of receiving capabilities in the SMP and modify the matching functionality accordingly. For further details, refer to chapter 7.2.5.

10.3.2. Justification

To enable exchange of invoices in an international setting where different invoicing domains may use specifications that support their unique legislative requirements. These invoices can still be exchanged with other invoicing domains who would process them based on the shared content of the invoicing model.

10.3.3. Execution

Establish a work team in cooperation with OpenPEPPOL eDelivery.

10.4. Recommendation C — Updating the mandatory principle

10.4.1. Proposal

OpenPEPPOL updates the policy on the mandatory principle taking into consideration the options and evaluations made in chapter 6 of this document.

The decision on the updated principle should be taken after the invoicing model and the SMP lookup modification have been designed more clearly.

10.4.2. Justification

The current mandatory principle, which enforces a specific BIS, depends on there being a single BIS that is relevant for all PEPPOL participants. This may not be the case in an international environment. To be able to evaluate the different options for mandatory principle there need to be a better understanding of how the invoice model and the SMP will function.

10.4.3. Execution

Activity is carried out by OpenPEPPOL management.

10.5. Planning

The development of recommendation A and B are roughly estimated as follow:

10.5.1. International invoicing model

The following duration is based on developing the model from the EN 16931 and using its specification as base, either unchanged or by generalizing them.

Activity	Duration in months
Develop the invoicing model based on EN 16931, collecting requirements from invoicing domains and modifying the model accordingly.	4-7
Approval process, management and review.	1
Publication.	1

The above estimates 6 to 9 months duration of work after initiation. If the work is initiated in the early fall of 2019 that puts the delivery of the international invoice model in the spring of 2020. Planning of adoption and implementation of the model throughout PEPPOL is not addressed here.

10.5.2. Modifying the SMP lookup

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

Planning of designing and implementation of modification to the SMP lookup are dependent on the eventual technical design and must be made in cooperation with OpenPEPPOL eDelivery.

11. Appendixes

11.1.   References and links

11.1.1. Relevant legislation and information

European VAT Directive 2006/55 https://eur-lex.europa.eu/eli/dir/2006/112/oj

European Directive 2014/55 on electronic invoicing in public procurement https://eur-lex.europa.eu/eli/dir/2014/55/oj

Australian A New Tax System (Goods and Services Tax) Act 1999 - https://www.legislation.gov.au/Details/C2019C00140

New Zealand Goods and Services Tax Act 1985 - http://www.legislation.govt.nz/act/public/1985/0141/latest/DLM81035.html

Singapore Nationwide E-Invoicing Framework -www.imda.gov.sg/einvoice

Singapore Guide on accounting software: https://www.iras.gov.sg/irashome/Businesses/Self-Employed/Getting-it-right/IRAS-Accounting-Software-Register/

11.1.2. Overview of tax systems and rates across the world

Compiled by Deloitte

https://www2.deloitte.com/global/en/pages/tax/solutions/global-indirect-tax-rates.html?id=global:2em:3cc:4dcom_share:5awa:6dcom:tax

Compiled by Price Waterhouse Coopers (PWC)

http://taxsummaries.pwc.com/ID/Value-added-tax-(VAT)-rates#R171

Structure of VAT and GST identifiers in various countries

https://en.wikipedia.org/wiki/VAT_identification_number

11.2.   Singapore invoice specification

The Singapore invoice specification is an extension on the PEPPOL BIS Billing 3.0, mainly by removing rules that enforce EU VAT regulations. The specification is available at the following link.

https://github.com/SG-PEPPOL

11.3.   Australian and New Zealand invoice

Australia and New Zealand are in the process of developing an extension to the PEPPOL BIS Billing 3.0. The AUNZ specification is a single specification for both countries using seller country rules in a similar way as the PEPPOL BIS Billing 3.0 does in Europe. The specification is still in development and not ready for distribution.

11.4.   EN 16931 data model

Line	ID	Level	Card	Business Term	Description
2	BT-1	+	1..1	Invoice number	A unique identification of the Invoice.
3	BT-2	+	1..1	Invoice issue date	The date when the Invoice was issued.
4	BT-3	+	1..1	Invoice type code	A code specifying the functional type of the Invoice.
5	BT-5	+	1..1	Invoice currency code	The currency in which all Invoice amounts are given, except for the Total VAT amount in accounting currency.
6	BT-6	+	0..1	VAT accounting currency code	The currency used for VAT accounting and reporting purposes as accepted or required in the country of the Seller.
7	BT-7	+	0..1	Value added tax point date	The date when the VAT becomes accountable for the Seller and for the Buyer in so far as that date can be determined and differs from the date of issue of the invoice, according to the VAT directive.
8	BT-8	+	0..1	Value added tax point date code	The code of the date when the VAT becomes accountable for the Seller and for the Buyer.
9	BT-9	+	0..1	Payment due date	The date when the payment is due.
10	BT-10	+	0..1	Buyer reference	An identifier assigned by the Buyer used for internal routing purposes.
11	BT-11	+	0..1	Project reference	The identification of the project the invoice refers to
12	BT-12	+	0..1	Contract reference	The identification of a contract.
13	BT-13	+	0..1	Purchase order reference	An identifier of a referenced purchase order, issued by the Buyer.
14	BT-14	+	0..1	Sales order reference	An identifier of a referenced sales order, issued by the Seller.
15	BT-15	+	0..1	Receiving advice reference	An identifier of a referenced receiving advice.
16	BT-16	+	0..1	Despatch advice reference	An identifier of a referenced despatch advice.
17	BT-17	+	0..1	Tender or lot reference	The identification of the call for tender or lot the invoice relates to.
18	BT-18	+	0..1	Invoiced object identifier	An identifier for an object on which the invoice is based, given by the Seller.
			0..1	Scheme identifier	The identification scheme identifier of the Invoiced object identifier.
20	BT-19	+	0..1	Buyer accounting reference	A textual value that specifies where to book the relevant data into the Buyer's financial accounts.
21	BT-20	+	0..1	Payment terms	A textual description of the payment terms that apply to the amount due for payment (Including description of possible penalties).
22	BG-1	+	0..n	INVOICE NOTE	A group of business terms providing textual notes that are relevant for the invoice, together with an indication of the note subject.
23	BT-21	++	0..1	Invoice note subject code	The subject of the textual note in BT-22.

Line	ID	Level	Card	Business Term	Description
24	BT-22	++	1..1	Invoice note	A textual note that gives unstructured information that is relevant to the Invoice as a whole.
25	BG-2	+	1..1	PROCESS CONTROL	A group of business terms providing information on the business process and rules applicable to the Invoice document.
26	BT-23	++	0..1	Business process type	Identifies the business process context in which the transaction appears, to enable the Buyer to process the Invoice in an appropriate way.
27	BT-24	++	1..1	Specification identifier	An identification of the specification containing the total set of rules regarding semantic content, cardinalities and business rules to which the data contained in the instance document conforms.
28	BG-3	+	0..n	PRECEDING INVOICE REFERENCE	A group of business terms providing information on one or more preceding Invoices.
29	BT-25	++	1..1	Preceding Invoice reference	The identification of an Invoice that was previously sent by the Seller.
30	BT-26	++	0..1	Preceding Invoice issue date	The date when the Preceding Invoice was issued.
31	BG-4	+	1..1	SELLER	A group of business terms providing information about the Seller.
32	BT-27	++	1..1	Seller name	The full formal name by which the Seller is registered in the national registry of legal entities or as a Taxable person or otherwise trades as a person or persons.
33	BT-28	++	0..1	Seller trading name	A name by which the Seller is known, other than Seller name (also known as Business name).
34	BT-29	++	0..n	Seller identifier	An identification of the Seller.
35			0..1	Scheme identifier	The identification scheme identifier of the Seller identifier.
36	BT-30	++	0..1	Seller legal registration identifier	An identifier issued by an official registrar that identifies the Seller as a legal entity or person.
37			0..1	Scheme identifier	The identification scheme identifier of the Seller legal registration identifier.
38	BT-31	++	0..1	Seller VAT identifier	The Seller's VAT identifier (also known as Seller VAT identification number).
39	BT-32	++	0..1	Seller tax registration identifier	The local identification (defined by the Seller's address) of the Seller for tax purposes or a reference that enables the Seller to state his registered tax status.
40	BT-33	++	0..1	Seller additional legal information	Additional legal information relevant for the Seller.
41	BT-34	++	0..1	Seller electronic address	Identifies the Seller's electronic address to which the application level response to the invoice may be delivered.
42			1..1	Scheme identifier	The identification scheme identifier of the Seller electronic address.
43	BG-5	++	1..1	SELLER POSTAL ADDRESS	A group of business terms providing information about the address of the Seller.
44	BT-35	+++	0..1	Seller address line 1	The main address line in an address.

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

Line	ID	Level	Card	Business Term	Description
45	BT-36	+++	0..1	Seller address line 2	An additional address line in an address that can be used to give further details supplementing the main line.
46	BT-162	+++	0..1	Seller address line 3	An additional address line in an address that can be used to give further details supplementing the main line.
47	BT-37	+++	0..1	Seller city	The common name of the city, town or village, where the Seller address is located.
48	BT-38	+++	0..1	Seller post code	The identifier for an addressable group of properties according to the relevant postal service.
49	BT-39	+++	0..1	Seller country subdivision	The subdivision of a country.
50	BT-40	+++	1..1	Seller country code	A code that identifies the country.
51	BG-6	++	0..1	SELLER CONTACT	A group of business terms providing contact information about the Seller.
52	BT-41	+++	0..1	Seller contact point	A contact point for a legal entity or person.
53	BT-42	+++	0..1	Seller contact telephone number	A phone number for the contact point.
54	BT-43	+++	0..1	Seller contact email address	An e-mail address for the contact point.
55	BG-7	+	1..1	BUYER	A group of business terms providing information about the Buyer.
56	BT-44	++	1..1	Buyer name	The full name of the Buyer.
57	BT-45	++	0..1	Buyer trading name	A name by which the Buyer is known, other than Buyer name (also known as Business name).
58	BT-46	++	0..1	Buyer identifier	An identifier of the Buyer.
59			0..1	Scheme identifier	The identification scheme identifier of the Buyer identifier.
60	BT-47	++	0..1	Buyer legal registration identifier	An identifier issued by an official registrar that identifies the Buyer as a legal entity or person.
61			0..1	Scheme identifier	The identification scheme identifier of the Buyer legal registration identifier.
62	BT-48	++	0..1	Buyer VAT identifier	The Buyer's VAT identifier (also known as Buyer VAT identification number).
63	BT-49	++	0..1	Buyer electronic address	Identifies the Buyer's electronic address to which the invoice is delivered.
64			1..1	Scheme identifier	The identification scheme identifier of the Buyer electronic address.
65	BG-8	++	1..1	BUYER POSTAL ADDRESS	A group of business terms providing information about the postal address for the Buyer.
66	BT-50	+++	0..1	Buyer address line 1	The main address line in an address.
67	BT-51	+++	0..1	Buyer address line 2	An additional address line in an address that can be used to give further details supplementing the main line.
68	BT-163	+++	0..1	Buyer address line 3	An additional address line in an address that can be used to give further details supplementing the main line.
69	BT-52	+++	0..1	Buyer city	The common name of the city, town or village, where the Buyer's address is located.

Line	ID	Level	Card	Business Term	Description
70	BT-53	+++	0..1	Buyer post code	The identifier for an addressable group of properties according to the relevant postal service.
71	BT-54	+++	0..1	Buyer country subdivision	The subdivision of a country.
72	BT-55	+++	1..1	Buyer country code	A code that identifies the country.
73	BG-9	++	0..1	BUYER CONTACT	A group of business terms providing contact information relevant for the Buyer.
74	BT-56	+++	0..1	Buyer contact point	A contact point for a legal entity or person.
75	BT-57	+++	0..1	Buyer contact telephone number	A phone number for the contact point.
76	BT-58	+++	0..1	Buyer contact email address	An e-mail address for the contact point.
77	BG-10	+	0..1	PAYEE	A group of business terms providing information about the Payee, i.e. the role that receives the payment.
78	BT-59	++	1..1	Payee name	The name of the Payee.
79	BT-60	++	0..1	Payee identifier	An identifier for the Payee.
80			0..1	Scheme identifier	The identification scheme identifier of the Payee identifier.
81	BT-61	++	0..1	Payee legal registration identifier	An identifier issued by an official registrar that identifies the Payee as a legal entity or person.
82			0..1	Scheme identifier	The identification scheme identifier of the Payee legal registration identifier.
83	BG-11	+	0..1	SELLER TAX REPRESENTATIVE PARTY	A group of business terms providing information about the Seller's tax representative.
84	BT-62	++	1..1	Seller tax representative name	The full name of the Seller's tax representative party.
85	BT-63	++	1..1	Seller tax representative VAT identifier	The VAT identifier of the Seller's tax representative party.
86	BG-12	++	1..1	SELLER TAX REPRESENTATIVE POSTAL ADDRESS	A group of business terms providing information about the postal address for the tax representative party.
87	BT-64	+++	0..1	Tax representative address line 1	The main address line in an address.
88	BT-65	+++	0..1	Tax representative address line 2	An additional address line in an address that can be used to give further details supplementing the main line.
89	BT-164	+++	0..1	Tax representative address line 3	An additional address line in an address that can be used to give further details supplementing the main line.
90	BT-66	+++	0..1	Tax representative city	The common name of the city, town or village, where the tax representative address is located.
91	BT-67	+++	0..1	Tax representative post code	The identifier for an addressable group of properties according to the relevant postal service.
92	BT-68	+++	0..1	Tax representative country subdivision	The subdivision of a country.
93	BT-69	+++	1..1	Tax representative country code	A code that identifies the country.

Line	ID	Level	Card	Business Term	Description
94	BG-13	+	0..1	DELIVERY INFORMATION	A group of business terms providing information about where and when the goods and services invoiced are delivered.
95	BT-70	++	0..1	Deliver to party name	The name of the party to which the goods and services are delivered.
96	BT-71	++	0..1	Deliver to location identifier	An identifier for the location at which the goods and services are delivered.
97			0..1	Scheme identifier	The identification scheme identifier of the Deliver to location identifier.
98	BT-72	++	0..1	Actual delivery date	the date on which the supply of goods or services was made or completed.
99	BG-14	++	0..1	INVOICING PERIOD	A group of business terms providing information on the invoice period.
100	BT-73	+++	0..1	Invoicing period start date	The date when the Invoice period starts.
101	BT-74	+++	0..1	Invoicing period end date	The date when the Invoice period ends.
102	BG-15	++	0..1	DELIVER TO ADDRESS	A group of business terms providing information about the address to which goods and services invoiced were or are delivered.
103	BT-75	+++	0..1	Deliver to address line 1	The main address line in an address.
104	BT-76	+++	0..1	Deliver to address line 2	An additional address line in an address that can be used to give further details supplementing the main line.
105	BT-165	+++	0..1	Deliver to address line 3	An additional address line in an address that can be used to give further details supplementing the main line.
106	BT-77	+++	0..1	Deliver to city	The common name of the city, town or village, where the deliver to address is located.
107	BT-78	+++	0..1	Deliver to post code	The identifier for an addressable group of properties according to the relevant postal service.
108	BT-79	+++	0..1	Deliver to country subdivision	The subdivision of a country.
109	BT-80	+++	1..1	Deliver to country code	A code that identifies the country.
110	BG-16	+	0..1	PAYMENT INSTRUCTIONS	A group of business terms providing information about the payment.
111	BT-81	++	1..1	Payment means type code	The means, expressed as code, for how a payment is expected to be or has been settled.
112	BT-82	++	0..1	Payment means text	The means, expressed as text, for how a payment is expected to be or has been settled.
113	BT-83	++	0..1	Remittance information	A textual value used to establish a link between the payment and the Invoice, issued by the Seller.
114	BG-17	++	0..n	CREDIT TRANSFER	A group of business terms to specify credit transfer payments.
115	BT-84	+++	1..1	Payment account identifier	A unique identifier of the financial payment account, at a payment service provider, to which payment should be made.
116	BT-85	+++	0..1	Payment account name	The name of the payment account, at a payment service provider, to which payment should be made.
117	BT-86	+++	0..1	Payment service provider identifier	An identifier for the payment service provider where a payment account is located.

Line	ID	Level	Card	Business Term	Description
118	BG-18	++	0..1	PAYMENT CARD INFORMATION	A group of business terms providing information about card used for payment contemporaneous with invoice issuance.
119	BT-87	+++	1..1	Payment card primary account number	The Primary Account Number (PAN) of the card used for payment.
120	BT-88	+++	0..1	Payment card holder name	The name of the payment card holder.
121	BG-19	++	0..1	DIRECT DEBIT	A group of business terms to specify a direct debit.
122	BT-89	+++	0..1	Mandate reference identifier	Unique identifier assigned by the Payee for referencing the direct debit mandate.
123	BT-90	+++	0..1	Bank assigned creditor identifier	Unique banking reference identifier of the Payee or Seller assigned by the Payee or Seller bank.
124	BT-91	+++	0..1	Debited account identifier	The account to be debited by the direct debit.
125	BG-20	+	0..n	DOCUMENT LEVEL ALLOWANCES	A group of business terms providing information about allowances applicable to the Invoice as a whole.
126	BT-92	++	1..1	Document level allowance amount	The amount of an allowance, without VAT.
127	BT-93	++	0..1	Document level allowance base amount	The base amount that may be used, in conjunction with the document level allowance percentage, to calculate the document level allowance amount.
128	BT-94	++	0..1	Document level allowance percentage	The percentage that may be used, in conjunction with the document level allowance base amount, to calculate the document level allowance amount.
129	BT-95	++	1..1	Document level allowance VAT category code	A coded identification of what VAT category applies to the document level allowance.
130	BT-96	++	0..1	Document level allowance VAT rate	The VAT rate, represented as percentage that applies to the document level allowance.
131	BT-97	++	0..1	Document level allowance reason	The reason for the document level allowance, expressed as text.
132	BT-98	++	0..1	Document level allowance reason code	The reason for the document level allowance, expressed as a code.
133	BG-21	+	0..n	DOCUMENT LEVEL CHARGES	A group of business terms providing information about charges and taxes other than VAT, applicable to the Invoice as a whole.
134	BT-99	++	1..1	Document level charge amount	The amount of a charge, without VAT.
135	BT-100	++	0..1	Document level charge base amount	The base amount that may be used, in conjunction with the document level charge percentage, to calculate the document level charge amount.
136	BT-101	++	0..1	Document level charge percentage	The percentage that may be used, in conjunction with the document level charge base amount, to calculate the document level charge amount.
137	BT-102	++	1..1	Document level charge VAT category code	A coded identification of what VAT category applies to the document level charge.

Line	ID	Level	Card	Business Term	Description
138	BT-103	++	0..1	Document level charge VAT rate	The VAT rate, represented as percentage that applies to the document level charge.
139	BT-104	++	0..1	Document level charge reason	The reason for the document level charge, expressed as text.
140	BT-105	++	0..1	Document level charge reason code	The reason for the document level charge, expressed as a code.
141	BG-22	+	1..1	DOCUMENT TOTALS	A group of business terms providing the monetary totals for the Invoice.
142	BT-106	++	1..1	Sum of Invoice line net amount	Sum of all Invoice line net amounts in the Invoice.
143	BT-107	++	0..1	Sum of allowances on document level	Sum of all allowances on document level in the Invoice.
144	BT-108	++	0..1	Sum of charges on document level	Sum of all charges on document level in the Invoice.
145	BT-109	++	1..1	Invoice total amount without VAT	The total amount of the Invoice without VAT.
146	BT-110	++	0..1	Invoice total VAT amount	The total VAT amount for the Invoice.
147	BT-111	++	0..1	Invoice total VAT amount in accounting currency	The VAT total amount expressed in the accounting currency accepted or required in the country of the Seller.
148	BT-112	++	1..1	Invoice total amount with VAT	The total amount of the Invoice with VAT.
149	BT-113	++	0..1	Paid amount	The sum of amounts which have been paid in advance.
150	BT-114	++	0..1	Rounding amount	The amount to be added to the invoice total to round the amount to be paid.
151	BT-115	++	1..1	Amount due for payment	The outstanding amount that is requested to be paid.
152	BG-23	+	1..n	VAT BREAKDOWN	A group of business terms providing information about VAT breakdown by different categories, rates and exemption reasons
153	BT-116	++	1..1	VAT category taxable amount	Sum of all taxable amounts subject to a specific VAT category code and VAT category rate (if the VAT category rate is applicable).
154	BT-117	++	1..1	VAT category tax amount	The total VAT amount for a given VAT category.
155	BT-118	++	1..1	VAT category code	Coded identification of a VAT category.
156	BT-119	++	0..1	VAT category rate	The VAT rate, represented as percentage that applies for the relevant VAT category.
157	BT-120	++	0..1	VAT exemption reason text	A textual statement of the reason why the amount is exempted from VAT or why no VAT is being charged
158	BT-121	++	0..1	VAT exemption reason code	A coded statement of the reason for why the amount is exempted from VAT.
159	BG-24	+	0..n	ADDITIONAL SUPPORTING DOCUMENTS	A group of business terms providing information about additional supporting documents substantiating the claims made in the Invoice.
160	BT-122	++	1..1	Supporting document reference	An identifier of the supporting document.
161	BT-123	++	0..1	Supporting document description	A description of the supporting document.
162	BT-124	++	0..1	External document location	The URL (Uniform Resource Locator) that identifies where the external document is located.

Line	ID	Level	Card	Business Term	Description
163	BT-125	++	0..1	Attached document	An attached document embedded as binary object or sent together with the invoice.
164			1..1	Attached document Mime code	The mime code of the attached document.
165			1..1	Attached document Filename	The file name of the attached document
166	BG-25	+	1..n	INVOICE LINE	A group of business terms providing information on individual Invoice lines.
167	BT-126	++	1..1	Invoice line identifier	A unique identifier for the individual line within the Invoice.
168	BT-127	++	0..1	Invoice line note	A textual note that gives unstructured information that is relevant to the Invoice line.
169	BT-128	++	0..1	Invoice line object identifier	An identifier for an object on which the invoice line is based, given by the Seller.
170			0..1	Scheme identifier	The identification scheme identifier of the Invoice line object identifier.
171	BT-129	++	1..1	Invoiced quantity	The quantity of items (goods or services) that is charged in the Invoice line.
172	BT-130	++	1..1	Invoiced quantity unit of measure code	The unit of measure that applies to the invoiced quantity.
173	BT-131	++	1..1	Invoice line net amount	The total amount of the Invoice line.
174	BT-132	++	0..1	Referenced purchase order line reference	An identifier for a referenced line within a purchase order, issued by the Buyer.
175	BT-133	++	0..1	Invoice line Buyer accounting reference	A textual value that specifies where to book the relevant data into the Buyer's financial accounts.
176	BG-26	++	0..1	INVOICE LINE PERIOD	A group of business terms providing information about the period relevant for the Invoice line.
177	BT-134	+++	0..1	Invoice line period start date	The date when the Invoice period for this Invoice line starts.
178	BT-135	+++	0..1	Invoice line period end date	The date when the Invoice period for this Invoice line ends.
179	BG-27	++	0..n	INVOICE LINE ALLOWANCES	A group of business terms providing information about allowances applicable to the individual Invoice line.
180	BT-136	+++	1..1	Invoice line allowance amount	The amount of an allowance, without VAT.
181	BT-137	+++	0..1	Invoice line allowance base amount	The base amount that may be used, in conjunction with the Invoice line allowance percentage, to calculate the Invoice line allowance amount.
182	BT-138	+++	0..1	Invoice line allowance percentage	The percentage that may be used, in conjunction with the Invoice line allowance base amount, to calculate the Invoice line allowance amount.
183	BT-139	+++	0..1	Invoice line allowance reason	The reason for the Invoice line allowance, expressed as text.
184	BT-140	+++	0..1	Invoice line allowance reason code	The reason for the Invoice line allowance, expressed as a code.
185	BG-28	++	0..n	INVOICE LINE CHARGES	A group of business terms providing information about charges and taxes other than VAT applicable to the individual Invoice line.
186	BT-141	+++	1..1	Invoice line charge amount	The amount of a charge, without VAT.

OpenPEPPOL AISBL
Rond-point Schuman 6, box 5
1040 Brussels, Belgium

Corporate identification
number 0848.934.496
(Register of Legal Entities Brussels)

info@peppol.eu
www.peppol.eu

Line	ID	Level	Card	Business Term	Description
187	BT-142	+++	0..1	Invoice line charge base amount	The base amount that may be used, in conjunction with the Invoice line charge percentage, to calculate the Invoice line charge amount.
188	BT-143	+++	0..1	Invoice line charge percentage	The percentage that may be used, in conjunction with the Invoice line charge base amount, to calculate the Invoice line charge amount.
189	BT-144	+++	0..1	Invoice line charge reason	The reason for the Invoice line charge, expressed as text.
190	BT-145	+++	0..1	Invoice line charge reason code	The reason for the Invoice line charge, expressed as a code.
191	BG-29	++	1..1	PRICE DETAILS	A group of business terms providing information about the price applied for the goods and services invoiced on the Invoice line.
192	BT-146	+++	1..1	Item net price	The price of an item, exclusive of VAT, after subtracting item price discount.
193	BT-147	+++	0..1	Item price discount	The total discount subtracted from the Item gross price to calculate the Item net price.
194	BT-148	+++	0..1	Item gross price	The unit price, exclusive of VAT, before subtracting Item price discount.
195	BT-149	+++	0..1	Item price base quantity	The number of item units to which the price applies.
196	BT-150	+++	0..1	Item price base quantity unit of measure code	The unit of measure that applies to the Item price base quantity.
197	BG-30	++	1..1	LINE VAT INFORMATION	A group of business terms providing information about the VAT applicable for the goods and services invoiced on the Invoice line.
198	BT-151	+++	1..1	Invoiced item VAT category code	The VAT category code for the invoiced item.
199	BT-152	+++	0..1	Invoiced item VAT rate	The VAT rate, represented as percentage that applies to the invoiced item.
200	BG-31	++	1..1	ITEM INFORMATION	A group of business terms providing information about the goods and services invoiced.
201	BT-153	+++	1..1	Item name	A name for an item.
202	BT-154	+++	0..1	Item description	A description for an item.
203	BT-155	+++	0..1	Item Seller's identifier	An identifier, assigned by the Seller, for the item.
204	BT-156	+++	0..1	Item Buyer's identifier	An identifier, assigned by the Buyer, for the item.
205	BT-157	+++	0..1	Item standard identifier	An item identifier based on a registered scheme.
206			1..1	Scheme identifier	The identification scheme identifier of the Item standard identifier
207	BT-158	+++	0..n	Item classification identifier	A code for classifying the item by its type or nature.
208			1..1	Scheme identifier	The identification scheme identifier of the Item classification identifier
209			0..1	Scheme version identifier	The version of the identification scheme.
210	BT-159	+++	0..1	Item country of origin	The code identifying the country from which the item originates.
211	BG-32	+++	0..n	ITEM ATTRIBUTES	A group of business terms providing information about properties of the goods and services invoiced.
212	BT-160	++++	1..1	Item attribute name	The name of the attribute or property of the item.
213	BT-161	++++	1..1	Item attribute value	The value of the attribute or property of the item.

11.5.   SBDH envelope example

```xml
<StandardBusinessDocument xmlns:xs="http://www.w3.org/2001/XMLSchema"
 xmlns="http://www.unece.org/cefact/namespaces/StandardBusinessDocumentHeader">
 <StandardBusinessDocumentHeader>
  <HeaderVersion>1.0</HeaderVersion>
  <Sender>
   <Identifier Authority="iso6523-actorid-upis">0088:7315458756324</Identifier>
  </Sender>
  <Receiver>
   <Identifier Authority="iso6523-actorid-upis">0088:4562458856624</Identifier>
  </Receiver>
  <DocumentIdentification>
   <Standard>urn:oasis:names:specification:ubl:schema:xsd:Invoice-2</Standard>
   <TypeVersion>2.1</TypeVersion>
   <InstanceIdentifier>123123</InstanceIdentifier>
   <Type>Invoice</Type>
   <CreationDateAndTime>2019-04-25T15:46:10Z</CreationDateAndTime>
  </DocumentIdentification>
  <BusinessScope>
   <Scope>
    <Type>DOCUMENTID</Type>
    <InstanceIdentifier>urn:oasis:names:specification:ubl:schema:xsd:Invoice-2::Invoice##urn:cen.eu:en16931:2017#compliant#urn:fdc:peppol.eu:2017:poacc:billing:3.0::2.1</InstanceIdentifier>
   </Scope>
   <Scope>
    <Type>PROCESSID</Type>
    <InstanceIdentifier>urn:fdc:peppol.eu:2017:poacc:billing:01:1.0</InstanceIdentifier>
   </Scope>
  </BusinessScope>
 </StandardBusinessDocumentHeader>
 <ns4:Invoice xmlns="urn:oasis:names:specification:ubl:schema:xsd:CommonBasicComponents-2" xmlns:ns2="urn:oasis:names:specification:ubl:schema:xsd:CommonExtensionComponents-2"
  xmlns:ns3="urn:oasis:names:specification:ubl:schema:xsd:CommonAggregateComponents-2" xmlns:ns4="urn:oasis:names:specification:ubl:schema:xsd:Invoice-2">
  <!-- etc. -->
 </ns4:Invoice>
</StandardBusinessDocument>
```

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