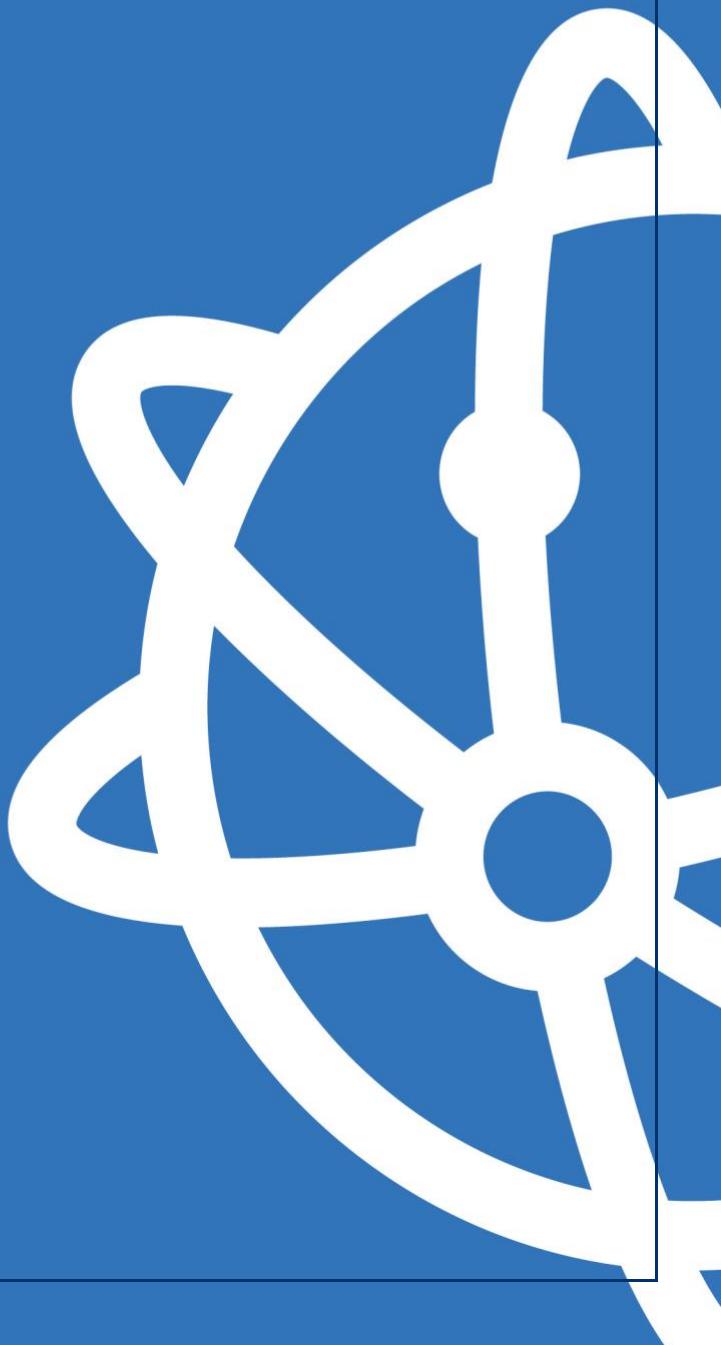
Peppol

The future is open

Peppol Continuous Transaction Controls

Reference Document

September 2021



FOREWORD

Despite the wide adoption of digitalisation in commerce, the exchange of indirect tax data between businesses and tax administrations around the world has long relied on periodic retrospective reporting. Not only is this process inefficient for businesses and tax administrations, it also provides significant opportunities for tax fraud. In 2018, around €140 billion in VAT tax revenue was lost to fraud and evasion.

Many governments around the world have introduced measures, commonly called Continuous Transaction Controls (or CTC), primarily to address their tax losses.

The increasing adoption of the Peppol eInvoice specifications around the world, underpinned by the Peppol Network, provides a unique opportunity to introduce a global solution for CTC that brings benefits to the business community and tax administrations, whilst providing interoperability for domestic and cross-border trading, both for business-to-business and business-to-government trading.

Our analysis of CTC implementations in over 60 countries shows that the various solutions can be broadly categorised into four models, all of which exhibit opportunities for improvement, either for business efficiency or for tax collection.

In January 2020, the OpenPeppol Managing Committee approved a project to develop a technical architecture to meet the requirements of tax administrations and businesses, whilst meeting the requirements for balance, interoperability and efficiency.

We have now successfully completed the project phase and will soon introduce Peppol CTC as a new service domain for Peppol End Users, together with a supporting community of Peppol Service Providers and Tax Administrations.

I would like to thank our project team for their considerable efforts in realising our vision for a global solution for tax data reporting. We have consolidated our learning into this Reference Document and hope that it will provide a valuable resource for everyone with an interest in CTC, whatever their area of interest.

We would welcome all feedback on the Document and look forward to establishing our new CTC Community.

To provide feedback, to learn more, or to join OpenPeppol, please write to us at info@peppol.eu. We look forward to your participation!

André Hoddevik
Secretary General
OpenPeppol

Table of contents

1 Executive summary and recommendations

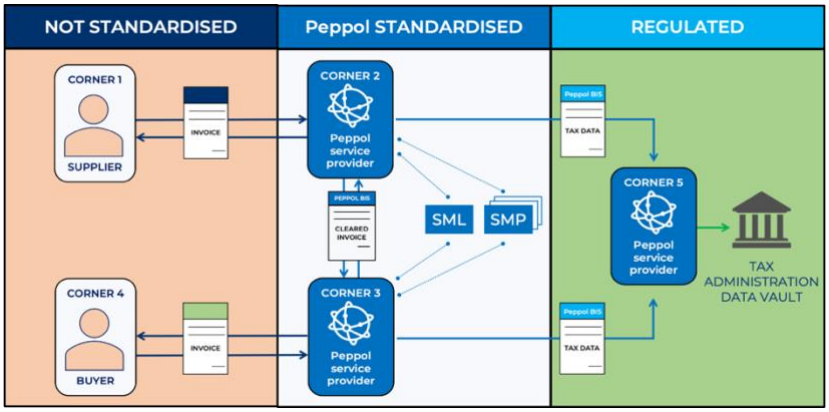
Based on an analysis of various CTC models around the world, the approach recommended by OpenPeppol for the Peppol CTC model is a decentralized pre-clearance/real-time reporting model with regulated exchange.

Peppol CTC provides a non-discriminatory, repeatable and modular scheme that can be deployed using existing technology and infrastructure in multiple jurisdictions in a harmonised way, enabling improved indirect tax controls for both domestic and cross-border operations.

The model will improve communication and data exchange between businesses and tax administrations, enable operational efficiencies and simplify compliance for all parties, producing gains for the global trade and supply chain environment.

While the core elements and orchestration of the Peppol CTC model would be the same across jurisdictions (in the same way as the Peppol 4-corner model), individual governments will be able to select and embed their country-specific requirements, features and localisations. It will also be possible to select pace of implementation, depending on country-specific regulatory and business needs.

Peppol CTC offers a new way to create additional value and benefits on top of real-time electronic document exchange, positively differentiating compared to other existing CTC approaches:



- Balanced. Does not compromise public or private needs, as regulatory compliance requirements are merged with routine business processes.
- Faster and more economic deployment. Building on the existing, familiar and proven Peppol infrastructure utilising UBL standards, it requires shorter planning, testing and deployment times, compared to designing and developing a brand-new CTC schema.
- Evolutionary. Can be extended organically to other document types to meet the specific needs of both regulators and businesses.
- Leverages existing infrastructure. Can be built organically on existing public eInvoicing and procurement infrastructures, or an existing Peppol implementation.
- Interoperable. Based on international best practice and standards, Peppol CTC can be deployed in multiple jurisdictions in a harmonised manner providing national and cross-border benefits for public and private sectors.

2 Scope, target audience and objectives

2.1 Background and purpose

Indirect tax fraud and evasion is a significant problem for many governments around the world. These governments are examining approaches to bring their tax gap under control. One approach is to introduce the so called Continuous Transaction Controls, or CTC, which relies on obtaining data from the tax subject at a transactional level in real or near real-time.

The purpose of this document is to present a new approach to how CTC can be implemented, based on the existing Peppol framework, which has already been adopted in many jurisdictions around the world.

As the adoption of CTC models grows around the world, a lack of harmonisation between jurisdictions, combined with the burden on tax subjects is becoming increasingly problematic. The ambition of this document is to outline an attractive approach that will be more beneficial to all parties impacted by CTCs.

2.2 Target audience

The main target audience for this document is tax administrations, digitalisation agencies and public procurement authorities that, in recent years, have been the main driver behind the implementation of the various CTC schemes. This includes those who have not yet implemented CTC and those who are re-evaluating their existing model to identify areas for improvement.

The document is also relevant for international organisations that promote or work with CTC harmonisation, such as OECD (Organisation for Economic Co-operation and Development), CIAT (Inter-American Center of Tax Administrations), ICC (International Chamber of Commerce), EESPA (European eInvoicing Service Providers Association), BPC (Business Payments Coalition), among others.

Finally, tax subjects, especially businesses, can benefit from reading this document to increase their knowledge of differing CTC models, to prepare for potential developments or even to advocate for a certain CTC model, such as Peppol CTC.

2.3 Varying implementation status

An important note for the reader of this document is that the Implementation of Peppol CTC and practical implications thereof will vary depending on the whether a country has already implemented any of the CTC models, or has selected a given model, or whether CTC is at the stage of consideration.

For this purpose, there are the following four distinct groups:

1) countries, that have already implemented Peppol, including countries that:
    a. have implemented a ‘standard’ Peppol 4-corner approach, meaning that buyers and sellers can freely select their service provider

b. have deployed a central governmental infrastructure with enabled Peppol capabilities

2) countries that have no CTC model in place but are considering one;
3) countries that have a CTC model in place but are evaluating enhancements;
4) countries that have a CTC model in place and are not evaluating changes.

Nevertheless, Peppol CTC can be implemented in most CTC jurisdictions, either partially, as a complementary or enhanced approach, or as a replacement.

It is important to note that implementation of Peppol CTC model does not conflict with or contradict any potential other reporting obligations, that may or will exist in a jurisdiction, including, but not limited to VAT reporting, SAF-T reporting.

3 Indirect tax gap and CTCs

3.1 Introduction

Indirect tax fraud and evasion[1] is a significant problem for the majority of governments around the world. According to the Economic Commission for Latin America and the Caribbean, the cost of tax non-compliance in the region was estimated to US$340 billion in 2015. According to the Taxation and Customs Union Directorate General of the European Commission, the estimated EU VAT gap in 2018 was €140 billion. However, recent figures forecast a potential loss of €164 billion in 2020 due to the effects of the coronavirus pandemic on the economy. All governments are examining approaches to bring these gaps under control.

Continuous Transaction Controls (or CTC) according to the International Chamber of Commerce (ICC) enable law enforcement agencies such as tax administrations, to collect data associated with business activities that are relevant to the exercise of their function. Such data is obtained directly from business transaction processing and/or data management systems, in real-time or near-real-time.

CTC addresses the inefficiencies that have always characterised the use of retroactive (hereinafter called 'post') audit, where auditors can only obtain visibility of a transaction long after its conclusion and exclusively rely on data stored by the entities whose activities they seek to audit.

CTC removes this dependency on a 'static' approach that is based on an evaluation of historical evidence ledgers by a tax subject by making it possible for a tax administration to gather relevant business information in the form of a dynamic business transaction ledger, comprising authenticated transaction source data.

While CTC models differ from one another, sometimes significantly, the common denominator is that a defined transactional document, such as a VAT invoice (or a subset thereof) must be communicated:

[1] There are various definitions of the terms "VAT fraud and evasion". According to the document "The concept of Tax Gaps. Report III: MTIC Fraud Gap estimation methodologies" by FISCALIS 2020 Tax Gap Project Group, subgroup VAT fraud (FPG/041), these terms are defined as follows:

VAT evasion generally comprises illegal arrangements where tax liability is hidden or ignored, i.e. the tax subject pays less tax than he/she is supposed to pay under the law by hiding income or information from the tax administrations.

VAT fraud is a form of deliberate evasion of tax which is generally punishable under criminal law. The term includes situations in which deliberately false statements are submitted or fake documents are produced. It is organised fraud and includes national and cross border transactions.

MTIC fraud is a specific form of VAT fraud. VAT is stolen from a government by organised criminal activity, which exploits cross border trading where the movement of goods between jurisdictions is VAT-free. This allows the fraudster (the person who commits fraud) to charge VAT on the sale of goods, and then instead of paying this to the government's collection authority, simply disappear, taking the VAT with him.

- in a predefined format
- utilising a predefined infrastructure(s)
- without additional manual intervention
- in real-time or near-real-time

The introduction of CTC has grown significantly on recent years, and this trend highlights the need to identify which CTC model is the most optimal and balanced.

Already, governments in Europe, Asia, Australia and New Zealand utilise the Peppol Business Interoperability Specifications (BIS) and the Peppol Network to receive millions of electronic invoices from businesses (B2G), as well as enabling businesses to invoice each other electronically (B2B). This provides considerable benefits for buyers and sellers. However, the Peppol approach also provides a solid foundation for governments to implement digital controls to simultaneously prevent loss of tax revenues and further increase business efficiency.

Based on the available insights into the existing CTC models around the world, combined with expertise and input from tax administrations and industry, this document sets out a new CTC model, utilising the existing Peppol Network, that does not compromise between the needs of both public and private sectors and brings a unified standards infrastructure allowing for valid jurisdictional variation.

3.2 Existing CTC and eDocument exchange models

This section provides a high-level overview of the primary CTC and eDocument exchange models. A summary of the research and findings from comparing CTC models being implemented around the world, with examples from South America, Europe and Asia-Pacific can be found at Annex I.

Although CTC and eDocument exchange models are country-specific and vary from each other in detail, they can be grouped based on their most typical features:

- Interoperability model
- Real-time Invoice Reporting model
- Centralised Exchange model
- Clearance model

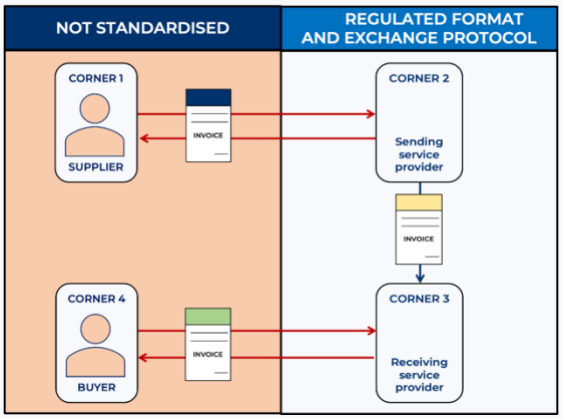
Typically, existing CTC implementations are not based on global standards, do not address cross-border trade and impose an additional burden on business.

3.2.1 *Interoperability model*

This model utilises a network of private service providers, where the regulator focuses on establishing a unified document format and exchange methodology for businesses to gain efficiencies and for regulators to perform audit and analysis.

Key features

- government agency establishes technical rules that must be followed by tax subjects for issue, exchange and receipt of eDocument(s)
- data can be made available for audit in unified and structured format
- permits automation of AR and AP processes
- permits exchange of related document types, such as purchase orders



Implementation variations

- domestic proprietary technical requirements for interoperability
- international Peppol standards with country-specific adaptations

Example countries

- many EU member states, Australia, Russia, Singapore, Switzerland

Key challenges

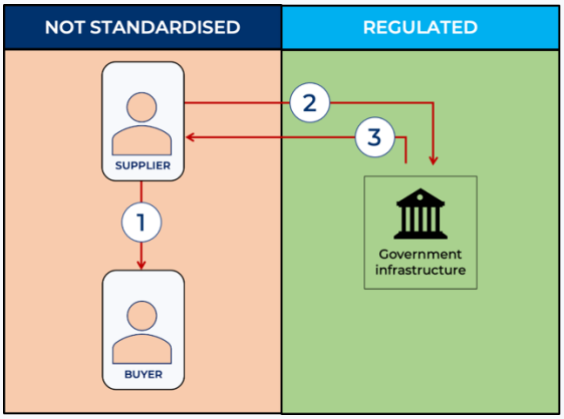
- has not currently been leveraged for real-time tax controls
- despite common principles, country-specific adaptations may be required

3.2.2 *Real-time invoice reporting model*

The tax subject reports the invoice, or a subset thereof, to a government agency shortly after the issue and exchange of an invoice between the trading parties.

Key features

- central platform established by tax administration
- requires use of accredited software solutions
- businesses submit a subset of invoice data with 24-72 hours of invoice issue
- mandatory mainly for larger businesses



Implementation variations

- submitted dataset can be generated fully from the data in the invoice
- sumitted dataset requires data not available in the invoice
- varying reporting speed and from within 24 hours to within a week

Example countries

- Hungary, South Korea

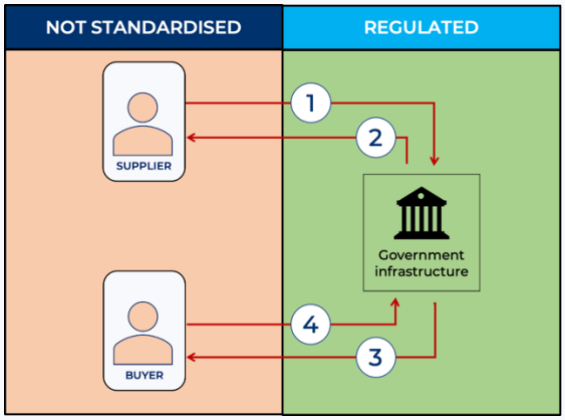
Key challenges

- eInvoicing is not regulated, with paper or PDF being most common formats
- tax subject must implement different solutions and processes: one for real-time reporting and another for eInvoicing
- may require data betond that typically contained in the invoice, increasing the initial investment cost and of ongoing maintenance costs

3.2.3 Centralised exchange model

This model tends to be either tax or procurement focused and ultimately prohibits a direct exchange of the regulated document(s) between the trading parties.

Key features



- central platform established by a government agency
- eInvoices are exchanged between buyers and sellers through a central platform
- the central platform has the right to validate transactions

Implementation variations

- central platform, with Peppol connectivity
- central platform, without Peppol connectivity

Example countries

- Italy, Kazakhstan, Turkey

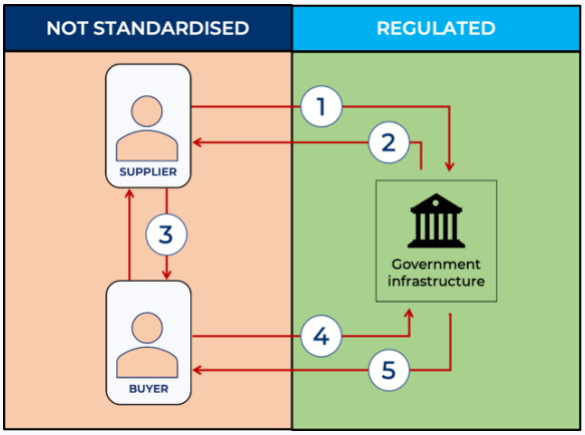
Key challenges

- document format set by the needs of the procurement/tax administration
- no interoperability between buyers and sellers
- requires intermediary service providers between the platform and business
- inhibits automation of accounts receivable and accounts payable functions
- separate solution and process needed for related documents, such as purchase orders or commercial invoices (sometimes issued between the trading parties to overcome the invoice format limitations)

3.2.4 Clearance models

This model may provide invoice clearance (fiscal validation and approval) before or after issue of the invoice to the supplier. Clearance may be provided by a central platform or by a network of accredited service providers. Document exchange takes place directly between tax subjects but is not regulated.

Key features



- central data repository established by tax administration
- tax administration specifies a structured invoice format to be used by tax subjects
- supplier submits the invoice to a designated platform to obtain clearance (fiscal validity) of the document
- designated platform clears (gives fiscal validity) the invoice, then the supplier sends the invoice to the buyer
- buyer validates (controls fiscal validity) the invoice with the designated platform prior to payment

Implementation variations

- pre and post clearance (see variations below).
- centralised and decentralised clearance (see variations below).

Example countries

- Brazil, Chile, Colombia, Mexico, Peru

Key challenges:

- document format focused to the needs of the tax administration
- no interoperability between buyers and sellers, with eMail being the predominant exchange mechanism
- requires intermediary service providers between the platform and business
- inhibits automation of accounts receivable and accounts payable functions

Clearance model variations

Pre-clearance (also referred to as hard clearance) – where invoice clearance occurs prior to exchange between tax subjects

Post-clearance (also referred to as soft clearance) – where invoice clearance may occur in a short timeframe after the exchange between tax subjects.

Centralised Clearance – where clearance is performed by the centralised infrastructure deployed by the tax administration

Decentralised Clearance – where the tax administration has outsourced the clearance process to accredited service providers. The service providers, upon clearance, communicate invoice data to the platform of the tax authority.

Examples of implementation variations of the invoice clearance model:

Pre-clearance	Brazil Colombia	Mexico
Post-clearance	Chile Costa Rica	Peru
	Centralised Clearance	Decentralised Clearance

4 Overarching requirements and considerations

This section outlines various overarching requirements and considerations for a CTC model, taken from both the public and private sector perspectives. These have taken into account when developing the Peppol CTC model. In creating this list of requirements, we have taken into account feedback provided by various tax administrations, international organisations and businesses. Significant inspiration has been taken from the International Chamber of Commerce document *Practice Principles for Implementation of CTCs*[2], published in June 2020.

How more detailed business requirements have been addressed in Peppol CTC is further outlined in Section 6 Business requirements.

4.1 Public sector considerations

Ensuring financial basis for the public activities. A primary goal for each tax administration is to ensure that there is a financial basis to fund public activities, such as education, healthcare, security and so on. In this respect, an efficient control mechanism over the (indirect) tax assessment, reporting and settlement is required. The ability to come closer to such data at the moment of its creation gives tax administrations better tools and mechanisms to manage public finances.

Combating the indirect tax gap. Indirect tax fraud and evasion is a significant problem for many tax administrations and a CTC model should provide the tools to combat this issue. Depending on their design, CTC models, besides providing transactional data to tax administrations in real-time, can provide information on whether the document has actually been exchanged between the trading parties and whether ot not the buyer accepted or rejected the invoice, helping to prevent indirect tax fraud and evasion. Additional controls, such as three-way matching, can be deployed to prevent cross-border or intra-community indirect tax carousels.

Creating a harmonised cross-border approach. Country-specific CTC models and technical standards should be eliminated, enabling tax administrations across jurisdictions to more efficiently control and exchange data across borders.

Helping tax subjects to comply with indirect tax rules. Getting data right from the beginning is a challenge, both for tax subjects and tax administrations. CTC should enable tax subjects to comply with indirect tax rules at the point when they create (issue) fiscally relevant invoice transactions.

Reducing costs for tax compliance for both the public and private sectors. While multiple technologies and digital controls aim to ensure businesses compliance with regulatory requirements, they typically diverge, often significantly, increasing compliance costs for businesses and tax administrations. A CTC model should be

[2]https://iccwbo.org/publication/icc-continuous-transaction-control-ctcs-practice-principles/

designed in a way where business and fiscal compliance becomes a single streamlined process to reduce costs for both public and private sectors.

Ease of implementation and maintenance. A CTC model should be designed in a way that makes it easy to be implemented both by large and small tax subjects. This would ensure easier adoption in the country, irrespective of the approach chosen to implement CTC, whether voluntary / benefit based or imperative way.

Increasing country-wide overall business efficiency. Digital technologies can be used not only for the purpose of improving the fiscal compliance of the businesses, but to improve the overall efficiencies for the tax subjects, as well as to drive the overall economic growth in a country. CTCs should, therefore, build on processes and technologies beneficial to the business side.

Enhancing public procurement. Public procurement expenditure is a significant item for the budget of every country. CTC should be designed to enhance public procurement processes and achieve better control of expenditure.

4.2 Private sector considerations

'Provide data only once' principle. A CTC model should not contribute to or create a situation, where the same data is provided by the tax subjects multiple times to tax and other public or law enforcement authorities. CTC should replace equivalent preexisting requirements.

Leveraging existing processes. Ideally, CTC should be embedded in existing business processes, as opposed to creating new or additional processes, which might result in unplanned investments, expenses, or changes to the tax subjects' current operations, without necessarily bringing an any business benefit.

Consistency. CTC should be consistent and remain stable over time and be consistent across different variants of CTC (B2B, B2G, B2C etc) within a jurisdiction.

Interoperability. CTC should be interoperable within jurisdictions from a business, legal, technical and operational perspective.

Harmonisation. CTC should be harmonised and uniform in technical, legal and process specifications, both in domestic and international scenarios, aiming to satisfy both public and private sector needs. Where CTC are deployed, the design should, where possible, use standards for data, security and transmission protocols that are already widely deployed in practice.

Robustness and continuity. CTC systems should be operationally stable, maintain appropriate response and processing times, publish service level agreements, communicate effectively in case of problems in meeting such service levels.

No single point of failure. To ensure business continuity, a CTC model should ensure that there is no single point of failure. This can be achieved by deployment of an autonomous and independent CTC architecture.

5 Introduction to Peppol CTC

This section outlines the:

- core principles of the Peppol CTC model
- key features of the Peppol CTC model
- customisation possibilities within the Peppol CTC model
- advantages of delegation approach within the Peppol CTC model
- division of responsibilities in the Peppol CTC model

Understanding the CTC models and their variations already presented in section 3.2, along with the detailed overview in Appendices 2–5, is necessary to comprehend how the Peppol CTC model has been designed and why certain aspects are shaped in a certain way. The Peppol CTC model combines proven elements from various CTC models in conjunction with the existing Peppol infrastructure to provide a reliable and secure CTC solution that can be deployed in multiple jurisdictions.

5.1 Core principles

Peppol CTC model has been designed based on the following set of principles:

- balance and proportionality
- flexibility and customisation options
- efficiency and harmonisation
- based on available and familiar technologies
- trade and supply chain impact

Balance and proportionality. The model should address the legitimate interest of both government and business, so that both sides benefit from the introduction of CTC. The government side should be able to pursue key goals, such as reducing the indirect tax gap and optimising government expenditure, while the business side should improve process optimisation, automation and, potentially, be released from pre-existing obligations that become redundant in the light of CTC.

A sound balance is needed for the sharing of both business and private data. While businesses may exchange significant volumes of information with each other, the data required by the government to execute oversight or control is less extensive, so proportionality must be ensured in a potential CTC model.

Flexibility and resilience. The new model must be flexible, meaning that businesses are able to select ways and methods to comply with the new requirements, so that their existing processes and established best practices are not disrupted to the detriment of the overall benefit.

The CTC model must be based upon an underlying robust infrastructure that is stable, maintains required uptimes, provides issue resolution mechanisms, allows for business continuity in the event of disruption and enables different types of businesses to connect in multiple ways depending on their needs, preferences, and capabilities. Further, the model has been designed in a way to limit dependencies between different components of the model on each other.

Efficiency and harmonisation. The model should be designed to ensure maximum benefits for both private and public sectors. CTC implementations should leverage existing or best practice processes already implemented by businesses, thereby minimising any additional burden and, where possible, remove or replace redundant pre-existing controls. CTC measures should be harmonised across geographic or sectoral obligations, thereby avoiding silos and parallel processes.

Available and familiar technologies. When considering implementation of CTC, authorities should review and assess technologies and processes already available or otherwise familiar to business. Many companies have invested or plan to invest significant funds into automation and rationalisation of their operations by acquiring new technical solutions. Authorities should analyse and review the suitability of such technologies for their requirements when implementing CTC.

Technologies are available in the market that can ensure fulfilment of the needs of both the private and public sectors, without causing unnecessary disruption to planned or implemented processes. In designing and implementing CTC, authorities should assess existing technologies and work closely with experts and representatives from business to find the most optimal and balanced solution.

Trade and supply chain impact. To avoid negative impacts on trade and the supporting supply chains, CTC should be designed and implemented in a way to uphold non-discriminatory treatment of tax subject groups within the jurisdiction.

It should be possible for non-domestic companies and their technology, logistics and other service providers to comply with applicable CTC requirements, thereby avoiding a restriction of competition in the service provider community.

When certification, accreditation or other approvals are required for connecting to CTC platforms, such approvals should not be restricted to local solution vendors, nor should non-resident vendors have to unreasonably 'localise' their operations.

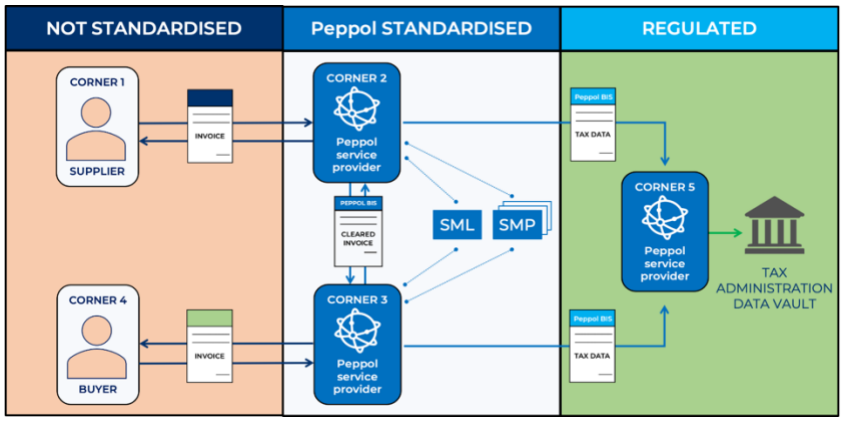
To encourage cross-border trade, geographical harmonisation of CTC models should be sought, so that interoperability between jurisdictions from a business, legal, technical and operational perspective remain intact. This allows businesses to comply with cross-border obligations in multiple jurisdictions, utilising existing processes and service or technology providers

5.2 Overview

In comparison with other CTC models, the Peppol CTC model can be described as a **decentralised CTC model with regulated document exchange**.

This is a hybrid model that combines the best proven elements of existing CTC models outlined in section 3.2 and appendices 2-5 to this document. The main elements from an architecture perspective can be described as follows:

- Corner 2 Service Provider (C2) and Corner 3 Service Provider (C3) must pass CTC certification, as per requirements set by the Tax Administration (TA) in a specific jurisdiction
- C2 performs business document validations in real-time, ensuring compliance with local requirements. Thereafter C2 reports, in real-time, the complete business document or a tax subset thereof (Tax Data Document or TDD) to the Corner 5 Service Provider (C5) designated by the TA. When performing validation, C2 confirms compliance[3] with the standard Peppol content validation requirements (that are based on country-specific indirect tax content requirements) and any additional country-specific validation requirements (eg, beyond what is expressed in the indirect tax regulations) set by the TA



- C2 sends the validated business document to C3 in real-time
- C3, upon receipt of the business document, validates it and creates a TDD, according to the requirements set by the TA, and reports the TDD in real-time to C5. Validation and reporting by C5 is a feature for the local TA to decide whether or when to deploy[4]
- the business document format and exchange mechanism between C2 and C3, acting on behalf of the seller (C1) and the buyer (C4) respectively, is defined and regulated within Peppol, providing C5 with certainty that document exchange between the trading parties actually took place and the exchange was secure, ensuring that TA can utilise the received data
- C4 can be assigned the responsibility to send return communication, such as rejection or approval (invoice response) of the received business document, to C1 (and optionally to C5), to further provide authenticity of the transaction. Invoice response is a feature for the TA to decide whether or when to deploy
- Business document exchange between C1 and C4, and data collection and fiscal control (C5) are performed as a single real-time process.

3 See section 6.7.7. Legal Certainty

4 More opt-in features are described further in the document

5.3 Customisations

The Peppol CTC model has been designed to make it highly customisable, depending on country-specific needs or requirements. The customisation possibilities are outlined in detail throughout Section 6 Business Requirements and Section 6.10 Incremental Deployment, but can be summarised as follows:

- document types: invoice, order, despatch advice, payment, etc
- scope and deployment pace: B2B, B2G, B2C, domestic, cross-border
- eTax subject registry: identification, registration
- document format: between tax subjects/service providers/tax administrations
- document content and validations: business and reporting documents
- trust and controls: CTC certification, eSignatures, SLA
- data safeguarding: data minimisation, end-to-end security
- localisation: support, language, data residency

5.4 Decentralised clearance

While recognising that there will be a governmental platform to meet the goals and purpose of a CTC model, we advocate a delegated validation approach, where certified service providers ensure compliance with the relevant local regulations.

While there are examples where a central platform undertakes clearance and validation of the exchanged documents, and even actual document exchange, the reasons in preference for a delegated clearance model are:

Delegated clearance is a proven approach. While not the most widespread, the approach where the tax administration has delegated some functions, such as clearance to certified service providers, has been proven to work.

The most prominent examples are Mexico and Peru, who have implemented frameworks for PAC[5] and OSE[6] respectively, where private entities undertake the performance of 'heavy' actions, such as the fiscal validation of issued documents, ensuing integrity and authenticity of the documents and reporting data in real-time to the data vault of the tax authority, SAT and SUNAT respectively.

Role of service providers. While many CTC models expect tax subjects to connect with a central platform to comply with fiscal regulations, in practice, only small businesses interact with the platform directly typically using a web portal provided by the tax administration, enabling manual entry of invoice data. Larger businesses

[5] https://www.sat.gob.mx/consulta/76969/proveedores-autorizados-de-certificacion-(pac´s)-

[6] https://cpe.sunat.gob.pe/informacion_general/operador_servicios_electronicos

tend to contract the services of third-party service providers that specialise in eDocument exchange services, including connection to government platforms.

Maintaining legal and technical compliance, especially across multiple jurisdictions, becomes increasingly challenging for businesses, encouraging them further to outsource this role (partially or fully) to specialised vendors. This is also the case for the Centralised Exchange models (eg, Italy or Turkey) where, despite the option to connect directly with the mandatory infrastructure, businesses typically choose to contract a specialised vendor. It is not unfamiliar for tax subjects to technically interact with intermediaries, such as CTC Service Providers, to ensure compliance. Further, a decision to contract a service provider is, usually, tightly connected with other value-added services offered by such providers. Additional services include Order-to-Cash and Purchase-to-Pay automation, compliance, financing, payments, analytics, accounting, interoperability, etc. Appendix 7 further elaborates on service provider roles.

Data minimisation. A key requirement and challenge with a CTC model is the type and quantity of the data that will be collected by the governmental infrastructure. Decisions are required regarding:

- the legitimate interest of data needed for collection and analysis by TAs
- data allowed to be collected under the existing data privacy regulations
- data that may constitute trade or commercial secrets of the business

The delegated clearance approach addresses this issue, where C5 defines the data that can be harvested from the complete business document by C2 and C3 collection and processing under the regulations of the jurisdiction. C2 and C3 will only submit data to C5 in accordance with established legal parameters, ensuring compliance with applicable data minimisation principles and regulations.

Ensuring immediate purpose of the governmental platform. It is important that each party dedicates resources within its competencies. A core competence of the tax administration is the oversight of tax collection. It Is, therefore, our view that tax administrations should primarily focus on establishing an appropriate regulatory framework and data analytics capability within the CTC model, and not become the actual infrastructure provider for document validation and/or exchange. This aspect of a CTC model can be delegated to expert players, who already specialise in such activities and have the necessary infrastructure to operate within a clear framework, under tax administration scrutiny.

Process optimisation for businesses. Peppol service providers already perform advanced validation, authentication, and security processes on behalf of trading parties. It will be more cost effective to place additional requirements on service providers, instead of establishing a separate model that would duplicate or hinder many existing processes and increase implementation and maintenance costs for tax subjects. For the tax subject, in Peppol CTC, eInvoicing and eReporting would become a single operation performed via the same technical channel.

Uninterrupted supply chain and trade. From a supply chain and trade perspective, it is crucial to streamline processes. If business-critical operations can be combined with fiscal or other public responsibilities, this will lower the burden on businesses. Additionally, if processes and infrastructures can be harmonised over several jurisdictions, it will have a positive impact on both cross-border trade and the ability of governments to ensure fiscal compliance, which otherwise is typically challenging. Use of Peppol service providers, who already help businesses meet local compliance requirements, can ensure that such processes are streamlined and performed as a single process from the tax subject perspective.

Utilisation of existing eInvoicing or eProcurement infrastructure. Some countries may have already invested in eInvoicing or public procurement infrastructures. The delegated clearance approach would leverage such investment, as the existing infrastructure could be embedded in the Peppol CTC model. This infrastructure could become a CTC-certified Service Provider to serve, for example, already connected contracting authorities. The investment required would be lower compared to extending the capabilities of an existing infrastrucure to become a central clearance and/or exchange platform.

5.5 Division of responsibilities

The tables below and overleaf outline the division of responsibilities between the TA on one hand and C2 and C3 on the other. C5 is omitted from the tables, as it will act as the technical infrastructure receivinge data from Service Providers at C2/C3.

BD content		C2	C3	TA
1	Minimum content for the exchanged document, based on indirect tax legislation	Ensures[7] and reports to TA	Confirms and reports to TA	Sets technical requirements based on regulatory and Peppol framework
2	Minimum content for the exchanged document, based on other legislation	Ensures and reports to TA	Confirms and reports to TA	Sets technical requirements based on regulatory and Peppol framework

[7] Where compliance with certain requirements is with the issuer or both parties, the term “ensures” has been used. The term “confirms” has been used where the party may want to control the correctness of some aspects

BD processing (C1 to C4)		C2	C3	TA
3	SMP registration	Ensures (optionally[8])	Ensures (optionally)	Sets registration framework
4	Format of the BD exchanged between C2 and C3, and conversion to C1 and C4 formats respectively	Ensures	Ensures	Sets local variation based on Peppol framework
5	Computational correctness and integrity	Ensures	Confirms	Sets local variation based on Peppol framework
6	Transaction integrity and authenticity	Ensures	Ensures	Implements Peppol CTC framework
7	Requirements for human-readable rendition of machine-readable file	Ensures (optionally)	Ensures (optionally)	Ensures availability and/or conformance of regulatory framework
8	BD exchange between tax subjects	Sends	Receives	Implements Peppol CTC framework
9	Archiving	Supports (optionally[9])	Supports (optionally)	Ensures availability and/or conformance of regulatory framework

Contractual requirements (towards C1 and C4)		C2	C3	TA
10	Agreement regarding clearance, validation and reporting services	Ensures	Ensures	Sets framework and requirements
11	Agreement regarding document exchange (sending /receiving)	Ensures	Ensures	Implements Peppol CTC Framework

[8] In the context of SMP registration, the division of responsibilities will differ depending on the approach chosen in the specific jurisdiction. For example, the CTC SPs can perform the registration, or the tax subjects can register themselves. The actual mechanism will also depend on whether TA adopt a centralised or decentralised SMP

[9] Marked as optional, as the tax subject might have an existing archiving solution, which they want to continue using to ensure continuity of the archiving processes

Real-time communication with C5		C2	C3	TA
12	Document validation/clearance	Ensures	NA	Sets technical requirements based on regulatory framework
13	Tax data real-time reporting of issued BD to C5 SP	Ensures	NA	Sets technical requirements based on regulatory framework and receives the report
14	Tax data real-time reporting of received BD to C5 SP	NA	Ensures	Sets technical requirements based on regulatory framework and receives the report
15	Tax data document format	Ensures	Ensures	Sets technical requirements based on regulatory framework

Data handling		C2	C3	TA
16	Data privacy compliance	Data processor for C1 Independent data processor towards C3 & C5	Data processor for C4 Independent data processor towards C2 & C5	Sets framework to ensure compliance with the applicable data protection regulations
17	Other considerations, eg, sharing with C5 of data that might be considered as trade or commercial secrets, etc.	Ensures compliance	Ensures compliance	Sets framework to ensure compliance with relevant regulations and business considerations

6 Business requirements

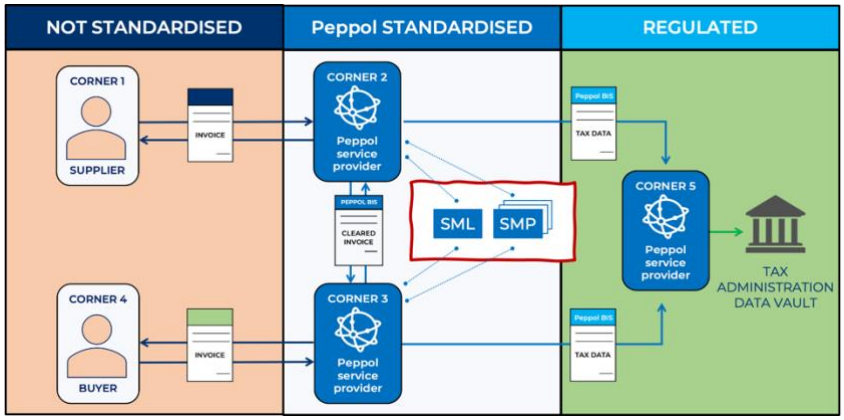
This section represents an overview of various business requirements needed for the Peppol CTC model, including a description of how they have been addressed. For architectural and technical details, refer to section 7 Architecture.

6.1 Identification of Tax Subjects (buyers and suppliers)

The Peppol Network is based on dynamic addressing, where SPs list, in an SMP

- their customers capabilities to receive specific document types
- the technical delivery address for each customer

Registration of a tax subject in an SMP enables real-time identification of the receiver (C4) and its technical capabilities, allowing for instant and secure document exchange between the trading parties (C1 and C4).



Information about which SMP holds information about a receiver is listed in an SML. There is one SML in the entire Peppol Network (ensuring the ability to perform cross-border transactions) and multiple SMPs (either single per the whole jurisdiction or per SP), which combine as an address book.

Looking at the experience from countries that already have implemented a CTC mandate, a single SMP per jurisdiction is advisable, so that C5/TA obtain full control of all 'digital' tax subjects. In a CTC mandate, all trading parties (both buyers and sellers) should register in this single SMP. A single SMP does not have to replace any existing registry in the country but can combine information from existing registries to facilitate tax subject onboarding and further controls.

This single SMP, holding information about the tax subjects, can be hosted within the country borders, should that be a requirement. In this way, it is possible to ensure the cross-border advantages of Peppol and maintain data sovereignty.

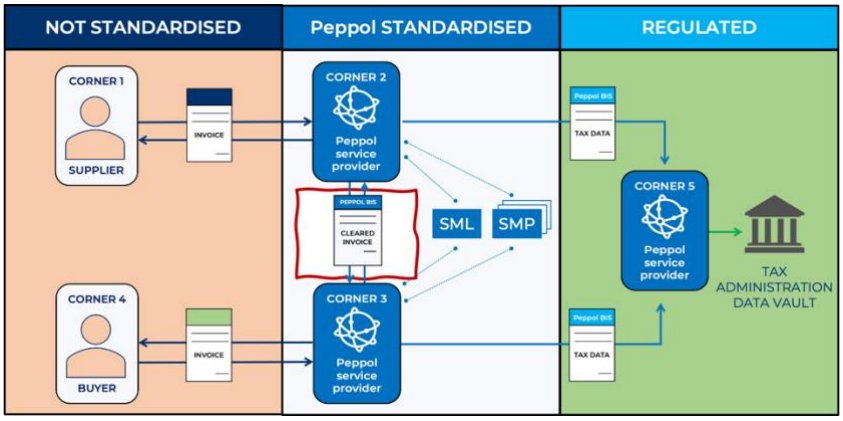
6.2 Document content

It is necessary to differentiate between two distinct document types:

- Business Document (BD), which will be exchanged between the trading parties C1 and C4, via C2 and C3 respectively
- Tax Data Document (TDD), which is either the complete BD, or a subset thereof, created and sent by CTC SPs (both C2 and C3) to the C5 SP.

6.2.1 *Business Document (BD)*

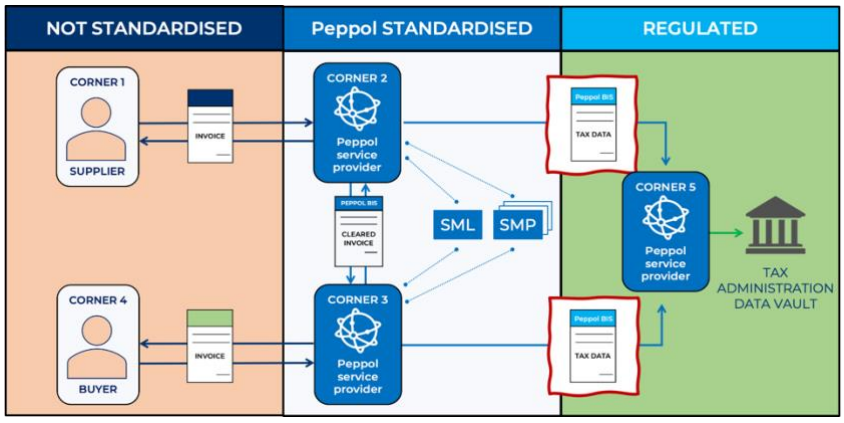
BD content is defined and evolved, based on member needs by the OpenPeppol community, to comply with the requirements of indirect tax and other relevant regulations. Working with OpenPeppol, the TA will define the content of the Business document to be validated by C2 and C3 prior to exchange between the trading parties and submission to C5 through the TDD. The content validation requirements should constitute the minimum content of the Peppol BIS document. Such validations will ensure that the tax data of a BD is correct from the beginning, both from the Tax Subject and TA perspective.



In the context of Peppol CTC, the exchange of BDs during everyday operations is the only operation that the Tax Subject must ensure, given that the TDD (outlined below) is something that the C2 will create and maintain.

6.2.2 *Tax Data Document (TDD)*

The TA will define the data to be submitted to C5, as the TDD. The data content could correspond to the data identified as the minimum mandatory requirement for the Business Document, or a subset thereof. Ideally, for data protection and confidentiality, the preferred option is that the TDD should be a subset of the BD. To achieve the necessary matching and data certainty, the TA can define the data to be reported in real-time by C2 and C3 respectively, as the extent of validations performed by C2 and C3 respectively will differ.



Having different validation requirements by C3 will be especially critical if cross-border documents are reported to C5 by C3, as non-domestic invoices will not have the same document content as a domestic transaction. For cross-border Tax Subjects (C1/C4), the TDD is not typically something they need to comply with.

6.2.3 *Adaptations to BD and TDD content*

Peppol CTC provides specifications for both the content of the BD and TDD for each jurisdiction, where Peppol Network has been deployed. However, it may be that, in a new jurisdiction or due to changes in an existing jurisdiction, content requirements are not covered by the existing Peppol specifications.

In such an event, the TA with OpenPeppol can create an extension to Peppol specifications, to ensure that such requirements can be included in BD and TDD.

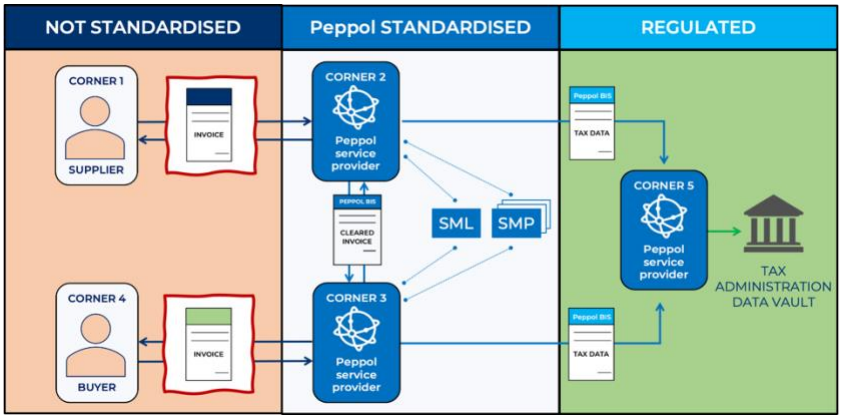
6.3 Document format

To ensure that the business and operational needs of multiple parties (tax subjects and tax administrations) are met, Peppol CTC differentiates between three distinct areas for the technical specification of the format of the exchanged documents:

- format of the document between C1/C2 and C3/C4
- format of the document between C2 and C3
- format of the document between C2/C3 and C5

6.3.1 *Between Tax Subjects and Service Providers*

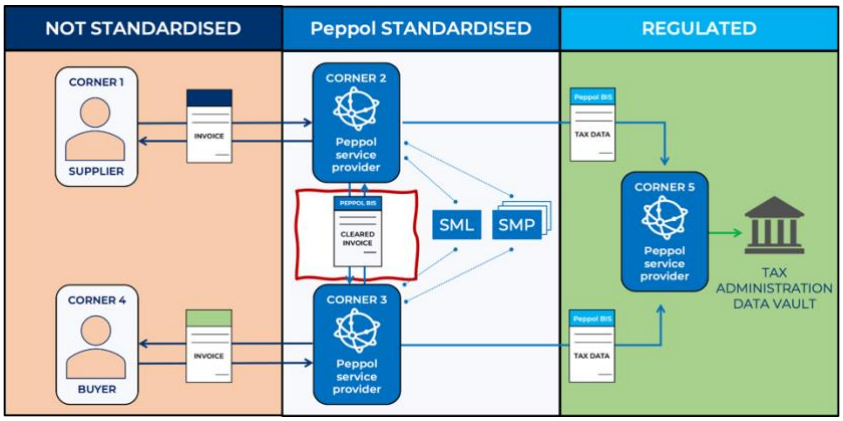
The format in which documents are exchanged between C1 and C2, and then between C3 and C4 is not regulated in the Peppol Network, giving Tax Subjects freedom to work with their existing processes and formats. C1/C4 have several options how to proceed in this respect. They can either provide Peppol BIS or provide another format to their SP, who will perform conversion to Peppol BIS. Further, SPs usually offer a web portal option to businesses (to provide document data by manual keying) or data capture services to convert image-based files into Peppol BIS.



Regulating the format of the document to be exchanged between C1/C2 and C3/C4 would have a negative impact on the speed of adoption of CTC; create increased costs that otherwise could be avoided; disrupt established processes; or create unwanted lock-in effects when C1 or C4 wants to change Service Provider.

6.3.2 Between C2 and C3

Peppol BIS standardises electronic documents for exchange over the Peppol Network. Peppol BIS builds on the work of the CEN Workshop on Business Interoperability Interfaces for Public Procurement in Europe (CEN BII) and is maintained by OpenPeppol. It is mandatory for all Peppol-certified Service Providers to support Peppol BIS.



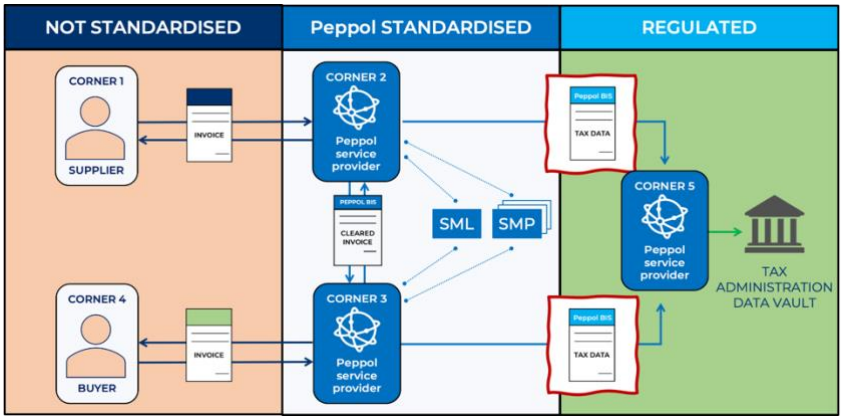
In this context, OpenPeppol provides standardised support for:

- Peppol BIS, which utilises the Universal Business Language (UBL – ISO/IEC 19845), providing compliance with EN 16931 in the EU
- product catalogue; order; order confirmation; despatch advice; invoice; invoice response.

The use of Peppol BIS by Service Providers should be prescribed. Country specific versions of Peppol BIS may be implemented to ensure indirect tax compliance from a document content perspective. However, the underlying Peppol BIS remains common for all jurisdictions that have chosen the Peppol Network for document exchange. Such local regulation should only introduce the minimum content standard necessary to fulfil government needs, leaving freedom for Tax Subjects to provide further content via the Peppol BIS specifications.

6.3.3 Between C2/C3 and C5

We expect the TDD to be submitted by C2/C3 to C5 will build upon Peppol BIS from a content perspective, ie, all data should be present in the exchanged BD. This facilitates a local decision whether the TDD should build upon Peppol BIS or utilise a local XML format.



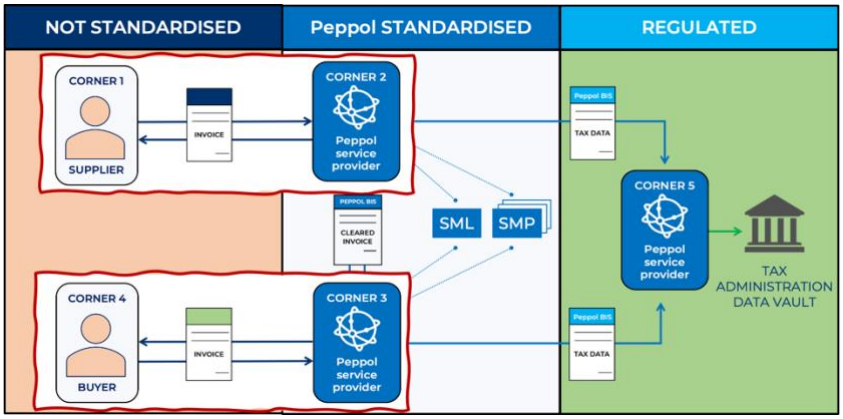
Using Peppol BIS, instead of other formats, for TDD offers two key advantages:

- scalability and speed of deployment in multiple markets
- simplification, standardisation, and interoperability in multiple jurisdictions

The TA should decide whether to prescribe the use of Peppol BIS or another format for TDD. To enable greater Interoperability between different jurisdictions and tax administrations, Peppol BIS can be used as the default format for the TDD.

6.3.4 Graphical presentation

It is common, especially for SMEs, to work with image based electronic documents, that are easy to review and process by human eye. An image-based (eg, PDF) invoice is, essentially, not needed in the Peppol Network for document exchange between Tax Subjects, as Service Providers often create a graphic presentation for their customers as a standard offering, either as a human-readable file (such as PDF) or by presenting directly in a user-friendly web interface.



Where image-based presentation of the BD is required in a specific jurisdiction, this can be resolved by requiring SPs to create presentations for their respective customers or by embedding such presentation in the exchanged Peppol BD.

6.4 Document exchange

Building on the previous section relating to document format, Peppol can differentiate between the three points where document exchange takes place, which is ensures that the operational needs and efficiencies of each party involved in a transaction are met.

6.4.1 Between Tax Subjects and Service Providers

As with document format, the method of technical connection in the Peppol Network between Tax Subjects (C1/C4) and service providers (C2/3) is not regulated in Peppol, giving the Tax Subject the greatest flexibility possible to ensure smooth and frictionless functioning of Its existing processes. This is also applies to Peppol CTC, ensuring that any adoption barriers are as low as possible.

From a practical experience, we can see that service providers offer their customers the following communication and interaction options:

- Web portal and e-mail for manual processing
- AS2, AS4, SFTP or other secure communication protocols
- REST and SOAP APIs

6.4.2 *Between C2 and C3*

Document exchange between C2 and C3 In Peppol Network Is strictly regulated and is the case in Peppol CTC, ensuring the highest levels of standardisation, speed, security, and quality of the process.

As standard, all service providers must use the AS4 communication protocol, to become and remain certified to operate within Peppol Network.

6.4.3 *Between C2/C3 and C5*

As with the requirements for the format to be used for TDD, there are several options at hand for how C2/C3 can exchange data with C5.

OpenPeppol uses the AS4 communication protocol as a default standard, which will ensure faster implementation and deployment of Peppol CTC in a specific jurisdiction. This is the recommended and preferred approach especially for the jurisdictions that have not already deployed CTC, as it enables faster deployment and creates interoperability among tax administrations in various jurisdictions.

6.5 Document types

For implementation of an efficient and future-proof CTC model, it is important that the system is flexible and supports multiple document types. On one hand, this provides a TA with the possibility to incrementally extend the scope of the potential mandatory usage to other document types beyond invoice, with limited impact on businesses. This would also ensure that Tax Subjects are using single processes and systems both for meeting their business needs and eventual compliance requirements in their jurisdiction, while leveraging regulations for general digitalisation and increased efficiencies in their operations.

6.5.1 *Supported document types*

The Peppol Network already supports multiple document types for Order-to-Cash (O2C) and Purchase-to-Pay (P2P) purposes including, but not limited to:

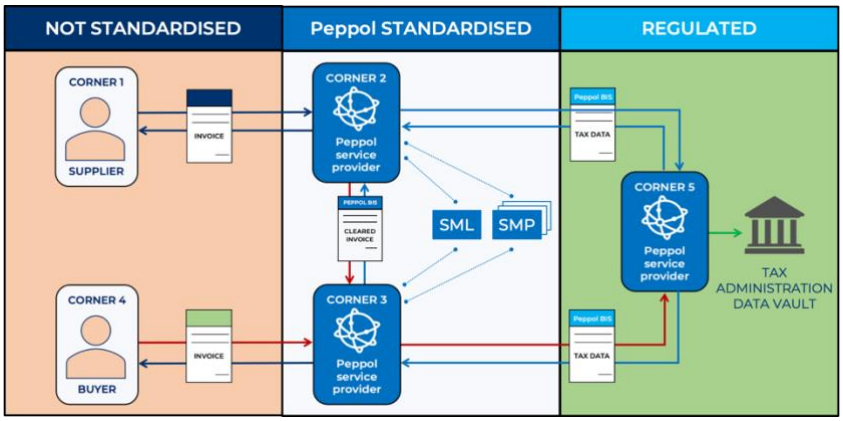
- Peppol BIS Order only
- Peppol BIS Ordering
- Peppol BIS Catalogue only
- Peppol BIS Despatch Advice
- Peppol BIS Punch Out
- Peppol BIS Order Agreement
- Peppol BIS Message Level Response
- Peppol BIS Invoice Response
- Peppol BIS Catalogue Without Response

6.5.2 *Additional document types*

Where the Peppol Network currently does not support some specific document types, these may be added at any point, subject to the OpenPeppol Change Management policy. Such new specifications can be developed and implemented by the TA with OpenPeppol.

6.5.3 *Supported response documents*

Having observed various CTC models around the world, there is a growing requirement of TAs to receive communication back from buyers to suppliers to close the transactional loop and ensure the highest level of the authenticity of the transaction. The Peppol Network currently offers the following options:



- Message Level Response (MLR) Peppol MLR is the mechanism that can be used by C4 to notify C1 (and, if required, C5) of a successful document receipt. This can be implemented either from day one or added later
- Invoice Message Response (IMR). Peppol IMR is the mechanism for use by C4 to provide a business response to C1 (and, if required, C5), eg, rejection or approval of the received document. This feature can be implemented either from day one or added at a later stage. For implementation of the IMR, it is important that the local PA/TA establishes the exact conditions and, especially, timeframe, during which an IMR must be sent or otherwise consider the effect of not sending IMR at all.

6.6 Scope of transactions

The Peppol CTC model has been designed in a way to support as many types of transactions as possible. The current architecture includes the following scenarios:

- domestic B2B traffic
- cross-border B2B traffic
- domestic B2C traffic
- non-Peppol traffic

How these different types of traffic are handled in Peppol CTC is outlined in a greater detail in section 7 Architecture. In this section, we provide a high-level overview of how these business requirements have been captured in Peppol CTC.

6.6.1 *Domestic B2B traffic*

OpenPeppol has a considerable experience and track record of enabling and processing transactional business documents in multiple jurisdictions.

From a Tax Subject perspective, there will be limited changes and deviations between the Peppol 4-corner and Peppol CTC 5-corner models, making implementation easier in jurisdictions where they may be operating or expanding their operations.

It is important to note that, for the purpose of this document, unless explicitly mentioned, we do not differentiate between B2B, B2G, G2B or G2G traffic and instead include all these variations under the 'B2B' term.

How the process will work from a Tax Subject perspective is outlined throughout this document in the various sections, assuming that this will be the major use case for implementation of Peppol CTC. The model has, however, been designed to handle other type of traffic and transactions. In this section we outline how handling of other type of traffic has been captured In Peppol CTC.

6.6.2 *SME support*

Peppol Network offers good possibilities for SMEs to automate their processes and comply with regulatory requirements. Looking at the experience of other countries with CTC schemes, there could be two complementing options offered to SMEs:

- free market choice of SP, based on the needs of the specific SME Tax Subjects, in combination with additional services offered by SPs
- SP provided by the government, free of charge or at a subsidised charge

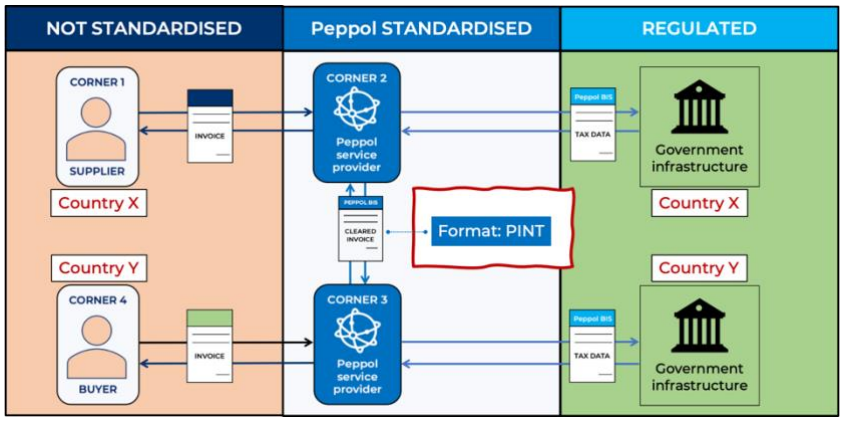
While SMEs are often exempted from CTC mandate, adoption of CTC by SMEs may offer a range of benefits, ie:

- single solution to reach all trading parties in the country versus using individual web portals provided and enforced upon SMEs by large buyer organisations
- decreased cost by removing the need for printing outbound invoices, scanning inbound invoices, or manually typing invoices in multiple systems
- technical complexity of compliance, clearance and validation, exchange and reporting are taken over by a third-party

6.6.3 *Cross-border B2B traffic*

In most jurisdictions, export and import (collectively, cross-border) transactions are, typically, initially exempted from CTC schemes. Where they are included, they often have a character of an additional reporting obligation, ie, the supplier reports the export invoice to a predefined government infrastructure and thereafter issues an invoice to the buyer abroad.

Peppol CTC offers a possibility to overcome this complexity, which becomes especially interesting if several countries implement the model. The main architecture elements are:



- C2 in country X performs document clearance and real-time reporting to the TA in country X, submitting TDD to C5 in country X
- C2 in country X sends in real-time the cleared BD to C3 in country Y
- C3 in country Y, upon receipt of the BD, creates TDD and sends it in real-time to C5 in country Y in accordance with the requirements set by TA in country Y
- C5 in country X and C5 in country Y each will have collected TDD, created from the same underlying BD between C1 in country X and C4 in country Y, so that they can match the data with each other during analysis processes

Use of Peppol BIS for TDD in multiple jurisdictions would simplify the data exchange between C5s between such jurisdictions.

6.6.4 B2C traffic

For B2C, it is necessary to differentiate between two BD types:

- B2C Invoices. A document issued by the seller to the buyer, to receive a payment for goods sold or services rendered
- B2C Receipts. A document issued by the seller to the buyer, as a confirmation of received payment for sold goods or rendered services

Looking at the different jurisdictions, there is limited to no harmonisation on real-time controls of B2C transactions on elements such as (i) frequency of reporting, (ii) content of the reported information, (iii) clearance requirements, or (iv) distribution to the end-recipient.

How and whether Peppol CTC could be applied to B2C transactions should therefore be studied based on the needs and pre-requisites in the specific jurisdiction. There are possibilities to utilise Peppol CTC for B2C transactions either using the 5-corner model or using only certain elements of the model. In the latter case, B2C traffic can be orchestrated as a 3-corner model, where the distribution of the document to C4 is done directly by C1 and not by C2; C2 will however perform clearance of BD and report TDD in real-time to C5. How exactly Peppol CTC could be leveraged for B2C transactions will be the subject of a separate document.

6.6.5 Non-Peppol traffic

Realising that utilisation of all existing Peppol Network components, which are recommended for Peppol CTC, may not be possible in certain scenarios, eg, SME, cross-border and B2C, the model has been designed in a way that supports other technical standards.

As an example, SPs should be able to send the BD in a format other than Peppol BIS to a receiver not registered in Peppol and similarly receive documents in a format other than Peppol BIS from sender not part of Peppol. This is beneficial for:

- domestic transactions, where one of the trading parties is not required to follow requirements to issue invoices electronically via the Peppol Network
- cross-border transactions to or from countries that have not yet implemented Peppol

Enabling these types of traffic and transactions, assumes that the jurisdiction has enabled the C3 validation and reporting feature. How this and other types of traffic are supported in Peppol CTC is outlined in greater detail in Section 7 Architecture.

6.7 Trust and controls

It is important for the TA to be able to trust SPs performing their obligations towards both Tax Subjects and the TA, according to the established highest standards and requirements. The Peppol Network has already in place the following documents:

- Legal Agreements
- Compliance Policy
- Trust and Security Policy
- Entity Identification (Know Your Customer) Policy.

This section outlines additional trust and control aspects for Peppol CTC.

Note that sections 6.7.1.-6.7.6. cover primarily trust and control elements for SPs, while for C5 and SMP this is covered in sections 6.7.7. and 6.7.8.

6.7.1 Service Provider CTC Certification

General certification requirements. Service Providers must pass OpenPeppol controls and requirements to operate as Peppol-certified Service Providers.

CTC certification requirements by TA. Given that SPs to certain extent will be acting on behalf of the TA or another governmental body, a TA might impose additional certification requirements on SPs to become CTC Certified, such as:

- be a legal person
- have proven sound and stable financial standing, eg:

  - not be included in a regime of restructuring or bankruptcy
  - not be subject to a tax debt collection procedure
  - not have suspended any payments under current financial obligations
  - have a capital or asset value equal to or greater than [x amount]
  - have professional insurance according to defined requirements
  - provide regular ongoing confirmation of financial standing
- provide information related to legal representatives, board members, partners, shareholders, and direct and indirect controllers, such as:
  - not have a legal representative with an unspent criminal conviction
  - not have a legal representative subject to a tax collection procedure
  - demonstrate competency of staff in place
- provide information related to beneficial owners of public companies
- maintain agreed information security certification, eg, ISAE, ISO/equivalent
- have a business continuity and contingency plan
- meet defined requirements towards C5, such as:
  - assurance of format and content compliance requirements for the BD
  - assurance of format and content compliance requirements for the TDD
  - uphold specified uptime SLA
  - uphold specified response SLA towards C1 and C4
  - uphold specified TDD reporting SLA towards C5
  - uphold specified BD exchange SLA between C2 and C3
  - uphold specified audit requirements towards TA
  - uphold security of communication
- at all times, offer technical support towards C1 and C4, eg:
  - Peppol BIS document formats
  - AS4 communication protocol
  - document legibility
- successfully complete a defined testing process

CTC Certification requirements to avoid. Although the certification requirements below are found in several countries, they may impose unfair or discriminatory restrictions and have a negative impact on trade or business operations in general, as well as deployment of Peppol CTC across multiple jurisdictions, in particular:

- be registered and/or established in the local jurisdiction
- with global and regional cross-border trade, where eInvoicing services are often provided by cloud-based vendors, such requirement would restrict the

Tax Subjects from selecting the vendor of their preference. While at the same time, there are other more effective mechanisms for the governments to oversee and control operations such vendors. Such requirement should thus not be imposed on SPs

- data residency in the local jurisdiction or in a specified private cloud (data sovereignty)
- Already today, data often does not reside within country borders, as many tax subjects use multiple software solutions to support their daily operations (eg, e-mail, ERP, workflow), which can either be in the open cloud or hosted in another country. Such requirement should thus not be imposed on SPs
- Where data residency is of concern, it can be resolved by placing requirements on the C5 and/or SMP, which will be operating as a single data vault where all data is gathered, bearing in mind that SPs in Peppol CTC only oversee a fraction of the data, compared to C5 or SMP

For an efficient rollout of the SP certification requirements across multiple jurisdictions, it is crucial that there is a dialogue and consensus between TAs regarding the final certification requirements criteria.

6.7.2 Service Provider monitoring and non-compliance

Monitoring. For any CTC model to function properly, it is crucial that the local PA or other governmental agency appointed by the TA performs continuous monitoring over the quality of the performance of the SPs. This includes monitoring of compliance both with the standard Peppol requirements, as well as those country specific for CTC. The Peppol framework provides for this.

Non-compliance. The Peppol Service Provider Agreement (section 18) includes a list of actions that the PA can take against a SP not meeting the defined requirements. These actions, depending on the severity of the non-compliance event, vary from warnings to revocation of the CTC Certification.

6.7.3 Structure of legal Agreements

To ensure proper contractual framework between the involved parties, Peppol framework foresees existence of three level of agreements:

- End-user Agreement: between SP and Tax Subjects. The parties are free to agree the scope of services that the Tax Subject will procure from the SP. Such agreements should fulfil certain minimum requirements established by Peppol Framework, eg, reference to Peppol Service Provider Agreement and that the SP can only act as a data processor on behalf of the Tax Subject from a personal data protection perspective
- Peppol Service Provider Agreement: between Peppol Authority (PA) and SP. This is a standard non-negotiable agreement that all SPs must sign with their PA and comply with as an SP within the Peppol framework

- Peppol Authority Agreement: between OpenPeppol and PA. This is a standard non-negotiable agreement that all PAs must sign with OpenPeppol and comply with as a PA within the Peppol framework

6.7.4 Clearance, validation and reporting processes

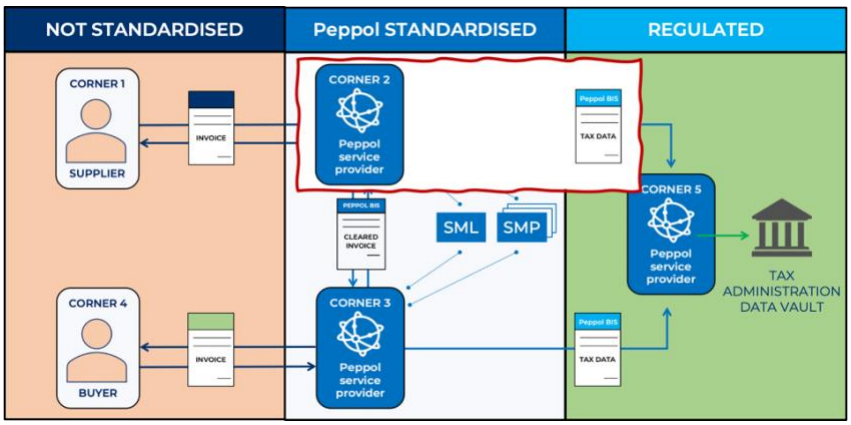
A core feature of any CTC model is the validation of the exchanged document for conformity with the existing legal and technical requirements. Getting data right from the beginning is one of the core pillars of Peppol Network and value-adds provided by the service providers

In Peppol CTC it will consist of two layers, based on:

- existing Peppol compliance validation requirements, which must comply with the minimum requirements on the indirect tax regulations in a jurisdiction
- additional country-specific compliance validation requirements, which may be established by the PA, in line with or beyond the minimum mandatory content requirements of indirect tax regulations

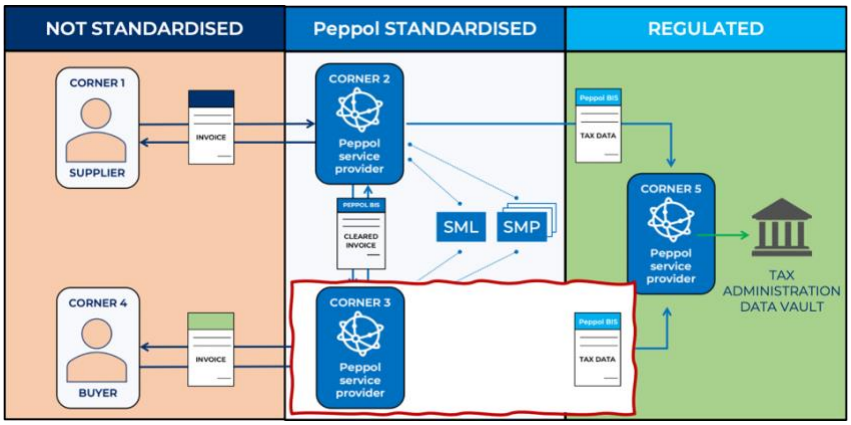
Standard Peppol validations. According to the standard Peppol Network rules, the issuer (C1) or the sending Service Provider (C2) is required to perform certain set of validations. Unless the document has successfully passed these validations, it may not be sent further to the receiving Service Provider (C3) and correspondingly the receiver (C4). This set of validations will always be performed, both in Peppol Network (4-corner model) and in Peppol CTC (5-corner model).

CTC validations and real-time reporting for issuance. The TA may implement additional validation requirements, beyond the standard Peppol validations, to be performed by SPs. Upon a successful completion of such additional validations, the issued BD will be considered as fiscally valid ('cleared') and ready for exchange between the trading parties. Document not cleared (rejected) by C2 may not be sent further to C3, nor any real-time reporting to C5.



When the TDD (DC in the issuance process) has been submitted by C2 to C5, the latter should respond with an acknowledgement (DCR) confirming that the TDD has been successfully received (see more detailed description under section 7.5.3). C1 will, upon successful validation, receive BD, DC and DCR from the C2.

CTC validations and real-time reporting for receipt. According to the standard Peppol rules, the receiving Service Provider (C3) is not required to perform any additional actions on the received BD. However, we propose that the TA in a CTC jurisdiction introduces an additional country-specific validation and reporting by C3, whereby C5 will in real-time receive a subset (Document Reported or DR) of the BD received by C3, on behalf of C4. Our understanding is that will be beneficial for the TA to know that the issued BD has been received for processing by C3/C4, so that real-time matching of sent and received data can be performed by C5. Other benefits of implementing C3 validation and reporting are outlined further in this section under "Independent reporting").



The scope of implementation of such validation and real-time reporting by C3 should, however, be carefully considered, as it may pose practical aspects and challenges in certain flows, such as import invoices, B2C transactions. It is therefore suggested that C3 validations are less strict compared to those performed by C2.

To clarify, in this step, C3 may not reject the received BD but should, in the DR submitted to C5, outline either conformity with or deviation from TA requirements, who can take action where data mismatch or warnings identified.

When DR has been submitted by C3 to C5, the latter responds with an acknowledgement (DRR) confirming that the DR has been successfully received.

Independent reporting. In the Peppol CTC we propose that each party (C1/C2 and C3/C4 respectively) submits TDD to C5/TA Independently of each other. This design is supported by several considerations, including:

- to limit the dependency of each Tax Subject that the other party has performed its tasks correctly
- to additionally ensure against the risk of a single point of failure
- in a domestic scenario, to enable submission of business document data to TA, where the sending party is not required to issue business documents electronically (as known, often small businesses are excluded from the eInvoicing obligation in CTC markets, at least initially)
- in a cross-border scenario, to enable submission of business document data by C2 to the TA of the C1 supplier and by C3 to the TA of the C4 buyer, and consequentially that both TA's can better reconcile the received data

- to improve TA data management, that might include prepopulating partial or full reports based on sales and purchase transaction data

6.7.5 TDD Integrity and Authenticity

To ensure integrity of the content and authenticity of the origin (I&A) of the TDD (both DC and DR), the PA may require CTC SPs to apply QES (Qualified Electronic Signature) with the service provider's certificate to each TDD submitted to C5 SP. A more detailed description of how this requirement has been implemented in Peppol CTC is provided under section 7 Architecture.

6.7.6 Unique identifier

As part of the clearance process, C2 and C3 should ensure existence of artefacts that would allow all parties (C5/TA, C1, C4) to uniquely identify, process, match, etc. each BD and TDD processed in relation of the specific transaction. More detailed description of how this requirement has been implemented in Peppol CTC is provided under Section 7 Architecture.

6.7.7 Legal certainty

From the Tax Subject perspective, an important requirement is to ensure legal certainty that that their obligations towards the TA have been correctly fulfilled. For this reason, the Peppol CTC model provides the following mechanism:

- for the supplier (C1), C2 shall provide to C1 the DC submitted to C5 and the DCR received from C5 for the same transaction to complement the issued BD. Where C1 has not generated BD according to the defined requirements and this has been done by C2, C2 shall provide the final BD
- for the buyer (C4), C3 shall provide to C4 the DR submitted to C5 and the DRR received from C5 for the same transaction to complement the received BD

6.7.8 Service Provider audit

The TA might want to perform certain audits on i.e. SPs conformity with Peppol CTC requirements established in the specific jurisdiction. More detailed description of how this requirement has been implemented in Peppol CTC is provided under Section 7.5.2 Auditing.

As the Tax Subject is always the owner of the fiscal data, any audit of such data must be directed towards the Tax Subject.

6.7.9 C5 acting on behalf of the TA

To have the Peppol CTC model as scalable as possible, the default approach is that C5 (receiving data on behalf of the local TA) follows the technical specification of Peppol, which includes among others support for Peppol BIS (exceptions can, however, be considered given country-specific circumstances). C5 should also support AS4 as a communication method with other SPs.

This approach will enable creation of data interoperability between C5s in various countries, so that the tax administrations will be able to exchange data more easily with each other and work on any potential cross-border matters more efficiently. Peppol CTC has, however, been designed in a way that other format(s) and data exchange protocols between C5 and other SPs can be supported.

C5 in Peppol CTC should be seen differently compared to other SPs, notably:

- C5 is primarily designated and designed to receive TDD from SPs
- C5 acts solely on behalf of the TA, while other SPs are contracted and may be switched by the individual end-users (Tax Subjects)
- C5 is the only instance in Peppol CTC model that will have access to all TDD exchanged between the Tax Subjects

As such, this Reference Document covers only minimum requirements for C5, given that the TA may want to impose different requirements on such a provider.

6.7.10 Service Metadata Provider (SMP)

Like C5, the SMP plays different roles in the Peppol 4-corner model and in Peppol CTC. We envisage that the TA may have different certification requirements towards the SMP vendor, potentially, implementing a single SMP for the whole jurisdiction, as opposed to utilising a distributed SMP approach.

6.8 Data protection, security, and sovereignty

A key consideration, when implementing a CTC model is data protection, security and sovereignty. This section outlines what has been taken into account when designing the Peppol CTC model.

6.8.1 Data minimisation

In Peppol CTC, the TA will determine the content of the TDD to be reported to C5, which is envisaged as a (indirect tax relevant) data subset of the full transactional document (BD). This approach will ensure that core principles of personal data protection and data confidentiality are met by data minimisation and use of data for clearly outlined legal purposes. Ensuring these requirements has become increasingly important in the era of new and stricter regulations concerning protection of personal and business information.

The vast majority of existing CTC models, particularly Clearance and Centralised Exchange, do not meet this requirement, as the full content of the BD is shared with the centralised government infrastructure.

An example where non-compliance with data minimisation principles has been intensively discussed is Italy. Among the observations noted by the Italian data

protection authority was the fact that Tax Subjects must submit SDI data[10] requirements that are not relevant for VAT controls, breaching the data minimisation requirements under the EU General Data Protection Regulations.

6.8.2 Sub-processor limitation

It is common for businesses for the purpose of issuing and sending and/or receiving and processing BDs to contract services of multiple third parties, such as printing providers, scanning providers, eInvoicing service providers, resulting in the data being scattered in multiple external systems.

As all CTC models, including Peppol CTC, presume that BDs will be issued, exchanged, and processed electronically, this limits the number of sub-contractors that Tax Subjects will engage to process data. In this regard, a CTC obligation helps businesses to improve data security and protection.

6.8.3 Data security

The Peppol Trust and Security Policy is the document that defines the minimum level requirements for all actors within the Peppol Network, covering the.:

- Transport Layer Security (TLS) certificates
- Peppol Service Domain certificates, issued from the Peppol PKI

Since February 2020, all Peppol service providers are required to use the AS4 communication protocol[11] for the exchange of messages within the Network. Other security elements may in future be developed and added within Peppol Network, such as end-to-end encryption.

6.8.4 Data sovereignty

Some jurisdictions may express the need or requirement of data sovereignty, for example, that data must be stored or processed within country borders.

Peppol CTC has three distinct elements from this perspective:

- Service Providers at C2/C3. We recommend that data sovereignty should not be strictly applied to these SPs, given that they often operate in multiple jurisdictions, supporting Tax Subject operations in several Peppol 4-corner and, potentially, several Peppol 5-corner jurisdictions. Where data sovereignty is considered, it should reasonably be allowed for SPs to process and store data in other jurisdictions considered safe by the specific country, based on specified criteria, eg, mutual tax assistance agreements, personal data protection adequacy assessment.

[10] https://www.fatturapa.gov.it/export/fatturazione/en/index.htm

[11] https://docs.peppol.eu/edelivery/as4/specification/

- an exception from this, ie, stricter requirements applied, may be applied where the government decides to provide its own SP, eg, for the use by government sector and/or SMEs only, based on the existing infrastructure. See section 6.10.4 below.
- Service Provider at C5. Only C5 will have access to all data (TDD) issued and received by all Tax Subjects in a jurisdiction, as C2/C3 SPs will only process data for the individually contracted Tax Subjects. It Is, therefore, not unreasonable to expect that the TA would have more strict data sovereignty requirements for C5. Peppol CTC foresees such possibility.
- SMP. Depending on the choice of SMP model (decentralised or centralised), different levels of data sovereignty requirements may be applied. For the decentralised model, we recommend that the same approach is taken as for SPs. Alternatively, the centralised SMP model offers greater possibility to have stricter data sovereignty approach. With the centralised approach, the TA could be the entity in charge of the SMP, including hosting the registry within the country borders.

6.9 Efficiency considerations

One of the key requirements of a CTC model is to ensure balance between the control requirements of the TA and businesses efficiency, including limiting the impact of the controls on everyday operations. This section outlines how such balance and efficiency requirements have been ensured in Peppol CTC.

6.9.1 User experience

Peppol CTC provides for a framework that can be easily replicated and deployed in multiple jurisdictions. Besides the need for localisation of document content and format, there is an imperative to provide tax subjects with the necessary user experience and support, to ensure compliance with local requirements.

Language support. Tax subjects can select an SP of their choice to fulfil obligations. It is the responsibility of the SP to ensure that that their solution provides the necessary language support to a Tax Subject. An advantage of Peppol CTC is that there will be SPs able to operate in multiple languages, not limiting the user experience to a single language. This is not the case for existing CTC models, where only the local language is provided both in the user interface of the government infrastructure and in the documents exchanged in the jurisdiction, making it challenge especially for international businesses to comply with local requirements. Peppol BIS supports multiple language codes, to fulfil local language requirements for issuance of valid tax invoices.

Technical support. To ensure local compliance, it is important to recognise the need for international businesses and service providers to receive support in languages other than the local language. This includes both contact with the governmental support organisation and obtaining the necessary technical specifications for integration. With the decentralised approach, tax subjects will be able to receive technical support and technical specifications in other languages,

by their selected SP, which will simplify their cost to become and remain compliant in the specific jurisdiction. While there will be a need for the government to provide support to SPs, such effort will be significantly lower compared to other CTC models, as both the existing Peppol governance, infrastructure and technical specifications are already in place and the main contact points will be limited to SPs excluding the direct contact with Tax Subjects.

6.9.2 Accounts Receivable (AR) and Accounts Payable (AP) automation

All CTC models are designed and implemented to meet the requirements of the TA in a respective country. However, the requirements of businesses are only considered to limited extent. As the result of such models, it has become complex for the businesses to automate their AR and AP processes efficiently.

The two main issues are format and exchange of BD:

- BD format is decided and controlled by the TA. While this fulfils the indirect tax requirements, the business needs of the tax subjects are only met to some extent. Tax subjects then need to implement additional or parallel processes in order to circumvent this shortcoming. To illustrate:
- in Mexico a concept of Addenda has been introduced. As the CFDI XML is rather slim from business content perspective, the large purchasing organisations demanded from their suppliers a CFDI attachment with additional business content. There are over a hundred different Addenda in Mexico, typically buyer specific and issued in varying invoice formats
- in Colombia businesses can add additional information in the Colombian version of UBL 2.1 in two fields. Which results in such fields becoming lengthy, unstructured, and complex for processing
- in Argentina businesses, despite exchanging XML with AFIP (the Federal Administration of Public Revenues), are still printing, and sending paper invoices between each other
- in Italy where direct exchange of the fiscally valid eInvoice between the seller and the buyer is not allowed (except of certain circumstances), the businesses start exchanging electronically commercial invoices bypassing SDI, where the businesses can exchange more information than what is provided for in the mandated FatturaPA format
- BD exchange. Efficient electronic document exchange does not exist in the Clearance models used in Latin American countries, where eMail is the primary tool used by businesses. Studies suggest that 90% of eInvoices in Latin America are exchanged by eMail, which is inefficient and unsecure.

In Peppol CTC these concerns are resolved, as on one hand the underlying BD format Peppol BIS is based on the rich UBL format, it is adapted for business needs and, even more importantly, is continuously revised, improved and extended to capture more business requirements. While Peppol BIS is foreseen to be mandatory in Peppol CTC (between C2 and C3), the content thereof is not strictly

regulated by the TA. What is strictly regulated is the content of the TDD reported to C5, which is derived from the BD exchanged between the businesses.

Peppol Service Providers already support businesses with their document compliance requirements, as well as helping businesses to automate their AR and AP processes. Among broadly offered features, one can find:

- validation of the content of the document
- enrichment of the content of the document
- conversion of the content of the document
- conversion of the format of the document

The above features allow businesses to maintain compliance with local regulatory requirements, such as direct tax, and with trading party or industry specific requirements, which helps businesses to streamline processes and operations.

On the other hand, thanks to the existence of the SMP, which contains information about a Tax Subject's e-capabilities as well as their unique Peppol ID, the identification and exchange of documents in a structured format in real-time is resolved efficiently. There is no exchange of documents on paper or by eMail in Peppol Network, which means that the correct end users receive data faster, more efficiently and more securely.

6.9.3 Service level arrangements

Based on the analysis and practical operations in various CTC markets, especially with Clearance and Centralised Exchange models, one can conclude that implementation and maintenance of the service level arrangements (SLA) towards the tax subjects is an 'Achilles' heel' for many governments. Often, the existing platforms do not commit to uptime, response or support SLA. In other cases, the committed response SLA might be as long as 5 days, eg, in Italy.

Peppol CTC offers resolution to this issue, as there exist SLA requirements that SPs must adhere to, to become and maintain certification. Further, service providers usually will provide either additional SLA than those required under Peppol Network or exceed the required levels for competition reasons:

- Uptime, response, exchange SLAs. Peppol Service Level Agreements sets minimum mandatory SLAs that must be provided and upheld by organisations to become and remain certified as Peppol Service Providers
- Support services. The Service Provider Agreement lists mandatory support services that a Peppol Service Provider must provide to End Users

6.9.4 Service provider switching

Greater standardisation, as with the Peppol Network and Peppol CTC, provides the tax subjects with the ability to more easily change their service provider.

Service providers offering CTC services also offer a range of other value-added services. Businesses will therefore be able to change their service provider based on the quality of CTC services offered; quality or range of value-added services (eg, accounting, financing, AR/AP automation; coverage of O2C/P2P services); and service level arrangements, e.g. satisfaction or scope of their services.

6.9.5 Contingency mode

There is no technical contingency mode foreseen in the Peppol Network per se. However, looking at the examples of some CTC jurisdictions, a framework can be implemented, where the issuer should:

- be able to issue the document outside Peppol CTC
- mark on the document the reason for issue outside of CTC, eg, disruption of Tax Subject, C2/C3 or C5
- be required to issue the same BD electronically, once the reason for the contingency has been resolved or report such BD in a different way to C5 without re-issuing the document in the Peppol CTC.

It is, however, worth noting that from technological perspective Peppol CTC foresees certain mechanisms that mitigate such circumstances:

- the data exchange between C2/C3 and C5/TA is asynchronous, meaning that the exchange of the BD between the trading parties is not dependent of C5 availability or uptime
- C1/2 and C3/4 submit data to C5/TA independently of the other party.

6.9.6 TA interoperability

Would several jurisdictions opt-in for Peppol CTC, it would provide them with an unprecedented level of data interoperability on intra-state level. Where they could easier exchange data, which will be based on the same technical format and have similar content, simplifying the analysis processes.

6.10 Incremental deployment

A big-bang implementation might be challenging and costly both from a TA and Tax Subject perspective. Peppol CTC offers flexibility which is outlined below.

6.10.1 Speed of deployment

As Peppol CTC builds largely on Peppol Network existing technical components and governance model, the model is much quicker and easier in deployment, compared to creating a brand-new infrastructure.

6.10.2 Necessary localisations

While Peppol CTC provides a standardised approach, the model offers the TA with necessary mechanisms and features to ensure various localisation aspects, such as:

- country-specific BD and TDD content requirements, ie, invoices, rectification documents, orders, despatch advises, etc, or
- country-specific self-billing process, where the buyer issues BD e.g. invoices to the supplier, upon earlier agreement, or
- country-specific rectification process, eg, credit/debit note, cancellation

6.10.3 Modular deployment

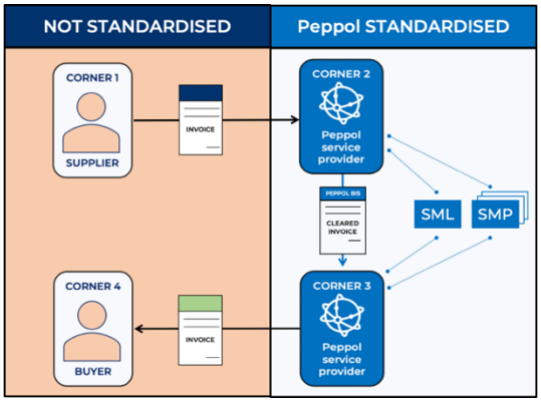
Peppol CTC consists of multiple modules, which do not necessarily have to be deployed in the specific jurisdiction at the same time; on the contrary, deployment may be gradual depending on the needs and maturity of the market and/or of the government platform. Gradual deployment of the elements listed below can be undertaken without major technical implications for the network or the end-users, in comparison with existing CTC models, meaning that not everything has to be deployed at the same time.

- BD types (varying documents exchanged between Tax Subjects) can be subject to Peppol CTC, including invoice, order, catalogue, despatch advice, utility statement etc. Where Peppol currently does not support a document type, this may be added, subject to Change Management procedures. New specifications can be developed and implemented by a Peppol Authority working together with OpenPeppol
- Response messages, meaning messages sent by the buyer (C4) back to the seller (C1) and/or C5, such as invoice approval or rejection. Specifics are outlined above under Section 6.5.3.
- QES, whether QES should be applied to TDD sent to C5 or not
- Type of traffic, meaning profile of the traffic included In the CTC schema B2B, B2G, B2C, domestic, cross-border, etc. Specifics are outlined above under Section 6.6.
- Governmental SP, meaning that TA may deploy its own SP, which they provide for use by certain types of businesses or industries.

6.10.4 Leveraging existing investments

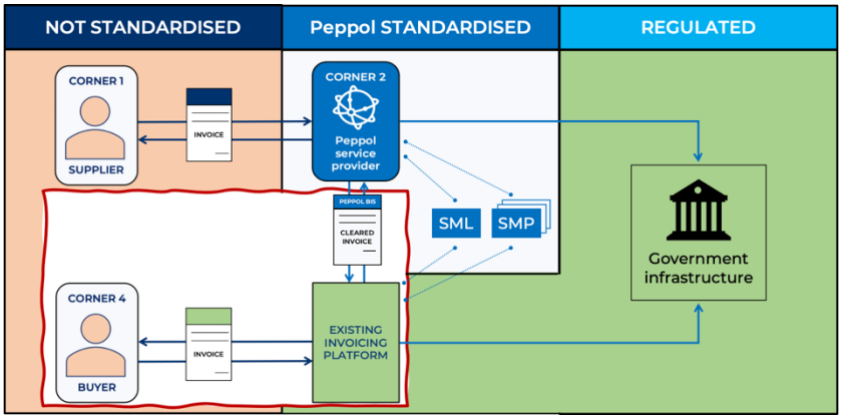
Where a country has already selected and/or implemented a certain CTC approach, under certain circumstances the Peppol CTC model can still be deployed in that jurisdiction with limited adoption cost, as opposed to implementation from scratch or changing of the model completely.

Existing Peppol framework. Many countries have implemented the Peppol Interoperability Framework, based on the 4-corner model. Peppol CTC can be added to their existing Peppol implementation.



In this option, the principles, and technical aspects of operations between C1 and C2 on the one hand, and between C4 and C3 on the other hand, remain unchanged. The main changes will impact on the technical and operational aspects between C2 and C3 service providers, who need have to become CTC certified, respectively with C5, which would have to be established.

Existing invoicing infrastructure as a Service Provider. Some countries have deployed eInvoicing infrastructures for the exchange of invoices and other documents between contracting authorities and their suppliers, eg, under the public procurement framework, the so called B2G e-invoicing. These platforms often offer a web portal for use by SMEs. In some countries, they have as well ensured the ability to receive and process eInvoices via Peppol.



Such platforms can become one of the SPs operating in the country, and designated contracting authorities, that already have an integration in place, or for SMEs which could be offered a possibility to free-of-charge send and receive invoices with other trading parties via a web portal. This will decrease the investment needed to deploy a CTC model. While other larger businesses will have the opportunity to select any other SP of their choosing.

Existing infrastructure as C5. Some countries may have already deployed a CTC scheme or at least put a central infrastructure in place. Peppol CTC could as well be deployed in such jurisdictions, under certain considerations, as outlined under Section 5.3 above.

7 Architecture

7.1 Overview

This section describes the architecture of Peppol CTC based on the business requirements described in the previous section. In addition, the architecture takes the following areas into consideration:

- Separation of concern
  - Peppol CTC exists separate from other Peppol Network traffic to support TDD reporting even, if applicable, for non-Peppol BD delivery
  - clear separation and distinction between the different areas that define Peppol CTC to more easily modify or enhance parts of the architecture:
    - document content and validation
    - delivery
    - trust
    - document delivery process
- Using standardised components, where applicable, for an architecture to:
  - support wide adoption
  - increase maintainability and lowers costs
  - secure performance and scalability
  - create a large community with knowledge and commitment

7.2 Document content and validation

7.2.1 Document syntax

Peppol CTC proposes the use of a standard TDD format syntax, that MUST be equal to or a subset of the BD, in all different jurisdictions to:

- increase adoption and support from CTC SPs
- enable TDD interoperability between TAs in different jurisdictions

Since Peppol CTC supports BD delivery outside the Peppol Network, the TDD validation rules will exist as a separate ruleset from the BD validation rules, but be a mandatory validation step when delivering BD within a Peppol CTC jurisdiction.

7.2.2 Validation Rules

To separate the validation rules for the TDD depending on whether the BD is being sent by C2 or received by C3, the TDD has two separate document types:

- Document Cleared (DC) when sent to C5 from C2
- Document Reported (DR) when sent to C5 from C3

The validation rules (issue validation) for DC should support the existence of rules for both fatal and warning level, that MUST result in the BD being stopped from delivery when one or more fatal rules has failed. The validation rules (receipt validation) for DR MUST never prevent the BD from being delivered to C4 and can only contain rules with a warning level.

The validation rules for all TDD messages are created and maintained by C5/TA.

7.2.3 C5 Response Messages

Peppol CTC supports two response messages, providing proof of TDD delivery:

- Document Cleared Response (DCR) - The message sent from C5 to C2 as a response to a DC
- Document Reported Response (DRR) - The message sent from C5 to C3 as a response to a DR

The DCR and the DRR serve as a legal proof for the Tax Subjects (C1 and C4 respectively) that their TDD submission responsibility towards C5/TA has been fulfilled. For more details see Section 7.6.3.

7.2.4 Document Type Identifier and Process Identifier

DC and DR will each have a new Process Identifier. This new Process Identifier reflects the fact that it is simple transaction reporting without any other document types besides Invoice. DC and DR will have different Document Type Identifiers.

7.2.5 Document Content

In addition to the content requirements stated by the TAs in relation to the BD, the following content should be supported in the DC and DR:

- rules failing with warning level
- signature of C2 and C3

7.3 Jurisdiction

7.3.1 C5 jurisdiction

It is the Tax Subject (C1 and C4) that is responsible to inform their respective Service Provider (C2 and C3), who submit the Tax Data Document to C5. As a main rule, C2 sends TDD to C5 where C1 is registered, while C3 sends TDD to C5 where C4 is registered. BD content jurisdiction is irrelevant for C5 reporting, ie, BD content jurisdiction and C5 reporting jurisdiction may vary (eg, in cross-border scenario).

7.3.2 *BD content jurisdiction*

The issuing Tax Subject (C1) is responsible for correct determination of the correct BD jurisdiction and its content requirements. C1 must indicate the applicable jurisdiction rules in the BD sent to C2, so that C2 can apply correct validation rules.

Typically, BD content jurisdiction and C5 reporting jurisdiction are the same, so that C2 performs validations intended for creation of DC. Where the BD content jurisdiction differs from the C5 reporting jurisdictions, C2 performs validations intended for creation of DR.

7.4 Delivery

7.4.1 *Components*

Peppol CTC recommends using the existing delivery components utilised within the Peppol Network, including the AS4 communication protocol, to:

- prevent non-standard and unscalable transport protocols and syntaxes
- increase national and cross-border interoperability for TAs
- support the adoption of Peppol CTC in countries that have not yet adopted the Peppol Network

7.4.2 *Dynamic Discovery*

Even though the number of C5/TAs might initially be limited and might not require the use of the dynamic discovery with SML and SMP technology, it comes with several advantages that makes it a powerful tool within Peppol CTC:

- supports version handling of DC and DR
- supports different syntaxes and validation rules of DC and DR
- keeps *endpoint/URL* of C5
- critical when migrating to another *endpoint/URL*
- keeps transportProfile
- useful when migrating to a new transport technology or version
- may support transport profiles used within a jurisdiction
- prepare and enable adoption of SMP for non-Peppol markets

Since the SMP API requires the knowledge of recipients before doing a lookup, each SP needs to support the process of identifying the C5/TA that is the recipient within a specific jurisdiction, as well as storing the *endpointId* used in the SMP lookup.

Responsibilities of SMP registration:

- C5/TA MUST register capability for receiving DC and DR in SMP
- C1 MUST register capability of receiving DCR in SMP
- C4 MUST register capability of receiving DRR in SMP
- C2 MUST make sure that C1 is registered for receiving DCR in SMP before sending DC to C5/TA
- C2 MUST keep track of C5/TAs participant id in SMP
- C3 MUST make sure that C4 is registered for receiving DRR in SMP before sending DR to C5/TA
- C3 MUST keep track of C5/TAs participant id in SMP

7.5 Trust

Since Peppol CTC proposes a Decentralised Clearance model, it is imperative that the framework provides sufficient trust and control elements for the TA to trust the SPs. As described in Section 6 Business Requirements, trust is established through three control elements:

- Service Provider CTC certification
- auditing
- reliable document delivery process

7.5.1 Service Provider CTC Certification

To provide increased trust and control mechanisms to the TA, the Peppol CTC framework gives each TA the possibility to become a certification body within their jurisdiction. For more details, please refer to Section 6.7.1.

Certification support is facilitated among others through optional use of digital signatures that are applied to the TDD, making it possible for the TA to reject the TDD, if a non-certified SP is the sender. The digital signature should be done with a Peppol CTC certificate issued by the OpenPeppol Operating Office once for all jurisdictions but should be specifically allowed within a jurisdiction by the TA.

7.5.2 Auditing

The TA must be able to uniquely connect a specific BD to a TDD that has been reported by an SP. To prevent any impact from Peppol CTC on the normal BD delivery in the Peppol Network, no new identifier will be introduced to the Peppol BIS or Peppol Envelope syntax. Instead, the unique identifier must be derived by combining the following properties:

- Supplier Endpoint Identifier (SEI)
- Customer Endpoint Identifier (CEI)

- Document Identifier (eg, invoice number) (DI)
- Fiscal year (FY)

In addition, the unique identifier must be structured in the following sequence with '/' (slash) as the property separator:

- SEI/CEI/DI/FY

This identifier can be used in the following scenarios:

- during audit of C1 or C4 when matching the BD with the TDD
- enforcing increased control mechanisms by connecting a DC or DR received from a TA within a different jurisdiction

Auditing of cleared BDs should never be executed on SPs directly but through C1 or C4 based on their agreement/services with their SP. SPs should only be directly audited regarding the CTC processes, where the checks could include:

- identification of CTC jurisdiction
- creation of TDD (extraction of data based on business document)
- verification/validation of TDD
- application of TDD signature

7.5.3 Reliable Document Delivery Process

Another trust element concerns the document delivery process and the following steps are introduced in the document delivery process to enforce trust:

- TDD is created by extracting the information from the BD by C2 or C3
- C2 or C3 ensures that the TDD is valid according to the TDD requirements within that jurisdiction
- the C2 makes both the DC and DCR available for C1
- the C3 makes both the DR and DRR available for C4

7.6 Document exchange process

This section gives a more detailed view of the document delivery process in Peppol CTC, describing how to apply the different trust components needed in a decentralised clearance model. The document delivery process is separated into:

- document issuance process
- document receipt process

Both processes describe the concepts of who executes a particular operation and who is legally responsible for ensuring that the operation is executed correctly.

7.6.1 Document issue process

This section describes the process of sending a document when C1 is within a Peppol CTC jurisdiction. Document issue occurs in the following scenarios:

- B2B/B2G BD distributed in or outside the Peppol Network, inc cross-border
- B2C BD distributed in or outside the Peppol Network

Note that even when the BD is distributed outside of the Peppol Network, the TDD is always distributed to C5.

Action	Executor	Responsible
Generate, get or extract document content	C1/C2	C1
Convert, enrich, and validate content to fulfil BD requirements	C1/C2	C1
Fetch capabilities of C4. If BD is distributed within the Peppol Network, it will be a look up to a SMP	C1/C2	C1
Create Business Document (BD)	C1/C2	C1
Validate BD per specification requirements If C2 is the executor, then: - if unsuccessful, send Rejection reason to C1 - if successful, proceed further	C1/C2	C1
Validate BD per additional PA issuance requirements If C2 is the executor, then: - if unsuccessful, send Rejection reason to C1 - if successful, proceed further	C1/C2	C1
Responsibility of BD moves on to C2	C1/C2	C1
Ensure BD validity per specification requirements - if unsuccessful, send Rejection reason to C1 - if successful, proceed further	C2	C2
Ensure BD validity per additional PA issuance requirements - if unsuccessful, send Rejection reason to C1 - if successful, proceed further	C2	C2
Identify if C5 exists for C1 jurisdiction - If no, skip Peppol 4-corner and/or Peppol CTC - If yes, pass to Peppol CTC	C2	C2
Check C5 inbound requirements in SMP	C2	C2
Create DocumentCleared (DC) from BD	C2	C2
Initiate transmission[12] of DC to C5 Transmission result is a DocumentCleared Receipt (DCR)	C2	C2
Initiate transmission of BD to C3	C2	C2
Make BD, DC and DCR available for C1	C2	C2

[12] Submission to C5 is asynchronous. If the initial submission is unsuccessful, C2 will continue trying to reach C5 until successful submission. This allows to further limit dependencies between the components and actors in the model.

7.6.2 Document Receipt Process

This section describes the process of receiving a document when C4 is within a Peppol CTC jurisdiction. The document issuance could be within the following business scenario:

- B2B/B2G BD received within or outside the Peppol Network, incl. cross-border
- Optionally, B2C BD received within or outside the Peppol Network

Note that even when the BD is received outside of the Peppol Network, the TDD is always distributed within the Peppol Network.

Action	Executor	Responsible
Receive BD	C3	C3
Identify C5[13] for C4 jurisdiction - If no, skip Peppol CTC - If yes, pass to Peppol CTC	C3/C4	C3
Check C5' inbound requirements in SMP	C3/C4	C3
Ensure BD validity per Additional PA Reception Requirements	C3/C4	C3
Create DocumentReported (DR)	C3/C4	C3
Initiate transmission[14] DR to C5' The result of the transmission is a Document Reported Receipt (DRR)	C3	C3
Responsibility moves to C4	C3	C3
Receive and process BD	C4	C4
Make DR and DRR available for C4	C3	C3

7.6.3 Handling of response messages

This section describes the different response messages in Peppol CTC to provide a clear distinction on how they should be used. Some responses are important artefacts belonging to a business transaction, some from a legal perspective, while other responses are technical responses used for signalling that an error occurred.

Legal responses from C5/TA (DCR/DRR). DCR and DRR are response messages as part of the business transaction and are legal documents serving as proof of successful reporting of TDD to C5/TA. DCR/DRR could contain information about

[13] "C5'" instead of "C5" is used here to support cross-border traffic, where C1 and C4 might be in different jurisdictions.

[14] Submission to C5 is asynchronous. If the initial submission is unsuccessful, C2 will continue trying to reach C5 until successful submission. This allows to further limit dependencies between the components and actors in the model.

the outcome of the signature validation performed by C5, which does not prevent the exchange of the BD.

A failed signature validation is a signal back to C1/C4 and C5 to take the appropriate measures to resolve the irregularity and for TA to take actions towards C2/C3.

Technical responses from C5/TA. In Peppol CTC, there are two different technical response messages:

- Transport Level Response (TLR)
- Message Level Response (MLR)

TLR only states the outcome of a message transmission on the transport level. In the AS4 protocol this is a AS4 Signal Message. Examples or TLR status could be:

- successful transmission of messages
- unsuccessful transmission of message caused by incorrect packaging
- unsuccessful transmission of message caused by invalid certificate
- unsuccessful transmission of message caused by unsupported signature method

MLR, on the other hand, is responding to the processing that occurred after a message was successfully transmitted. Examples of MLR status could be:

- successful processing
- unsuccessful processing
    - caused by TDD becoming corrupt or invalid during the transmission process from C2/3 to C5 (eg, incorrect signature, encryption, enveloping, encoding)
        - in such scenario C2/3 should resubmit TDD according to the relevant transport profile policy
    - caused by C2/3 not applying the relevant validation rules (eg, outdated, incorrect jurisdiction, not applying at all)
        - in such scenario C1/4 should cancel the BD and issue a new one, with C2/3 applying the correct validation rules
    - caused by submission to incorrect C5:
        - in such scenario C2/3 should resubmit TDD to the relevant C5

The MLR enables automated handling of errors, that would normally involve human communication through email, phone, etc.

Rejection notifications from C2 to C1. C2 performs validation of the submitted data against applicable validation rules. If the submitted data does not pass the validation requirements, C2 CTC SP shall return a rejection notification to C1

informing it clearly of the identified irregularities, so that C1 can rectify the reason(s) for rejection.

C2 CTC SP may as well return notifications informing C1 of impossibility to deliver the BD to C3 CTC SP, eg, due to incorrect addressing information.

7.7 End-to-End encryption

End-to-end encryption is a topic that has been an important aspect of all Peppol architecture in the past but has also recently been explicitly requested by several PAs with OpenPeppol. To meet this possible requirement, end-to-end encryption has been an important factor in the Peppol CTC architectural design. However, the current document delivery process does not explicitly mention it, to provide a simple and understandable process.

End-to-end encryption has an impact on some of the trust elements within the reliable document delivery process.

8 Proof of Concept (PoC) implementation

This section describes the Peppol CTC PoC, based on the business requirements and architecture described in the previous sections.

The PoC consists of two steps:

- implementation of Peppol CTC artefacts and processes used in C2, C3, C5
- involvement of external Service Providers and Tax Administrations to verify and test relevant processes in the PoC test environment

8.1 Step 1 - CTC artefacts and processes

8.1.1 Tax Data Documents (TDD)

The PoC will implement the first version of the Peppol CTC artefacts related to Tax Data:

- Document Cleared (DC)
- Document Cleared Response (DCR)
- Document Reported (DR)
- Document Reported Response (DRR)

All artefacts will be based on the common components of UBL but will be new message types not existing in the UBL package today.

In addition, new validation artefacts will be implemented for all the TDD messages. The validation rules for the DC, DCR and DRR messages may contain fatal rules, whereas DR messages will not contain any rules above warning level.

The digital business level signature applied to DC and DR will be applied using the *xmldsig* process and syntax (https://www.w3.org/TR/xmldsig-core/). The signature will be applied and processed in the process implemented in C2, C3 and C5 when handling TDD. The technical details of the signature creation are described later in this document.

8.1.2 CTC process

In addition to the TDD, the PoC will also include implementation of C2, C3 and C5. Implementation will focus on the Peppol CTC processes but will also support sending 'regular' business document from C2 and C3 via the Peppol Network.

To support other Service Providers and Tax Administrations joining the Peppol CTC Test Network (CTN) later in step 2 of the PoC, all corners (C2, C3, C5) will be deployed as services at a public cloud provider, communicating with the standard Peppol components like SMP and AS4. This will make it possible for Service Providers and Tax Administrations to bring in their Peppol CTC implementations for testing against other implementations.

Since all Peppol CTC artefacts are under development and not yet official business messages in Peppol, all use of SMP lookup must use the SMK only.

Implementing base process in C2. This consists of the following major parts:

- receive Peppol BIS UBL Invoice/UBL Credit Note
- check C5 requirements in SMP (via SMK)
- creation of DC from Business Document
- validation of DC. Failed validation will stop the delivery of BD and DC
- initiate transmission of DC to C5
- initiate transmission of BIS Invoice to C3, independently of the sending result to C5
- make the result of sending BIS Invoice process (AS4 *signalmessage*) available to C1
- make DC and DCR available to C1

The delivery and process of Peppol BIS Invoice is not exhaustive and complete since the focus is on the Peppol CTC process.

Note that the identification of C5 jurisdiction for C1 is not handled in the PoC.

Implementing base process in C3. This consists of the following major parts:

- receive Peppol BIS UBL Invoice/UBL Credit Note
- check C5 requirements in SMP (via SMK)
- creation of DR from BD
- validation of DR. This validation should never stop the process.
- initiate transmission of DR to C5.
- make BIS Invoice available to C4
- make DR and DRR available to C4

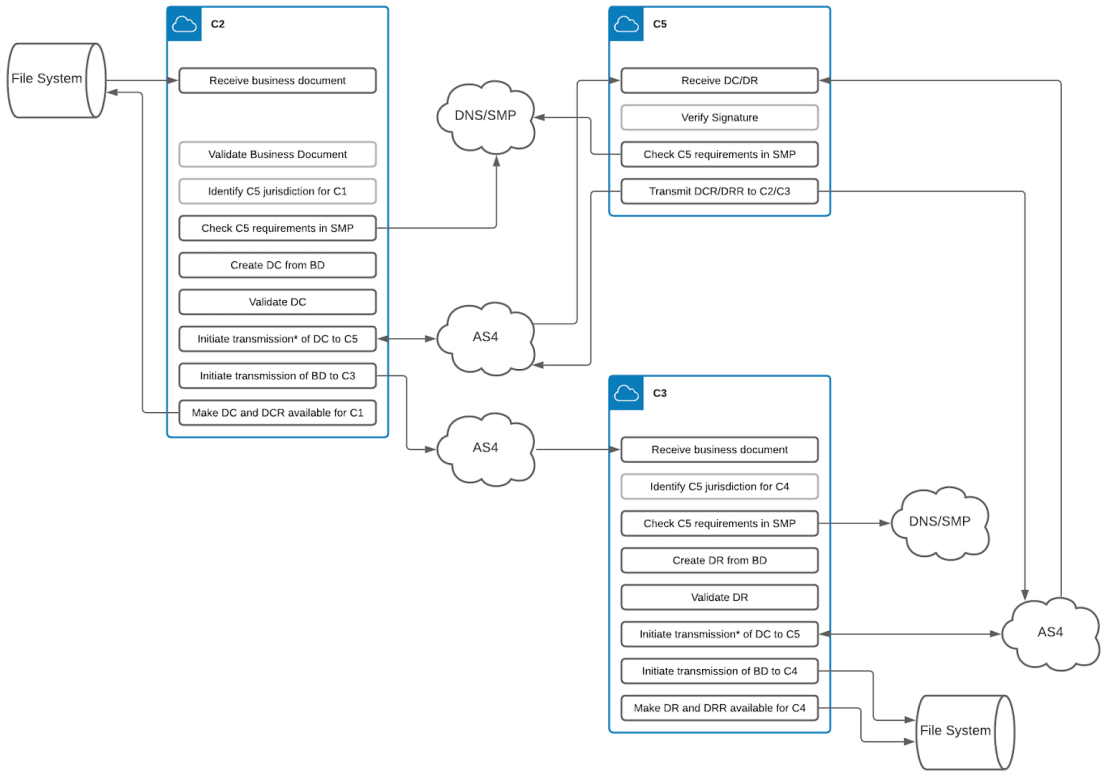
The delivery and process of Peppol BIS Invoice is not exhaustive and complete since the focus is on the Peppol CTC process.

Note that the identification of C5 jurisdiction for C4 is not handled in the PoC.

Implementing base process in C5. This consists of the following major parts:

- receive TDD (DC/DR)
- check C2/C3 requirements and endpoint address from SMP, determined from SBDH or TDD
- transmit TDD Response to C2/C3 (DCR/DRR)

The C5 PoC implementation will not perform any signature verification, but simply produce a TDD Response based on the received TDD and send it back to the Access Point that sent the TDD.



8.2 Step 2 – Participation of Service Providers and Tax Administrations

With Step 1 of the PoC complete, the PoC is ready for Service Providers (SPs) and Tax Administrations (TAs) to bring in their implementation and platforms to Peppol CTN. By registering and using the SMK/SMP lookup they will be able to send Tax Data (and Business Documents) to one of the PoC corners or other Service Providers/Tax Administrations participating in Step 2 of the PoC.

- an SP providing a CTN C2 Node must:
  - send Peppol BIS Document to CTN C3
  - receive AS4 signalmessage from CTN C3
  - send Document Cleared to CTN C5
  - receive Document Cleared Response from CTN C5
  - have an SMP entry for Document Cleared Response
  - ensure validity of outgoing documents
- an SP providing a CTN C3 Node must:
  - receive Peppol BIS Document from CTN C2
  - send AS4 signalmessage to CTN C2

- send Document Reported to CTN C5
- receive Document Reported Response from CTN C5
- have an SMP entry for Document Reported Response
- have an SMP entry for Peppol BIS UBL Invoice
- have an SMP entry for Peppol BIS UBL Credit Note
- ensure validity of outgoing documents

- a TA providing a CTN C5 Node must:
  - receive Document Cleared from CTN C2 Node
  - send Document Cleared Response to CTN C2 Node
  - receive Document Reported from CTN C3 Node
  - send Document Reported Response to CTN C3 Node
  - have an SMP entry for Document Cleared
  - have an SMP entry for Document Reported
  - ensure validity documents

The PoC created in Step 1 is not a Test Bed and will not be a guarantee that the implementation and process implemented by Service Providers and Tax Administrations are correct. It should be seen as a way of testing how the Peppol CTC process will be aligned with the existing implementation of business document delivery and clearance processes. It also provides an opportunity to involve more experts in the project and obtaining their feedback.

9 Policy and deployment considerations

This section includes a high-level overview of actions that must be taken or otherwise considered, when analysing, selecting, and deploying a CTC model.

9.1 Regulatory frameworks

CTC regulatory framework and localisations. This captures a broad group of regulations ranging from making necessary amendments to existing regulations, to drafting and implementing new regulatory and technical frameworks. Considerations include, but are not limited to:

legal establishment of the precise CTC model; documents to be captured under the scheme

- document and content formats to be used by tax subjects and service providers between each other and the governmental infrastructure
- document retention requirements
- exclusion of any tax subjects from the obligation timelines
- comprehensive technical specifications
- division of responsibilities between the parties involved
- service provider certification
- monitoring and change management frameworks

Derogation/right to sign international agreements. Some jurisdictions might have restrictions on the freedom of the right for governmental agencies to conclude international agreements or freely adopt certain regulations. It is important to determine whether this is the case to initiate the process of approval or derogation in good time. For example, in the EU, Council Directive 2006/112/EC (the VAT Directive), article 323 restricts the rights of each Member State to mandate eInvoicing, as it requires buyer's prior consent for the switch from paper to electronic invoices. EU Member States considering implementation of mandatory eInvoicing will need to apply for derogation from the EU Commission.

Data protection regulations. As awareness of the need for protection of personal data increases, and surrounding regulations more protective in favour of the data subject (private individuals), implementation of CTC requires careful consideration to ensure compliance with such regulations. Regulations and best practice surrounding trade or commercial secrets should also be taken into account.

Establishing purpose for the collection and use of the reported data. Partially relating to the above Data protection regulations consideration, it is important to establish one or multiple purposes for data collection and use, as well as whether and how the data may be shared among governmental agencies in the specific jurisdiction and/or agencies in other jurisdictions.

9.2 Deployment of Peppol CTC

Becoming Peppol Authority. To deploy Peppol CTC and benefit from the available network and framework, an authorised governmental agency must become approved as Peppol Authority (PA) for the specific jurisdiction. It does not necessarily have to be the tax authority of the country, as long as the necessary regulatory and/or delegation framework has been put in place.

Adoption of country specific Peppol BIS. As each country has its own regulations for mandatory document content, especially from the indirect tax perspective, it is necessary to perform an analysis between the existing Peppol BIS specifications and the applicable local regulations to identify potential gaps. Any identified gaps can be addressed by extensions to the specifications, and any required development work should begin early to meet the required goals or timelines.

Adoption of country specific CTC requirements. Based on the analysis of Peppol BIS, the available data and the needs of the specific jurisdiction, it is necessary to identify the data to be reported to the governmental infrastructure, together with the technical format of the reported data. This can either be a local XML format or Peppol BIS (recommended), which could be more beneficial when the Peppol CTC model is adopted in several countries, as this would enable interoperability between government infrastructures.

Adoption of country-specific CTC certification requirements. The Peppol Authority, based on existing certification requirements for Peppol Service Providers (SPs), should identify whether these requirements are sufficient for their needs or whether additional certification requirements should be established for SPs to act on behalf of one or several governmental agencies in the country.

Adoption of country specific SMP requirements. It is important to decide over the SMP strategy, whether to follow the standard Peppol approach with a decentralised SMP or whether to establish a centralised SMP. The centralised SMP has several advantages, including:

- cost, which can be absorbed by the government
- reliability and non-duplication of the data
- correctness and extent of the data
- having all tax subjects registered in a single electronic company register
- hosting the register within country borders

9.3 Change management

The Peppol Change Management Policy outlines the established change management processes to the artefacts encompassed by the Peppol Interoperability Framework, including technical artefacts and specifications; Internal Regulations and Operational Procedures; and the Peppol Agreements. The policy follows a life cycle management approach to key stages, including:

- introduction of new artefacts
- change to an existing artefact
- release of a new version
- migration from an old to a new version
- removal of an old version

These stages provide the defined processes for notification, consultation, decision-making, and timelines to ensure a high-quality approach to change management.

9.4 Pace of implementation

Service Providers and businesses need sufficient time to understand and adapt to the new requirements, so that that the expected goals and outcomes can be achieved. It is advisable to have a test period to fine tune the requirements, followed by a gradual rollout to ensure smooth implementation. Rollout could be staged, based, for example, on industry segments in which tax subjects operate, or by business size. It is important to understand both buyer and supplier requirements prior to implementation to prevent failures.

9.5 Incentivising adoption

Depending on the adoption drivers, the government may decide to mandate the CTC scheme or implement it on voluntary basis. For voluntary adoption, the government may want to incentivise business to realise earlier/faster adoption of CTC. This can be done by conducting comprehensive education and awareness building and/or by creating incentive programmes, such as early supplier invoice payment, invoice or order financing, etc.

9.6 Optimisation of reporting requirements

A beneficial side effect of CTC, based on the experience of the countries that have implemented CTC, is that some elements of the pre-existing business reporting obligations can be abolished. CTC provides a significant amount of data to the government at transactional and/or line-item level in real time. Some tax administrations (eg, in Latin America) have abolished the obligation to submit certain types of aggregated periodic reporting, as these have become redundant. By combining real-time reporting obligations with routine businesses operations, a decrease in the business administrative burden can be achieved.

Annex 1: Peppol CTC compared with other CTC models

In creating this document, insights into and knowledge from more than 60 jurisdictions have been considered. The following tables provide an overview and comparison of the proposed Peppol CTC model with a few chosen CTC models. These tables are not a complete overview of the CTC models of the listed countries but represent some of the most relevant features.

	Peppol CTC	MEXICO	CHILE	ITALY	HUNGARY
Model highlights	Decentralised CTC with Regulated Exchange by accredited Peppol Service Providers (SPs) on behalf of the Tax Administration with real-time reporting of VAT subset of the cleared document to the centralised platform, both by the sending and the receiving SP; decentralised, but regulated document exchange by SPs via secure channels	Decentralised Clearance by accredited service provider (PAC) on behalf of the Tax Administration(SAT), with real-time reporting of the cleared data to SAT; validation/reporting by receiving party voluntary; decentralised and not regulated document exchange, typically via e-mail	Centralised Clearance by the central platform of the Tax Administration (SII); mandatory acceptance by the receiver; decentralised and not regulated document exchange, typically via e-mail	Centralised Exchange with document exchange by central platform (SDI) of the Tax Administration (AdE)	Real-time Invoice Reporting VAT sub-set of invoice must be reported to the central platform of the tax Administration (NAV) without human intervention immediately after invoice has been issued by the supplier; validation or reporting by the receiver not envisaged; document exchange not regulated

		Peppol CTC	MEXICO	CHILE	ITALY	HUNGARY
Document	Format	Peppol BIS	CFDI XML	SII XML	FatturaPA XML	Local XML
	Types	Invoice (inc debit/credit note), invoice response, order, despatch advice, GRN, payment instruction	Invoice, salary statement, payment confirmation	Invoice and invoice response + (optionally) despatch advise and receipts	Invoice	Invoice VAT sub-set

		Peppol CTC	MEXICO	CHILE	ITALY	HUNGARY
Clearance infrastructure	Central platform	Defined by Peppol Authority	SAT	SII	SDI (of AdE)	NAV
	Utilise existing B2G infrastructure	Possible	N/A	N/A	N/A	N/A
	Utilise existing PEPPOL infrastructure	Possible	N/A	N/A	N/A	N/A
	Responsible for document clearance	Peppol Service Provider	PAC	SII	SDI	NAV- technical clearance
	Responsible for document distribution	Peppol Service Provider	Supplier	Supplier	SDI	Supplier
	Clearance requirements	Defined by Peppol Authority	Defined by SAT	Defined by SII	Defined by SDI	Defined by NAV
	Contingency distribution	Peppol Service Provider	Supplier	Supplier	Supplier	Supplier
	Uptime SLA responsible	Peppol Service Provider	PAC	SII	SDI	N/A
	Uptime SLA	Defined by Peppol	Defined by SAT	SII	Does not exist	N/A
	Response time SLA responsible	Peppol Service Provider	PAC	SII	SDI	Defined by NAV
	Response time SLA	Defined by Peppol	Defined by SAT	SII	5 days	NAV- technical clearance
	Support SLA responsible	Peppol Service Provider	PAC	SII	SDI	N/A
	Support SLA	Defined by Peppol	Defined by SAT	SII	Does not exist	N/A
	Portal solution for SME	Any SP, or SP owned by PA	SAT	SII	SDI	N/A

Annex 1 (continued)

		Peppol CTC	MEXICO	CHILE	ITALY	HUNGARY
Business benefits	AR / AP automation-format	Flexible With Peppol BIS as format (besides mandatory elements, takes into account business elements). The structure is pre-defined, which makes it easy for the trading parties to define the necessary values	Limited Due to CFDI XML as format (takes into account only mandatory elements). Additional business information is provided in Addenda, which is a separate attachment and is based on content and format requirements of the largest buyers in the country. Currently there are c90 addenda, meaning that besides the support for the CFDI, the supplier must support creation of 90 addenda, in different formats	Limited Due to CII XML as format (takes into account only mandatory elements)	Limited Due to FatturaPA as format (takes into account only mandatory elements)	? Invoicing is not regulated in Hungary. The businesses run therefore two processes: (1) clearly defined and mandatory real time reporting process, and (2) vaguely defined invoicing process
	AR / AP automation-exchange / interoperability	Excellent Peppol Network for distribution and interoperability	Limited All distribution via e-mail. Interoperability does not exist	Limited All distribution via e-mail. Interoperability does not exist	Limited All distribution via SDI or e-mail. Interoperability does not exist	N/A
	Document exchange (between sellers and buyers) security	Excellent Encryption in place to ensure high level of security for the exchanged data	Poor Exchange typically by e-mail or print.	Poor Exchange typically by e-mail or print.	Excellent Secure connection is required with the central platform	Poor Exchange typically by e-mail or print
	Change frequency of the CTC framework	As existing Peppol infrastructure can be utilised, less need for changes or changes can be more scheduled	Due to the infrastructure being new and untested, the changes are very frequent and non-periodic in the beginning, now more stable	Due to the infrastructure being new and untested, the changes are very frequent and non-periodic in the beginning, now more stable	Due to the infrastructure being new and untested, the changes are very frequent and non-periodic in the beginning, now more stable	N/A
	Change management of the CTC framework	By SPs in their respective language, which is better for international companies	By SAT with information primarily in Spanish, which is complicated for international companies	By SII with information primarily in Spanish, which is complicated for international companies	By SDI with information primarily in Italian, which is complicated for international companies	N/A
	Change of service provider in the CTC framework	Easier and cheaper	Complex and costly	Complex and costly	Complex and costly	N/A

		Peppol CTC	MEXICO	CHILE	ITALY	HUNGARY
Other benefits	Ease of cross-border (foreign suppliers)	Flexible With Peppol BIS / International invoice as mandatory format. Foreign suppliers can send documents according to their local BIS requirements	Limited Due to CFDI XML as mandatory format. Foreign suppliers must adopt CFDI XML	Limited Due to SII XML as mandatory format. Foreign suppliers must adopt SII XML	Limited Due to FatturaPA as mandatory format. Foreign suppliers must adopt FatturaPA	N/A
	Reporting of export / import invoices by local entities	Export / import document clearance and exchange can be enabled by SPs	Export invoices must be reported, but not import invoices	Export invoices must be reported, but not import invoices	Export not widely used. Import not possible	N/A
	Authenticity of the transaction	Possible Invoice accept / approval can go via SPs and be reported to central platform. Support exists for other document types, such as orders, despatch advise, GRN or payment instructions	Not possible B2B invoice accept / approval does not pass PAC/SAT. Other document types, e.g. orders, despatch advice, GRN or payment instruction not supported	Partially possible Invoice accept / approval for can go via SPs and be reported to central platform.	Not possible B2B invoice accept / approval does not pass SDI. Other document types, e.g. orders, despatch advise, GRN or payment instruction not supported	N/A

Annex 2: Alternative approaches for Peppol CTC

During the project phase, other CTC approaches were considered by Peppol, and are discussed here at a conceptual level. While C1, C2, C3, C4 and C5 would be the same in these alternative approaches, there would be significant differences in their roles and responsibilities from a legal, technical, and operational perspective, in comparison with the preferred Decentralised Clearance model.

Centralised Clearance. In the Decentralised Clearance model, C2 and C3 perform clearance, validation, and reporting responsibilities (both standard Peppol requirements and any additional country-specific requirements). In a Centralised Clearance model, C5 will perform the additional country-specific clearance actions, while C2 will still perform the standard Peppol validations. From the perspective of Peppol service providers, this would mean that C2 will have to 'pause' the exchange flow, submit the document for clearance by C5 and only send the document to C3 upon successful clearance by C5.

Of the alternative approaches, this is probably the second-best alternative, as it provides standardisation of the document exchange process between trading parties, helping to achieve some of the benefits from building CTC on top of the Peppol Network. However, the consequence is that C5 will be actively involved in the document issuance and validation process. This requires C5 to, among other challenging requirements, ensure and maintain high SLA standards for uptime, response, and support, to ensure minimum interference in tax subject operations.

Real-time invoice reporting (RTIR). RTIR utilising Peppol would require that document exchange between C2 and C3 happens without a 'pause' for the legal clearance by C2. The Business Document will be sent from C2 to C3 immediately, and shortly thereafter C2 would submit an extract of the exchanged document to C5. The main differentiator to the Decentralised Clearance model is that the document would be exchanged between the trading parties without having the element of 'legal approval', either by C2 or C5 prior to the exchange taking place.

In this model, C2 only performs the standard Peppol validations. Country-specific controls will be performed by C5 shortly after issuance and exchange of the document. This results in legal uncertainty for the tax subjects, as the transaction may be 'rejected' by C5 in the period after issuance, so that the issuer of the document (C1) must be ready to cancel or retract the already issued document and substitute it with a replacement document to resolve the rejection reason from C5.

The rejection of a transaction by C5 post exchange between trading parties will create uncertainties that are avoided in the Decentralised and Centralised models.

Centralised Exchange. In this approach (which exists, for instance, in Italy and Turkey), Peppol has very limited to no added value, as the central governmental platform will perform both clearance and exchange of the documents between the trading parties. There will still be room for service providers that enable businesses to connect with the centralised platform.

However, as no exchange of the documents may happen directly between the trading parties directly, the many other operational benefits of Peppol are effectively diminished.

Annex 3: Role of service providers

Service providers play a significant role in supporting trading parties (tax subjects) in exchanging transactions in many diverse sectors, with different levels of maturity, utilising different types of technology platform. Service providers play an important role in supporting business compliance with regulatory obligations in the jurisdictions where the tax subjects operate, in an environment where technical compliance governmental agencies is becoming more complex.

The value offered by service providers to businesses in the modern trading eco-system can be summarised as follows:

1) **Open data exchange**

   Service providers enable businesses to seamlessly transfer transactional data, including but not limited to invoices, orders, response messages, and despatch advice. This is done in a fashion similar to that of the telecom industry, helping businesses to lower trade barriers so that they can more easily and more efficiently work with each other.

2) **Cost reduction, efficiency increase and improvement of the data quality**

   By digitising P2P and O2C processes, service providers help businesses and public administrations to reduce costs, increase efficiency and improve data quality and transparency. By delivering accurate and real time data, service providers help businesses make better decisions and eliminate the need for re-keying and data cleansing projects, whilst reducing cost and risk.

3) **Provision of value-added services and support for specialised processes**

   At the same time, the service provider's core value does not lie in the ability to transport data from point A to point B. The value proposition lies in additional services beyond the exchange of data, such as fiscal and contractual compliance, process automation, data security and integrity, data cleansing and validation, data transformation, data analytics, spend visibility, payments, financing, electronic procurement, and more.

4) **Compliance with digital controls**

   Compliance with new digital controls, such as CTC, has become increasingly complex, especially for businesses present in multiple jurisdictions. Service providers offer technology platforms connected with tax administrations across different countries. Contrary to legacy enterprise systems and software, service providers may more easily adapt to and keep up with new regulatory requirements, helping businesses to manage their tax exposures, whilst avoiding unnecessarily complications and costs for tax subject compliance.

Annex 4: Glossary of terms

Term	Definition
4-corner	Message delivery service with no external intervention
5-corner	Message delivery service where one (or more) external partner within the delivery chain
AS4	Applicability Statement 4, which is an open standard for the secure and payload-agnostic exchange of B2B documents using Web services.
Authenticity of origin	The assurance of the identity of the issuer of the invoice
B2B	Business-to-Business. For the purpose of this document, B2B includes B2G unless specifically mentioned otherwise
B2C	Business-to-Consumer
B2G	Business-to-Government
BD	Business Document, which is a transaction document exchanged between trading parties. BD can be any document supported within the Peppol Network, such as invoice, MLR
BIS	See Peppol BIS
Central platform	Centralised infrastructure deployed by the government or Peppol Authority for the near real-time collection of transactional invoice data
Certification	For the purpose of this document, refers to a process of approving software vendors as Peppol SPs by OpenPeppol or local PA for operations within the Peppol Network (4-corner model). See also 'CTC Certification' below.
Corner 1 (C1)	Sender of the document to C4
Corner 2 (C2)	Service provider acting on behalf of C1
Corner 3 (C3)	Service provider acting on behalf of C4
Corner 4 (C4)	Receiver of the document originated by C1
Corner 5 (C5) or C5 SP	In the context of this document, refers to the government-controlled infrastructure, which receives data from C2 and/or C3 CTC SP's for the purposes defined by the government or Peppol Authority and is controlled by either or both of them
Clearance	Depending on context, refers to either a CTC model or the process of a document obtaining legal validity upon issuance
CTC	Continuous Transaction Controls, a collective term for various real-time digital tax controls introduced by governments

CTC Certification	For the purpose of this document, refers to a process of approving software vendors as CTC SPs by the local PA, specifically for Peppol CTC model. Also see 'Certification'
CTN	Peppol CTC Test Network
CTC SP or CTC Accredited Service Provider	A Peppol Service Provider that has been accredited by a local Peppol Authority to perform CTC measures on behalf of the tax administration, above the standard Peppol certification
DC	Document Cleared, which is the Tax Data Document created by C2 as the part of the issuance process
DCR	Document Cleared Response, which is the document received by C2 from C5, confirming a successful reception of DC
DR	Document Response, which Is the Tax Data Document created by C3 as part of the receipt process
DRR	Document Reported Response, which Is the document received by C3 from C5, confirming a successful receipt of DR
eInvoice	An invoice that has been issued, transmitted, and received in a structured electronic format that allows for automatic and electronic processing
Government	A very broad meaning of any relevant governmental agency in a specific jurisdiction that has the mandate to control aspects of public affairs that may relate to the subject matter of this document, e.g. tax administration, ministry of finance, ministry of development, public procurement office, etc.
I&A	Integrity of the content and Authenticity of the origin
Integrity of content	The content of an invoice has not been altered since the moment of invoice issuance
Indirect tax carousel	Also called "Missing Trader Intra Community fraud" which is the theft of VAT by exploiting the way VAT is treated where the export of goods outside a jurisdiction is VAT-free
IMR	Invoice Message Response. A confirmatory message exchanged over the Peppol Network
MLR	Message Level Response. A confirmatory message exchanged over the Peppol Network
MTIC	Missing Trader Intra Community Fraud. A type of VAT fraud
Order-to-cash	The process and supporting systems to automate the chain of activities from initial sale to receipt of payment
Peppol Network	An infrastructure for exchanging information and business documents between end users in the 4-corner model governed by OpenPeppol

Peppol Coordinating Authority	The organisation with overall responsibility for governance of the Peppol Network
PA or Peppol Authority	An organisation responsible for the implementation and use of the Peppol Network within a defined jurisdiction
Peppol Service Provider	An organisation that provides Peppol Services to end users of the Peppol Network
Peppol Interoperability Framework	Collective term for the Peppol Governance Framework, Peppol Architecture Framework and Peppol Compliance Policy
Peppol Governance Framework	Collective term for the OpenPeppol Statutes, OpenPeppol Internal Regulations, Peppol Authority Agreement and the Peppol Service Provider Agreement, that together define the governance arrangements for the Peppol Network
Peppol Architecture Framework	A set of technical standards, specifications and policies that enables ongoing operation of the Peppol Network
Peppol BIS	The Peppol Business Interoperability Specifications, a set of business document specifications that enables interoperability between end users of the Peppol Network
Peppol Compliance Policy	A document outlining the guiding principles and basic rules applicable to the actors involved in the Peppol Network
Peppol Certificate	A digital certificate issued according to the Peppol Trust Network Certificate Policy
Peppol Certification Authority	An organisation issuing Peppol Certificates on behalf of a Peppol Authority and/or the Peppol Coordinating Authority
Peppol Document ID	A unique identifier assigned to any document processed in the Peppol Network
PINT	Peppol International Invoice
POC	Proof of Concept
Presentation	A non-fiscally valid version of the VAT invoice issued in an image-based unstructured format for presentational purposes
Purchase-to-pay	The process and supporting systems to automate the chain of activities from initial purchase to final payment
RTIR	Real-time Invoice Reporting
QES	Qualified Electronic Signature
SMEs	Small and Medium-sized Enterprises

SMK	Test instance of the SML
SML	Service Metadata Locator. A central service maintained by Peppol that defines the SMP used to register the receiving capabilities of a Peppol participant. Similar to how the World Wide Web is able to find websites based on domain names
SMP	Service Metadata Provider. A service where all Peppol participating organisations publish their receiving capabilities. Similar to an address book or registry containing details of participants within a community
XML	Extensible Markup Language (a structured document format)
PDF	Portable Document Format (an unstructured document)
TA or Tax Administration	Tax Administration, a government agency or department for regulation and collection of indirect tax in a specific jurisdiction
TDD	Tax Data Document created by a CTC SP based on the Business Document for the purpose of reporting to C5/TA
TS	Tax Subject, or tax subject/taxable person in a jurisdiction, accountable for tax payment and compliance
UBL	Universal Business Language, an OASIS standard for the description of business documents using the XML syntax
Validation	The process performed by C3 in the Peppol CTC model, whereby it confirms the fiscal validity of received document
VAT	Value Added Tax