A NEXT GENERATION MODEL FOR ELECTRONIC TAX REPORTING AND INVOICING

Recommendation for a decentralised approach beneficial to both economic operators and tax administrations for the digitisation of VAT reporting based on Continuous Transaction Controls and electronic invoicing

16 FEBRUARY 2022

EXPERT GROUP

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1. Executive Summary and Recommendation

This document proposes a next generation model for the reporting of VAT and similar indirect taxes to Tax Administrations, which is fiscally effective and mutually beneficial for stakeholders. It is described as the **Decentralised CTC and Exchange Model (DCTCE)**.

An increasing number of countries are implementing digital solutions to combat VAT fraud, and under-collection. The Tax Administrations of such countries require economic operators[1] to report invoice data directly from their transaction processes to complement or replace periodic VAT returns. These requirements for real-time or near-real-time transmission of invoice data to the Tax Administration for reporting purposes are often referred to as Continuous Transaction Controls (CTC), and as transaction-based reporting.

The document provides a description of the main categories of CTC Models, which differ substantially from country to country, requiring taxpayers operating in more than one country to navigate systems performing the same economic function. Most of the models implemented so far are domestic-centric, are designed from a tax optimization perspective, and are not as business-friendly as they could be. The document describes a way in which CTCs can be implemented that attain fiscal objectives for capturing invoice data in a central tax platform with the support of certified service providers operating on a decentralised basis. It can be beneficially deployed in multiple jurisdictions, and support indirect tax controls for domestic, cross-border, and multi-country operations. Whilst the core elements of such a Model would be the same across different jurisdictions, individual Tax Administrations would be able to select and embed their country-specific requirements and local practices.

The DCTCE Model simultaneously provides an Exchange Network that supports the adoption of efficient economy-wide electronic invoicing, closely integrated with the CTC functionality. This creates an attractive value proposition for supporting interoperability between economic operators of all sizes. Given that many have already made individual and collective investments in supply chain automation and electronic invoicing, the proposed model would protect and grow these benefits. It is perfectly possible within the recommended Model to provide low-cost connectivity services for small and medium sized enterprises (SMEs).

The document provides descriptions of the models used to date for CTCs, establishes and applies evaluation criteria to them, and discusses important issues impacting policy. The recommended DCTCE is presented as an innovative way to provide a balance of benefits for both public and private sector based on standards and available technology. There is a promising solution under advanced development: **Peppol CTC** which could form the basis of a multi-stakeholder approach.

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[1] Economic Operator is a business, other organisation, or person, which supplies goods or services. Depending on the context, the document also refers to roles of an economic operator, such as trading party and taxpayer.

2. Introduction

Background and Purpose

Around the world we see a sharply increasing number of implementations for the reporting, verification, and delivery of invoices (hereinafter called Continuous Transaction Controls (CTC). In most cases the main objective of the implementing Tax Administrations is to combat VAT fraud, under-collection, and error. Current solutions operational in approximately sixty countries are implemented in a very heterogeneous manner, and the implementation of the first two generations of such systems have created substantial challenges for economic operators, not to mention the Tax Administrations themselves.

This document represents the result of work recently pursued by an international group of experts with many years of experience in both tax compliance and electronic invoicing. Its recommendation aims to avoid excessive complexity for Tax Administrations by providing guidance towards a 'holistic' model that supports the requirements of all stakeholders in a balanced manner. This would deliver the following objectives and benefits:

1. Implementing next-generation tax-reporting solutions based on a central platform deployed by the Tax Administration and supported by a decentralised network of certified service providers to orchestrate the required message flows to optimise tax collection and meet the stated objectives of CTC policy.

2. Support the digitisation of invoice processing in the whole economy, for end-to-end B2B, B2G and G2B transaction streams through an integrated exchange network, thus delivering both fiscal _and_ economic efficiency (removing a 'silo' effect) and providing a business-friendly and sustainable model for all types and sizes of economic operator.

3. Avoid parallel and duplicated processes through reaping the benefits of cooperation between the private and public sectors in designing and implementing CTCs in a way that is mutually supportive and can protect investments in existing well-performing systems, such as CTC and public procurement platforms, and private sector order-to-cash and procure-to-pay processes. It can also lead to more convergence and consistency between public and private sector procurement-related message flows, creating significant economic efficiencies in the process.

4. Deliver a model that is flexible and adaptable; offers operational redundancy and continuity; allows for innovation and new developments in tax and business processes, such as meeting the needs of cross-border transactions and comprehensive reverse charge functionality; supports both invoice data and other tax-relevant data; minimises administrative burdens and promotes cost-effective tax control, auditing, compliance, and data protection routines; and leverages investments in proven standards and practices for electronic business document processing and tax compliance at the semantic and technical level, and for the operation of interoperable exchange frameworks.

The work is aligned with the over-arching objectives of international initiatives such as those of the European Commission 'VAT in the Digital Age', the OECD 'Guidance on Tax Compliance for Business and Accounting Software', the International Chamber of Commerce 'CTC Practice Principles', and the 'Global Interoperability Framework' created by a group of relevant industry associations being the USA Business Payments Coalition (USA), ConnectONCE, EESPA and OpenPeppol.

It should be explained that the OpenPeppol Association has developed a ready-made solution, Peppol CTC, based on the principles of the DCTCE Model and this is described in Appendix C. However, the authors expect further global developments in B2B and B2G interoperability to emerge from increased cooperation between stakeholder groups; for example, OpenPeppol and EESPA have recently announced an intention to use one unified interoperability network.

The authors of this document have a sincere expectation that their recommendations will influence future models for data exchange between the private and public sectors and become a catalyst for a next generation approach to the end-to-end digitisation of business and tax enforcement processes, thus contributing to long-term and sustainable economic growth and innovation, and employment.

Target audience

The target audience for this document are policymakers in countries that are seeking to modernize and digitally transform their tax and economic management. This includes but is not limited to Tax Administrations, digital agencies, and public procurement authorities that, in recent years, have been the main driver behind the implementation of CTC schemes.

The recommendation specifically addresses those governments that have not yet implemented CTCs, or those which are re-evaluating their existing model to identify areas for improvement. Given the significant impact of digitisation across the whole economy, and the increasing use of digital tools and data exchange models by the public and private sector, a wider audience of policymakers concerned with improving productivity may also wish to consider the implications of the recommended approach and the fundamental nature of the choices they imply.

The document is also relevant for international organisations such as the OECD (Organisation for Economic Co-operation and Development), CIAT (Inter-American Center of Tax Administrations), IOTA (the Intra-European Organisation of Tax Administrations), ICC (International Chamber of Commerce), the World Bank, and BPC (Business Payments Coalition-USA), as well as regional organisations, such as the European Commission, and regional development banks. Finally, taxpayers and economic operators, can benefit from reading this document to increase their knowledge of the various CTC models and exchange networks, to prepare for potential developments and advocate a 'win-win' implementation.

3. Existing e-Invoicing and CTC models

Although e-invoicing systems designed for national use and CTC models are country-specific and vary from each other at a detailed design and implementation level, they can be grouped into broad categories based on their most typical features:

1) Interoperability Model
2) Real-time Invoice Reporting Model
3) Clearance Model
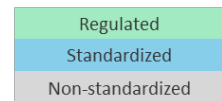4) Centralised Exchange Model
5) DCTCE
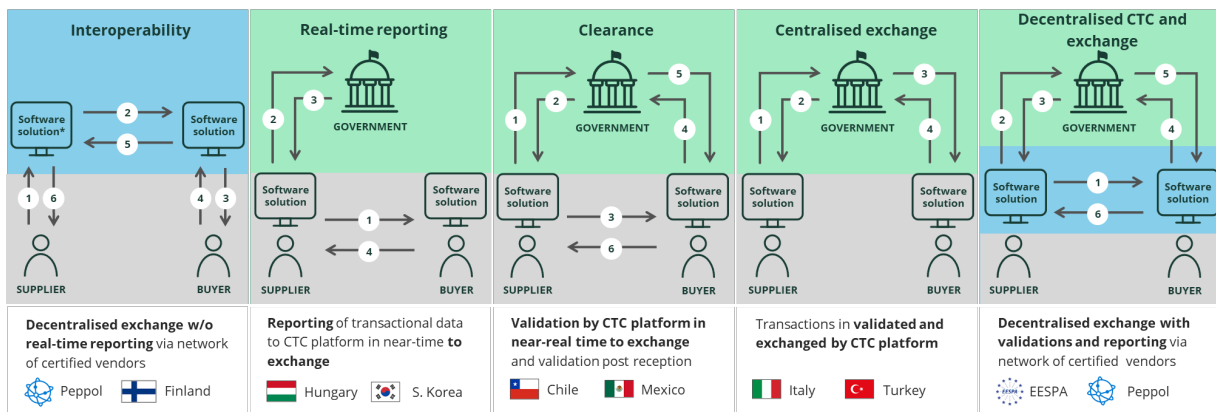
* Software solution could be among others ERP vendor, Service Provider, EDI Provider, Workflow solution, or even the taxpayer if it has passed the necessary certification.

Regulated
Standardized
Non-standardized

In summary, these systems vary radically in the specific functions undertaken, and these are depicted in the conceptual diagrams above, and range from reporting only, reporting with the addition of validation/approval, the provision of a centralised delivery capability (in substitution for the commonly available Interoperability Model or other means of delivery such as bilateral transmission), and a decentralised exchange model with the addition of CTCs. The latter, being illustrated in the diagram to the far right-hand side above, is the **focus of the core Recommendation in this document.**

It will be noticed in the above diagrams that the *shaded* 'zones' of exchange activity can be described as:

1) Regulated (Green): in this zone of exchange activity, all data and transmission standards for electronic documents to be exchanged within the regulated activity are specified by a government agency, such as the Tax Administration or a governmental digital management service and must be implemented as a legal requirement by the certified service providers and software solutions that interface with the government on behalf of economic operators. The relevant data standards are preferably selected from commonly used standards appropriate to the business requirements of the system in question to facilitate interoperability with and between CTC systems. The invoice data may be contained in a full dataset or a sub-set of a full dataset.

2) Standardized (Blue): There are a variety of international, regional, national, and industry-specific standards for the issuance, exchange, and reception of electronic business documents curated by Standards Development Organisations for use in interoperable exchange networks, for example in the Model depicted in the far-left hand diagram above. Such standards may also be used or adapted for use both in the Regulated zone of activity depicted in Paragraph 1) above, and in the case of an integrated zone of interoperable exchange activity as depicted in the decentralized model shown in the far-right diagram. These standards will often have a core technical specification, but also permit variations, which the parties may mutually agree as part of operating rules, and which are embedded in existing EDI set-ups. However, such parties need to be mindful of the fact that when operating in the Regulated (green) zone they are obliged to use the Regulated standards.

3) Non-standardized (Grey): in this zone of exchange activity, there is full freedom for the involved parties, the certified service providers interacting with each other, and with their clients, the economic operators. In a four-corner model, the 'first and last mile' services in the communication chain are typically offered by service and solution providers selected by the economic operator.

A detailed definition and description of each model can be found in Appendix A to this document except for the DCTCE Model which is fully described and discussed in the Section 5.

For clarity, the aspects of electronic invoicing described in this document focus on mechanisms for the reporting to Tax Administrations and delivery of e-invoices between trading parties through service providers. It does <u>not</u> go into detail as to how economic operators use and deploy internal and external systems to issue, process, and control e-invoices. The latter, of course, then become the object of CTC reporting and delivery through interoperable exchange networks that are described in detail in the document.

It is intentional in this document to include both CTC models and models that perform adjacent functions such as interoperable invoice exchange separately from the actual CTC operations. These descriptions provide evidence that these functions can and should be considered together and draws the conclusion that collectively there exist the tools and capabilities to meet both sets of requirements in an integrated way i.e., both CTCs <u>and</u> end-to-end electronic invoicing.

4. Comparison of available CTC models

The table below represents a brief overview of how the main CTC models[2] are aligned with evaluation criteria, which are framed both from economic operator and Tax Administration perspective, and described in Appendix B. It is recommended that the reader familiarise themselves first with the main models that are described in Appendix A.

The general conclusion can be drawn that from a fiscal point of view the CTC models are all capable of delivering the desired fiscal benefits, but that wider economic benefits and ease of use for economic operators vary considerably.

Building blocks & evaluation criteria	Real-time Invoice Reporting	Clearance	Centralised Exchange	DCTCE
Ease of implementation / use for governments	🟡	🟡	🔴	🟢
Ease of implementation / use for SMEs	🟡	🟡	🟢	🟢
Ease of implementation / use for larger economic operator and MNC	🟢	🟡	🟡	🟢
Incremental deployment	🔴	🔴	🔴	🟢
Leveraging existing standards and investments	🔴	🔴	🔴	🟢
Single point of failure	🟢	🟡	🔴	🟢
Interoperability	🔴	🔴	🔴	🟢
Maintenance and support	🟢	🟡	🔴	🟢
Data confidentiality	🟢	🔴	🔴	🟢
Supply chain automation	🟡	🔴	🔴	🟢
Innovation and value added	🟡	🟡	🔴	🟢
Cost of change, as equitably allocated	🟡	🟡	🔴	🟢

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[2] The Interoperability model has not been added in this table, as it does not offer mechanisms for real-time submission of transaction data to the government.

Colour coding

Colour	Explanation
	Meets the ideal/target requirements
	Could meet the ideal/target requirements
	Has significant drawbacks in meeting the ideal/target requirements

# 5. The Decentralized CTC and Exchange Model (DCTCE)

While there is not yet a real-life example of a country to have implemented such a Model with the full integration of CTC functionality, there are reasonable grounds to suggest that this is the most optimal CTC model balancing governmental and business needs.

Key features

- Data validation and exchange is performed by certified service providers, not by a central platform (the government CTC Platform is released of a heavy technical burden).
- All certified service providers need to adhere to predefined minimum technical standards, to ensure system interoperability (both domestic and cross-border) but can use other agreed standards outside the regulated standards zone for tax reporting and clearance.
- This Model allows economic operators to leverage existing investments in interoperability, and Electronic Data Interchange (EDI).
- It also allows governments to leverage existing core investments in Tax Administration platforms and in public procurement platforms instead of building from scratch.
- Only a subset of the exchanged business document, e.g., invoice, need be submitted to the central platform (data minimisation).
- The submission of the data subset takes place instantly after the issuance and exchange of the business document (uninterrupted supply chain).

Besides purely technical advantages compared to other CTC models, the following benefits can be achieved:

- **Modular (step-by-step) deployment**. The DCTCE Model would consist of multiple modules, which do not necessarily have to be deployed at the same time. Deployment may be gradual depending on the needs and maturity of the market and/or of government platforms. The model may be implemented without a central CTC Platform being in place, purely to take advantage of the many benefits of interoperability for B2B and B2G exchanges between economic operators. CTC always be added subsequently. All this can be achieved without significant impact on the economic operators, as it will be the certified service providers, which manage the required step-by-step upgrades.
- **Tax control customisation**. Tax Administrations have varying requirements regarding the level of detail they wish to obtain under a reporting or clearance system. DCTCE supports such an approach. Tax Administrations may choose data elements from the master-set to form the sub-set to be submitted, choose whether the reporting should be done only by the sending side or as well by the receiving side, and choose whether other messages, documents, and information should be reported, such as acknowledgements, logistics, or orders.
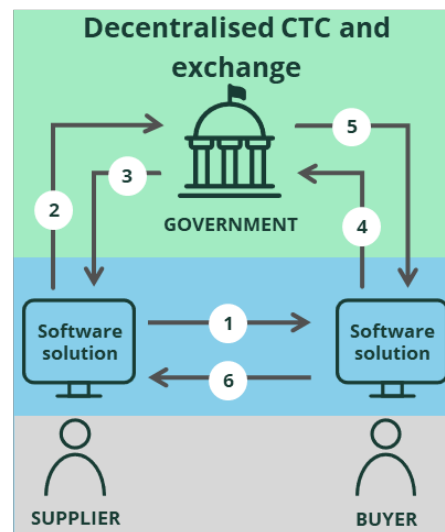
- **Leveraging existing B2G infrastructures**. Some countries have deployed e-invoicing infrastructures for the exchange of invoices and other documents between public sector contracting authorities and their suppliers, e.g., under a public procurement policy framework, the so-called B2G e-invoicing. These platforms can continue playing their role in the new DCTCE ecosystem.

- **SME-friendly**. Governments can provide its own low-cost or free access interface for SMEs to be integrated within the exchange network, either by building a brand-new solution or using an already existing B2G infrastructure, which provides the required services to SMEs. Alternatively, they can let SMEs select a market solution, which provides additional value-added services and a level of customer service that a government body may find challenging. In establishing the DCTCE Model, the prominent issue of SME-friendly services could be addressed through incentives, clear criteria (such as portal-based services for less than 100 invoices p.a.), and support for parties that successfully on-board SMEs.

- **Future-proofing existing business investments**. As DCTCE, from a technical perspective, prescribes a minimum set of common technical standards to be used in exchanges between the economic operators and their certified service providers, thus maintaining existing investments in EDI technology on the condition that that the capabilities are certified under the DCTCE schema.

- **Use of widely accepted technologies and technical standards**. The DCTCE model implementations will be able to adopt well established and endorsed technologies, such as:

  - [AS4 technology for secure transmission has been adopted and promoted by various EU projects and initiatives](). The transmission protocol also uses well-accepted headers/envelopes, and response and status messages. For example, the protocol is already embedded in Peppol, the EESPA Interoperability Network (in roll-out) and the BPC (USA) Exchange Network.

  - Standards compliant with the [European Norm for the semantic information elements of an electronic invoice]() (EN16931), which has been adopted in nearly all EU Member States to comply with the [Directive 2014/55/EU](), and which has been recommended in non-European situations, as a fit-for-purpose dataset. It is available in common syntaxes such as UBL and UN/CEFACT.

- **No single point of failure or dependency**. To ensure business continuity, in DCTCE, a network of certified service providers validates and exchanges the business documents. The data is provided to CTC Platform only after the quality and compliancy of the data has been ensured by the service providers. This approach ensures proper business continuity and well-being of the supply chains.

- **VAT compliance by design**. DCTCE builds upon the principle that compliance is built into the regular business processes, such as issuing and receiving orders, invoices, or responses to such documents and using that transaction cycle to generate the required CTC message flows through the network of certified service providers. There is no additional operational burden imposed on economic operators and the Tax Administration would be relieved from much of the messaging choreography.

- **Data confidentiality by design**. With the GDPR requirements in mind, DCTCE supports data minimisation and provision of the data to the CTC Platform on need-to-know basis. The certified software providers will extract a data subset that is relevant for a Tax Administration to effectively perform its tasks, with other 'irrelevant' data never being exchanged with the CTC Platform. In addition, the exchange network component provides secure and encrypted transmission for the commercial data, more robust than email and other insecure methods of communication.
- **Facilitation of cross-border trade** can be supported by the model through inter-linking mechanisms between different national instances of the DCTCE model, or the creation of a specialised CTC instance catering for cross-border trade within an integrated Single Market such as the European Union. Such exchanges can include both tax reporting and underlying e-invoicing and related messages.
- **Embedded network functionality**. The recommended Model removes from the direct responsibility of a Tax Administration the provision of the actual Interoperable Exchange Network that is required to meet the manifold delivery needs of economic operators for all the required documents required. The Decentralised CTC Exchange Model is juxtaposed and embedded in a seamless integrated interoperable way with the centralised Tax Administration platform.
- **Governance**: governance responsibilities lie where it makes sense. All tax related functions and policy areas remain with the Tax Administration /Government, whilst the exchange network dimension can be managed on a multi-stakeholder basis as befits the heterogeneous nature of the parties.

The authors of this document believe that regulators, Tax Administrations, governments, and stakeholders generally should consider the DCTCE as a promising template for implementation, and as the basis for establishing pervasive interoperability between a Tax Administration and economic operators, their service and solution providers, and all combinations thereof.

6. Discussion of specific issues arising in the evolution of the broader regulatory reporting and exchange network landscape for digital transactions

The following four paragraphs discuss key aspects of the regulatory reporting landscape and identify issues and perspectives that have a bearing on the future development of the systems described in this document. The authors believe that they provide key insights as to why the architecture recommended in the document is compelling and promising for wide adoption.

1. Significant differences between Periodic Transaction Controls (PTC) and Continuous Transaction Controls (CTC)

Digital Reporting Requirements are the mechanisms through which taxpayers report VAT or other indirect tax data at various transactional levels to the Tax Administration. TAs are increasingly distinguishing between Periodic Transaction Controls (PTC), e.g., reporting based on the SAF-T standard, VAT Listing, and Continuous Transaction Controls (CTC) e.g., real-time reporting and clearance of e-invoices. These mechanisms vary technically and require different data submission frequencies. But there are even greater differences that make clear that the various mechanisms should not be mixed-up or conflated.

It must be borne in mind that the required reporting data may often reside in different systems of a taxpayer, and different departments may be working with specialised streams of data with different access rights and controls. Furthermore, systems designed for 'dynamic' data exchange differ fundamentally from systems whose principal purpose is accounting or record-keeping. Combining such varying types of information without considering these limitations and differences poses a significant burden on taxpayers. The negative impact on economic operators could be both a much higher upfront investment to ensure compliance with new CTC requirements, as well as severely reducing their flexibility to adopt evolving technologies and processes that are optimized for specific business purposes, unless the CTC systems are designed to be sensitive to data management challenges for economic operators.

Examples of countries with such intermingling of models, are Greece's myDATA reporting scheme, and Spain's SII reporting obligation. While myDATA and SII are often classified as 'real-time reporting', but compared to the Hungarian reporting obligation, they are distinctly different: in Hungary, only transactional data is being reported in real-time to the Tax Administration, whilst in Greece and Spain additional accounting data on inventories and other assets must also be provided. This has a variable impact on set-up and operating costs and the cost of compliance for economic operators.

2. Significant definitional differences between e-invoicing model implementations

While many reporting practices and regulatory schemes around the world are referred to as 'e-invoicing,' the existing implementations around the world differ substantially.

'E-invoicing' is **the complete replacement of paper invoices with structured electronic invoices** capable of being exchanged between economic operators and automatically processed. Where e-invoices or data extracted from e-invoices are used to report information to Tax Administrations this is not strictly e-invoicing <u>unless</u> it also includes or is accompanied by the processes described in the preceding sentence. By itself, such practices without the true e-invoicing step should be more properly referred to simply as 'reporting'. Therefore, when e-invoicing is being discussed in the context of CTCs caution should be exercised to use precise definitions.

The DCTCE simultaneously addresses the twin opportunities of optimal fiscal reporting and unlocking the business efficiencies of e-invoicing and potentially supply chain automation. Whilst various models are discussed in this document, it is helpful to illustrate differences among the various existing methods in connection with submitting indirect tax data to Tax Administrations i.e., VAT Listing, use of the SAF-T reporting standard, real-time reporting, and the use of e-invoicing.

It would be very worthwhile to prepare an assessment of the benefits and costs, including set-up, future change, and operational, of the various CTC Models, and it is intended to undertake follow-up work on this aspect drawing on existing sources and further analysis to provide an additional annex to this report during Q2 2022.

3. Significant challenges in implementing a single government-provided centralised Exchange Model

One approach to CTC, which is often referred to as the Centralised Exchange model, has recently attracted significant attention from analysts and Tax Administrations. Under this approach, the CTC platform does not just receive real-time or near-real-time business data but acts as the sole or dominant invoice exchange network or hub for the entire economy. Examples of countries with a centralized exchange model are Italy, Turkey, and Kazakhstan.

Without a doubt, these implementations pose challenges as they replace market-driven e-invoicing solutions with a single government-operated platform. While in the short term these implementations may appear to meet key policy goals such as the rapid onboarding and free service provision for SMEs, these benefits come at a considerable economic cost or under-achievement of economic benefits, as the government platform will almost certainly not be as effective as multi-stakeholder solutions in embracing innovative new technologies and business processes and in allowing for well-supported service extensions. Furthermore, these platforms need to process an immense volume of data, ensuring continuous uptimes and immediate response times. By creating a 'single point of failure' for all critical data flows in an economy, any disruption in performance by the central CTC platform could jeopardize supply chains and consumer trust.

As set out in the document the recommended DCTCE offers the 'best of both worlds' by supporting the CTC requirements relevant to the Tax Administration, and the needs of the whole economy for a highly performant exchange model meeting the needs of heterogeneous economic operators, as the compliance aspects desired by the government will be embedded within user-friendly business processes. This model will not create an additional compliance burden for the economic operators since the tax reporting of invoice data will be undertaken by the certified service providers.

4. Significant challenges in meeting data confidentiality and privacy requirements

In the view of the authors, it is also difficult to ensure data confidentiality and privacy in the Centralized Exchange Model or in certain clearance models.

By contrast, the recommended DCTCE addresses this challenge by 'ring-fencing'. Data sharing is by design on a on 'need-to-know' basis, meaning that no more data than is needed for the government to perform its responsibilities is being shared with the latter, and the confidential commercial data transmitted between economic operators is securely safeguarded in the extremely secure and reliable exchange network component. In the DCTCE only a subset of the business document, e.g., invoice, need be reported to the CTC platform. For the aspect of confidentiality, this would make the Model fully compatible with other reporting methods such as VAT Listing, SAF-T based reporting, real-time reporting, and e-invoicing solutions.

In other respects, the advantages of the recommended model are described in other sections of the document.

7. Closing statement

The Authors of this document would be pleased to discuss the recommendation and analysis set out in this document in more detail. This could take place in meetings, presentations, online webinars, and conferences.

They believe that there will be substantial support for these proposals, or a version of them, to deliver an effective operational environment for meeting the twin objectives of fiscal integrity and economic efficiency for all stakeholders. There are undoubtedly significant savings and additional value-added to be generated based on the decentralised model – DCTCE – described here.

It is the intention of the Authors to seek widespread international support from relevant organisations, associations and communities, as potential endorsers of these proposals.

8. The Authors

Alexander Kollmann leads a team of international tax technology specialists at the Schwarz Group to implement globally standardized CTC tax reporting solutions for the group. He contributes to various working groups at the International Chamber of Commerce (ICC), and the German IDSt: Institute für Digitalisierung im Steuerrecht , that is dealing with optimizing mandatory e-invoicing, tax-reporting and fiscal requirements for till receipts. As one of the founders of the LinkedIn group "TaxVoice" he organizes free webinars to exchange experience with other multinational companies dealing with the same challenges.

Bruno Koch is a global industry analyst and consultant. As the owner of Billentis, he is a pioneer in e-invoicing and digitisation with 25 years of experience. He has advised companies, solution providers and governments in 52 countries and is involved in numerous working groups on the subject of e-invoicing and the fight against VAT fraud.

Charles Bryant is a consultant, consensus-builder and editor in e-invoicing and related areas. He was a founder, co-chair and secretary general of the European E-invoicing Service Providers Association (EESPA) involving participation in numerous industry forums. Prior to that, he was at the European Payments Council, SWIFT, and held senior roles at international banks.

Christiaan van der Valk is Vice-President, Strategy and Regulatory for Sovos Compliance, which recently acquired TrustWeaver that he co-founded in 2001. As Vice-Chair of the International Chamber of Commerce Commission on the Digital Economy, he leads ICC's cross-functional public and private sector initiative to develop global good practices for Continuous Transaction Controls (CTCs). He is Chair of the Public Policy and Compliance Working Group of the European E-invoicing Service Providers' Association (EESPA) and is active in numerous policy, standardisation and industry forums.

Nazar Paradivskyy is a Vice President of Regulatory Affairs with Pagero Group and leads Pagero's global e-invoicing and CTC compliance practice. He actively contributes to industry associations including EESPA and OpenPeppol, where he is the Leader of Peppol CTC Community and one of its key architects. In his various roles, Nazar has frequent and ongoing dialogues with governmental agencies across the globe, including tax administrations, on the matters of e-invoicing and CTC.

Ruud van Hilten is Vice President Product Compliance at Tungsten Network. During his 16+ years of experience, Ruud has supported some of the largest global enterprises in the successful implementation of e-invoicing projects and also works directly with government agencies. Ruud is a frequent public speaker and active in industry associations, being a member of the executive committee of EESPA (European E-invoicing Service Provider Association) and of EESPA's Public Policy and Compliance Working Group.

Appendix A: Overview of four other CTC and e-invoicing implementations

1) Interoperability Model

This model is <u>not</u> by itself a CTC system, but rather a commonly used interoperability mechanism for e-invoicing and related supply chain document exchanges. It is relevant here because the delivery component will always be present in e-invoicing, with or without CTC, and such models are already a tried and tested means of delivering transactions accurately and efficiently to and from economic operators. It uses a network of service providers in a four-corner model that use an agreed document format and exchange methodology to deliver business documents. Tax Administrations and taxpayers benefit from the transparency of data being exchanged in terms of auditability and compliance.

Decentralised exchange w/o real-time reporting via network of certified vendors

Peppol   Finland
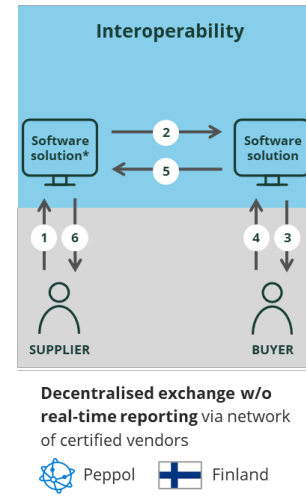
Key features

- Tax Administrations set the overall fiscal rules framework to be followed by taxpayers for the issue, exchange, and receipt of compliant e-invoices.
- In terms of governance, various situations are common. The Network Governing Entity may be a private sector or public body and typically operates on a not-for-profit basis. It determines by consensus the business rules and technical standards for the supported document formats and message exchange.
- The technical standards in use may be national, regional, or international and available on an open and freely available basis, and with country-specific variations.
- Data is available for audit in a unified and structured format by the end-user or its service provider.
- The model supports automation of both accounts receivable (Order-to-Cash) and accounts payable (Procure-to-Pay) processes on behalf of economic operators.
- In addition to the Invoice, the model permits the exchange of related document types, such as purchase orders as well as timely transaction status messages.

Discussion of model

- The Interoperability Model is considered by many to be an essential prerequisite for the universal adoption of digital processes and exchanges by economic operators.
- In many environments, government is a resolute supporter of the establishment of such infrastructures, or may be the prime mover or investor, or is strongly engaged as a leading player in a multi-stakeholder governance entity.
- The multi-stakeholder model is seen to be compelling given the various interests to be included, but, policy considerations, and local, cross-border and industry sector requirements will drive the strategy.
- In recent times thought has been given to the inclusion of facilities to meet real-time tax controls (CTC), within such an Interoperability Model. This could be achieved by a

'linking' mechanism to allow users of the interoperability network to interoperate with the Tax Administration, through a 'fifth-corner' channel.

- The Tax Administration may also wish to insist that solutions certified to deliver tax reporting data to it must also have access to the appropriate Interoperability Model(s).
- Government might also seek to offer or fund technical tools, a case in point being the European Commission CEF Digital artefacts now in wide use for multiple use-cases across the EU.

2) Real-time Invoice Reporting Model

The taxpayer reports the invoice, or a subset thereof, to the Tax Administration or a government agency acting on its behalf shortly after the issue and exchange of an invoice between the trading parties.

Key features

- A central processing platform is established by the Tax Administration
- The platform requires use of accredited software solutions for access and processing
- Taxpayers submit the invoice itself, or a subset of invoice data within 24-72 hours of invoice issuance with variations as to frequency intervals
- The system is mandatory for larger economic operator and MNCs but is extensible to SMEs.
- The submitted dataset could be generated fully from data in the invoice, or the submitted dataset requires data not available in the invoice
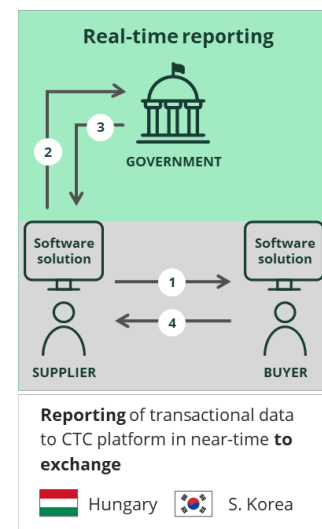
Discussion of model

- Aside from fiscal rules, invoicing itself is often not regulated, and economic operators may use formatted electronic invoices, or more commonly a humanly readable representation (PDF) or traditional paper. E-invoicing may be encouraged for economic efficiency reasons.
- Taxpayers need to implement different solutions and processes: one for real-time reporting and another for invoicing and/or e-invoicing. The process may require data beyond that typically contained in the invoice, (e.g., financial accounting data), thereby increasing the initial investment cost and ongoing maintenance costs.

3) Clearance Model (with variations)

This model provides invoice clearance (fiscal validation and approval) before or after issue of the invoice to the buyer. Precise functionality varies. Clearance may be provided by a central platform or through a network of accredited service providers. Invoice and related document exchanges takes place directly between taxpayers/economic operators, with or without the support of service providers. These latter processes are not regulated by government.

Validation by CTC platform in near-real time to exchange and validation post reception

Chile   Mexico
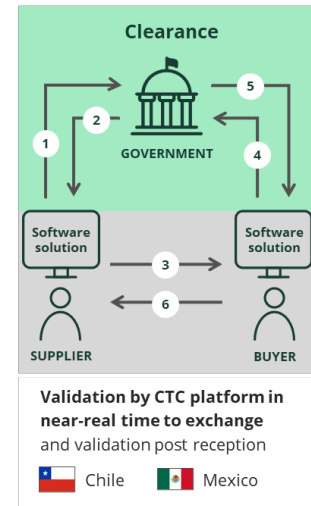
Key features

- A central data repository and platform is established by the Tax Administration.
- The Tax Administration specifies a structured invoice format to be used by taxpayers
- The supplier submits the invoice to the designated platform hosting the central data repository to obtain clearance (fiscal validity) of the document.
- The designated platform clears (gives fiscal validity) the invoice, thus allowing the supplier to send the validated invoice to the buyer.
- The buyer validates the invoice to the designated platform by acknowledging its validity prior to payment.
- These processes will be different if the clearance process is delegated to accredited service providers.

Variations

The Clearance Model has many variations based on country preferences, in particular the timing of the clearance step (validity and approval), and whether the process is centralised or decentralised, as below:

- **Pre-clearance** (also referred to as hard clearance) – where invoice clearance occurs prior to exchange between taxpayers being the economic operators.
- **Post-clearance** (also referred to as soft clearance) – where invoice clearance may occur in a short timeframe after the exchange between taxpayers.
- **Centralised Clearance** – where clearance is performed by the centralised platform 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 central platform of the Tax Administration, for logging in the repository.

Examples of implementation variations of the invoice clearance model:

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

Discussion of model

There are several challenges and concerns for taxpayers in operating inside such a model:

- The clearance document format does not create a standard for the invoice generally and is focused on the needs of the Tax Administration
- There is no automatic interoperability between the economic operators, i.e., the buyers and the sellers. There is often a resort to email as the predominant exchange mechanism
- It requires intermediary service providers to act between the central platform and the economic operator.
- By itself, it makes no contribution to the automation of accounts receivable and accounts payable functions and requires to be backed up by economy-wide digitisation initiatives including the adoption of e-invoicing to achieve benefits beyond the purely fiscal.
- For taxpayers operating in more than one country, the sheer variety and topology of such systems is demanding and resource intensive.

4) Centralised Exchange Model

This Model may be an additional feature of the Clearance Model discussed above, or a model which, for example, supports public procurement. It is provided by government and replaces the direct exchange of documents between the economic operators themselves for the defined circumstances. The exchange functionality may be used for only B2G transactions or for both B2G and B2B transactions.

Transactions in **validated and exchanged by CTC platform**

🇮🇹 Italy　🇹🇷 Turkey

Key features

- A central platform or network is established by a government agency.
- E-invoices are exchanged between buyers and sellers through the central platform or network.
- The central platform may integrate with the Clearance Models, described in the preceding section, by having the right to fiscally validate transactions.
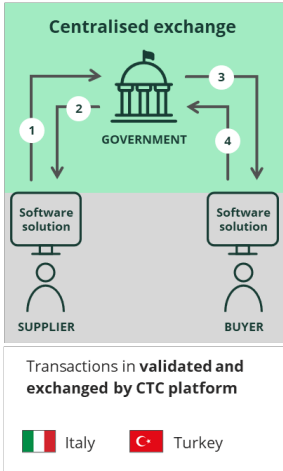
- There are variations, for example by offering connectivity to widely available interoperability networks to support both domestic and non-domestic flows.

Discussion of model

- The document format may be influenced by the needs of the procurement/Tax Administration, rather than economic operators seeking supply chain efficiencies.
- Interoperability between buyers and sellers may be limited to specific invoice document exchanges rather than the full range of business document thereby inhibiting full automation of accounts receivable and accounts payable functions.
- It leads to proliferation of separate solutions and processes needed for the related documents, such as purchase orders or indeed the actual commercial invoice, which may be exchanged directly between the trading parties to overcome the invoice format limitations.

Appendix B: Legend for Evaluation Criteria

Building blocks & evaluation criteria	Explanation
Ease of implementation / use for governments	What kind of administrative, technical, and political burdens the model will impose: • Since such an infrastructure can deliver both digitisation benefits in the form of e-invoicing as well as the fiscal benefits of CTCs, is the implementation path modular (phasing-in of functionality)? • What will be the extent of functional requirements, for example: data gathering, data exchange, validation, analytics, and uptime and response times? • Whether the model ensures business needs of both SMEs and larger economic operator and MNCs. • Whether the model allows for incremental change and improvement. • Whether all required use cases and functionalities have been thought through, so that updates and changes do not spark further disruptive change after going live. • Whether the model will contribute to business efficiency and growth as well as improved tax collection.
Ease of implementation / use for SMEs	How simple and cost efficient the model is for SMEs both to implement and use. Other criteria considered among others: • The existence of low-cost or free-for-use access solutions for SMEs (e.g., provided by the government) or other low-cost alternatives provided by market solutions. • Whether for SMEs the solutions provide easy reach to their trading partners (e.g., through a single e-registry of economic operators and the possibility to use a single solution to both deliver end-to-end e-invoicing and fiscal reporting). • Whether the model embeds fiscal and business compliance processes within the normal business cycle, such as VAT rules for invoices, and exchanging orders, invoices, and despatch advice, so that compliance does not become an additional burden. • Whether the model can support the principle 'get data right from the beginning'

	• Whether the model does not create unnecessary 'lock-in' effects, meaning that switching from one solution provider to another does not result in unreasonable or predatory costs for an economic operator.
Ease of implementation / use for larger economic operator and MNCs	For larger economic operator and MNCs the model should consider the following: • Limit the variety of both fiscal reporting (e.g., CTC <u>and</u> e-invoicing models that they must comply with per country and from country to country • Capable of simplifying cross-border and multi-country trading, as well as domestic trade (future proof) • Supports improvement of supply chain relationships with all suppliers and buyers
Incremental deployment	• For governments, whether the model is capable by design to cater for incremental extensions of reporting obligations with limited additional investment e.g., data on additional business documents. • From an economic operator perspective, whether the model allows the use of the same technology platform and standards for both supply chain automation, and tax reporting whilst maintaining the confidentiality of segregated data streams (reporting to government as opposed to commercial contracts). • Whether the model allows for groups of stakeholders (government itself and user segments) to adopt the fiscal <u>and</u> supply chain automation solutions at different speeds (flexibility for policymakers)
Leveraging existing standards and investments	Whether the model allows governments and economic operators to leverage open, internationally accepted and proven standards, and to leverage existing infrastructures and processes in which they have invested. For example: • Investments governments have made in B2G procurement platforms, • Investments governments have made in SME solutions, • Investments by economic operators in existing exchange and EDI solutions and software, and invoice/ supply chain interoperability tools.

No single point of failure	Evaluation of any single points of failure to exchange, validate or clear invoices and other business documents, both for reporting and among trading parties, which otherwise may cause disruption in supply chain processes, including systemic risks.
Maintenance and support	Whether the service levels offered under the model provide for high quality support and stable maintenance for all the involved stakeholders especially economic operators. • Assessment as to whether maintenance of the model is subject to continuous change and disruption, and whether the provided support is insufficient quality, e.g., long waiting times, inadequate quality responses, lack of support in other languages.
Interoperability	• Whether the model allows for usage of interoperable standards, meaning that same or similar standards can be used across multiple purposes and jurisdictions by Tax Administrations and economic operators • Potential for governments to tackle cross-border tax fraud and evasion more efficiently.
Data confidentiality	Whether the model can be designed and implemented in a way to ensure data sharing on need-to-know basis, meaning that no more data than needed for the government to perform its responsibilities is being shared with the latter, e.g., • Sharing the full data of a business document, such as the invoice, could be seen as negative, as it normally holds much more data than that is required under the national indirect tax or other relevant regulations. • Supports the principle that only a subset of a document, as defined to perform the intended responsibilities, should be shared with the governmental infrastructure. • Also, whether the transmission method in the related Exchange Networks is secure and encrypted or use email or other insecure methods of communication.
Supply chain automation	Whether the model fully supports does not unnecessarily disrupt or otherwise interfere with established or potential supply chain operations.

	Whether compliance is embedded within such processes and not an additional parallel burden.
Innovation and value added	Whether the model offers either immediately or within a reasonable timeframe the potential to further innovate in digitisation and value-add services to economic operators for example: real-time financing, payment services, analytic services, and accounting services etc.
Cost of change	Whether the cost of implementation is likely to be reasonable from the use of open standards and practices, the protection of investments already made in existing platforms and exchange networks, and predictable operational and project costs.

Appendix C: Further Information on the DCTCE implemented as Peppol CTC

One example of how the DCTCE can be deployed is Peppol CTC. The system has been designed and constructed in way that fulfils the business and technical requirements of the model.

Input and feedback have been gathered from five Tax Administrations, with other Tax Administrations observing the outcome of the project. The model is available for testing in 'playground' or prototype environment by governments, software providers and economic operators. The Peppol Exchange Network as a world-class Interoperability Model deployed and successfully operating in many countries.

Peppol CTC does not have to be the exclusive standard for implementation of a Decentralised CTC and Exchange, but it could serve as the minimum common denominator that all parties adhere to, while allowing for other standards and practices by mutual agreement.

Peppol has substantial experience of operating an infrastructure through its members, which is based on a core set of standards but allows for variations in terms of the transmission protocol and document to suit country requirements. Peppol CTC is designed as an additional module of functionality that can be adopted as an extension of existing functionality.

The following paragraphs and diagram describe how Peppol CTC message flows take place (see Appendix E: Glossary of Terms for definitions of abbreviations and terminology.)

Transaction steps:

- Corner 2 (C2) and Corner 3 (C3) service providers must complete CTC certification, as per the requirements established by the Tax Administration (TA) in the specific jurisdiction.
- C2, upon receipt of a business document from C1, performs validation in real-time to ensure compliance with defined requirements.
  - When performing validation, C2 confirms compliance with the standard Peppol content validation requirements (that are based on country-specific indirect tax content requirements) and any additional country-specific validation requirements (e.g., beyond what is expressed in the indirect tax regulations) set by the TA in consultation with the user community.
- C2 sends the validated business document to C3 in real-time.
  - Simultaneously C2 initiates immediate transmission of the business document as a subset (or complete, if so, decided by the TA) to the Corner 5 (C5) provider (access point for the TA platform).
- C3 upon receipt of the business document for onward transmission to C4, validates it and creates a subset thereof according to the requirements set by the TA, and reports it in real-time to C5 for matching with the subset transmitted by C2 to C5.
  - Validation and reporting by C3 is an optional feature for the TA to decide whether or when to deploy.

- 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). TA can decide whether to require reporting of Invoice responses.
- Business document exchange between C1 and C4, and data collection and fiscal control by C6 are performed as a single real-time process.

More detailed description of Peppol CTC can be found here.
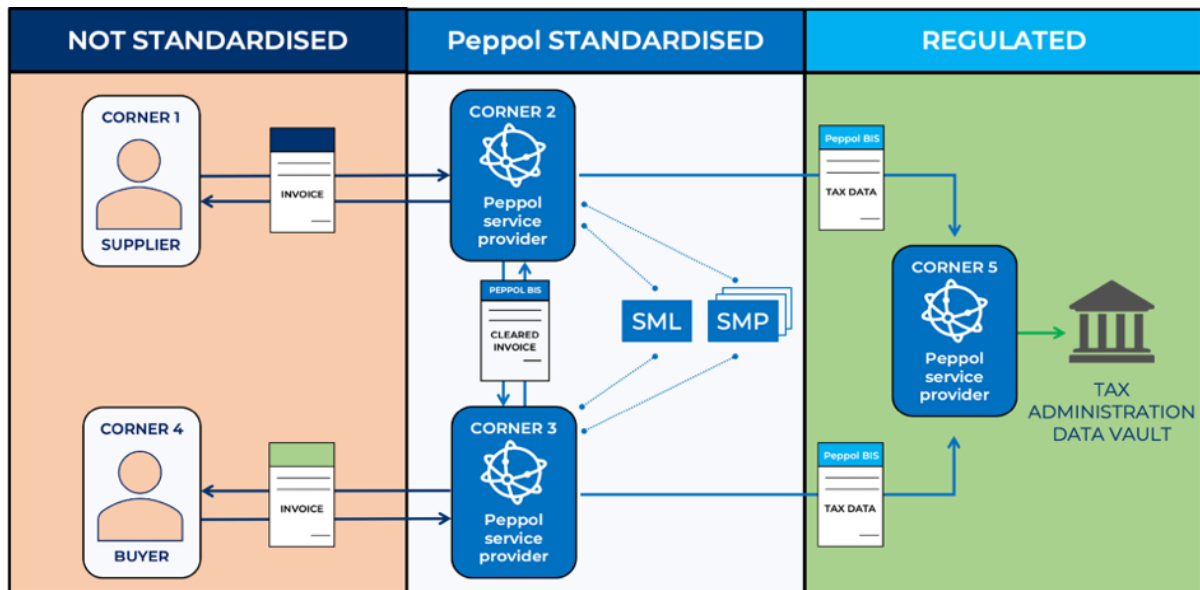
OpenPeppol has a community of members from the public and private sectors, comprising Peppol Authorities, service providers and end-users. The OpenPeppol membership increases continuously as the adoption of Peppol spreads around the world, with close to five hundred members from forty countries at the beginning of 2022.

Appendix D: Glossary of terms

Term	Definition
Business Document	A transaction document exchanged between trading parties such as invoice, purchase order, despatch advice
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)	In the context of this document, refers to the government-controlled central platform/infrastructure, which receives data from C2 and/or C3 CTC SPs for the purposes defined by the government or the relevant agency within defined controls
Corner 6 (C6)	The audit or financial control function and archive used by individual trading parties, C1 and C4
Clearance	Fiscal validation and approval before or after issue of the invoice to the buyer. Clearance may be provided by a central platform or through a network of accredited service providers
CTC	where transactional data is submitted electronically to the Tax Administration just before, during or shortly after the actual exchange of such data between the parties (including e-invoicing requirements). CTCs include real-time reporting mechanisms and the use of data extracted from (mandatory) e-invoicing processes– either with or without clearance
DRR	The term 'Digital Reporting Requirement' (DRR) covers various mechanisms that require taxpayers to report VAT data at transactional level to the Tax Administration. DRRs can be identified as CTCs and PTCs
Economic Operator	A business, other organisation, or person, which supplies goods or services.
Electronic Data Interchange (EDI)	is the computer-to-computer exchange of business documents in a standard electronic format between business partners.
Four and Five Corner Models	The four-corner model is used where the Sender and Receiver of a message are enrolled on different service provider platforms. Using interoperability schemes or agreements, the two service providers transmit or accept invoices on behalf of their customers emanating from the other service provider. A fifth corner may be added to a four-corner model, being a trusted destination commonly used by all parties in the network.
Interoperability	the ability of a seller or a buyer together acting as trading parties to exchange compliant e-invoices and other supply chain electronic messages containing the essential information elements required by both seller and buyer,

	irrespective of the information technology environment, back-office systems, or third-party solutions or services used by each.
Order-to-Cash	The process and supporting systems to automate the supply chain of activities from initial sale to receipt of payment (accounts receivable)
MNC	Multinational Corporation with a network of subsidiaries operating in different countries
PTC	Periodic Transaction Controls (PTCs), in which transactional data is reported to the Tax Administration at regular intervals. PTCs include VAT Listing and SAF-T systems, as well as residual paper reports
Purchase-to-pay	The process and supporting systems to automate the supply chain of activities from initial purchase to final payment (accounts payable)
SME	Small and Medium-sized Enterprise
Tax Administration (TA)	a government agency or department for the regulation and collection of indirect tax in a specific jurisdiction

Appendix E: Links to additional readings

European Commission: 'VAT in the Digital Age' (to be published)

OECD 'Guidance on Tax Compliance for Business and Accounting Software'

International Chamber of Commerce 'CTC Practice Principles'

The 'Global Interoperability Framework': www.gifworks.io

Billentis Report: The e-invoicing journey 2019-2025

Peppol CTC Reference Document https://peppol.eu/downloads/peppol-ctc/