THE E-INVOICING JOURNEY

Bruno Koch | Billentis

2019-2025

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Preparing Your Business for PDF and EDI Invoicing — Before It's Too Late

By Emmanuel Olivier, Esker Worldwide Chief Operating Officer

Managing EDI is now mandatory, but PDF remains a necessity

Until now, it has been possible for businesses to send and receive image-based PDF invoices by email (with or without e-signatures); however, with growing government legislations mandating structured electronic invoice exchange, PDFs are no longer sufficient. Businesses must generate and manage structured invoice data for all outbound and inbound invoices to remain compliant and to get paid.

Electronic Data Interchange (EDI), as its name infers, is the process by which data is exchanged between businesses in a commonly agreed electronic format. The main benefit of EDI technology is that it allows full automation with a smooth and secure exchange of messages between companies, making documents computer readable. This boosts efficiency, simplifies transactions and increases cost savings.

However, exchanging EDI-only files may not be suitable for all businesses. Small and medium businesses often struggle to manage EDI, whereas PDFs can easily be created from most ERP systems. Additionally, for companies of all sizes, invoice content must be available in a human readable format for AR and AP departments to validate it. It's not a one or the other situation — for businesses to be successful, they must do both EDI and PDF.

Finding the right partner from a legal, process and technical point of view is essential. Esker's strength lies in its ability to both generate an EDI file from a PDF and format an EDI file into a PDF for outbound/inbound transport modes. It can also process any EDI format to comply with international regulations.

EDI for B2B and B2G e-invoicing

The private sector was the main driver for initial market development of EDI due to its incredible efficiency. Big businesses were the first to encourage their partners to send or receive EDI invoices while today, governments are increasingly requiring it.

Some governments push EDI to digitise B2B exchanges and increase productivity. In Singapore and Australia, for example, the governments have adopted PEPPOL, a set of specifications enabling businesses to communicate electronically one common standard EDI format with public buyers and private businesses in various stages of the e-procurement process.

EDI-invoicing has even become a legislative obligation for tax control in some countries. Reducing the VAT gap is the main accelerator for the digitisation of business, fiscal, reporting, inventory, trade and logistical documents. Tax authorities mandate that businesses in a country exchange invoices in EDI format and encourage or even require the use of a real-time clearance model (invoices must be reported and authorised electronically by the tax administration before or during the exchange process). This ensures that tax administrations have full access to companies' invoice data, allowing them to monitor end-to-end business transactions.

These government-imposed invoicing obligations have driven many businesses to take the technological jump to EDI to comply with legislation or be left out of business exchanges.

A lesson from Italy

Italy was the first country in the European Union to legislate mandatory e-invoicing between private businesses using a clearance model regime. The regulation was put in place to not only prevent VAT fraud, but also to simplify administrative processes.

As of 1 January, 2019, businesses of any size must generate EDI invoices in a Fattura-PA format and submit them to the tax authority platform for delivery to their customers. They are also required to manage Fattura-PA invoices from their suppliers received via the tax authority platform. Businesses had to either find a partner to automate EDI-invoicing, manually key in invoices into a web portal, or build their own direct connection at their own expense. The sanctions for non-compliance result in heavy fines.

Taking Italy as an example, similar directives will soon become a reality in other countries. Businesses need to prepare for EDI now.

Esker, your e-invoicing partner

Esker strongly supports the global movement to standardise exchanges between the private and public sectors. Its unique platform supports e-invoicing compliance for supplier and customer invoices around the world.

Esker provides solutions to easily manage any input format (e.g., PDF, XML, any EDI format, etc.) and to generate any output expected format (e.g., PDF, XML or ERP specific format). Esker's solutions can extract data from a PDF file or an EDI file of any format (e.g., EDIFACT, ANSI, UBL, iDoc, XML, etc.), manage multi-formats, multi-channels, and deliver data formatting in the appropriate EDI format, as well as in a human readable PDF format. Esker provides secured exchanges via any communication transport (e.g., AS2, PEPPOL, SFTP, etc.), and interoperability with any platform from service providers and public administrations (e.g., Chorus, FACe, SDI, PEPPOL, etc.).

To further reinforce its commitment to worldwide interoperability, Esker is also a certified PEPPOL Access Point. Esker processes, sends and receives invoices to any recipient within the PEPPOL network and Esker's customers are thus deemed "PEPPOL ready".

In today's international context where each country has its own legislation, e-invoicing rules are becoming increasingly complex with various EDI formats. Esker has proficient technological and local market knowledge to adapt its solution to evolving legislative requirements.

0. Executive Summary

The global market is forecast to encompass 550 billion invoices annually. It is expected to quadruple in size by 2035. In 2019, only around 55 billion invoices are exchanged on a paperless basis. We estimate that the size of the global e-invoicing and enablement market in 2019 amounts to EUR 4.3 billion, and that it will reach approximately EUR 18 billion in 2025.

The private sector was the main driver for market development in the first phase; however, it is now being increasingly pushed by governments. The VAT gap is increasingly becoming the main accelerator for the digitisation of business, fiscal, reporting, inventory, trade and logistical documents.

The objective of significantly reducing the VAT gap cannot be achieved using models based on voluntary participation with incentives. Therefore, tax payers are increasingly required to use real-time clearance models. In this case, organisations have to exchange invoices via tax authorities, or to submit at least key invoice data in electronic format. This model may gradually achieve global adoption, and it is expected to become the dominant method worldwide for exchanging messages by 2025. It will eventually cover all kinds of fiscal documents such as invoices and related documentation. In particular, anonymous receipts and tickets will be enriched to an ever-greater degree with the authentication data of the customer at the point of sale or during purchase processes with mobile devices. They can hence also be transmitted to customers electronically, imported into AP systems and processed automatically.

Unfortunately, most clearance models grow from the bottom-up over several years. Moreover, the main aim is only to combat tax evasion. Most business processes are affected by this development. The final scenario is not communicated by the tax authorities, as they seem not to have a clear vision or five-year strategy. In practice, one business document after the other is gradually being digitised with data exchange via clearance models. Alternatively, a well-designed and implemented clearance model could instead form a keystone for a digital model country. The benefits for the economy could be factors higher with a long-term strategy adopted by the tax authorities.

A rapidly growing number of disruptive next-generation technologies lay a strong foundation as strategic drivers. They pave the way to substitute old solutions and processes by a completely new approach. A powerful market transition is taking place in our industry. This period of movement from one stage to another creates new opportunities for innovative and forward-thinking companies, which are ready to take advantage of this shift.

The invoice processing with its' high proportion of repetitive and rule based work is a key topic to be affected by the market transition ahead of us. This phase can mean an opportunity or a threat. Emerging technologies like blockchain, cloud aggregation platforms, robotic process automation, machine learning and advanced analytics may pave the way to improve the degree of business process automation and exploit the full potential for savings.

The digital transformation is no longer an option, it's the imperative. It is rather the question how to unleash the power of the digitalisation while maintaining a healthy business.

For businesses and public-sector organisations, we see a need to change from a reactive to a proactive approach. This helps to avoid a heterogeneous solution, channel, format and process landscape. We recommend defining a holistic business process automation strategy as soon as possible. Reading this report can be a good start.

1. Introduction

1.1 The purpose of the Report

E-invoicing/e-billing is a rapidly expanding technology. Whereas Latin American and many European and Asian countries are already considerably advanced in this field, a vast majority of organisations have not yet decided upon one system or service.

A high number of providers offer solutions and services for this matter. In this phase, it is important to have up-to-date information and guidance on selecting the right solution and provider.

An independent international e-invoicing consultant and market analyst has written this report. Its purpose is to support invoice issuers and recipients wishing to replace expensive paper-based invoice management. It gives relevant information for succeeding with an e-invoicing project. The report not only provides facts, but also qualitative views, evaluation and details about the products offered by many providers.

1.2 Methodology

The author has worked in the e-invoicing business since 1997. During the first two years in Switzerland, he established one of the first e-billing/e-invoicing cloud services in Europe. Since 1999, he has acted as an independent consultant and has made business plans, RFPs, system evaluations and many technical and marketing concepts for large invoice issuers and recipients, governments, integrators, solution and service providers. During this time, he has constantly collected important data about the relevant markets. The results are repeatedly published in newsletters and market reports.

The report is based on

- Publicly available information; we gathered information from thousands of sources over the years and adjusted them
    - Official statistics in particular from countries with clearance models, knowing these figures accurately
    - Country and industry specific user surveys
    - Figures from large invoice issuers & recipients (e.g. telecom, utilities, card issuers, public sector, health services, retail industry), published online or in corporate responsibility reports
    - Figures of leading service providers
    - Consolidated figures of industry associations
    - Market research carried out by third parties (representing 20,000+ enterprises and 15,000+ consumers)
- Verification of important figures by customers/providers and analysis of dozens of corporate responsibility reports, normally providing an evidence for paperless proportion of bills and invoices
- Numerous interviews with local experts
- Own in-depth experience from more than 200 customer consulting projects in 50+ countries
- Consolidation of the above information

1.3 Terms and definitions

The term ‘e-invoice’ is used for the Business-to-Business (B2B) and Business-to-Government (B2G/G2B) segment. It includes exclusively the electronic invoice exchange between suppliers and buyers, but does not consider the data exchange between suppliers/buyers and tax authorities for reporting and control purposes. The legislation in EU countries considers a relatively broad definition for the B2B segment: The issuing and receipt of VAT compliant invoices in an electronic format. Most national legislation mandates users to archive the e-invoices in its original

(electronic) format, even if it were printed after receipt. This definition in Europe corresponds with the broad recognition by users and includes image-based digital invoices (mainly PDFs). For B2G, just structured messages are considered as e-invoices.

Definitions in other regions of the world differ greatly. Although, in any case, it is not valid, for others e-invoicing means much more than simply 'automated invoicing'. In this report, 'e-invoicing' is used in the narrow legal sense as described below. Terms like 'touchless e-invoicing', 'zero touch e-invoicing' or 'true e-invoicing' are used in the event of structured e-invoices.

Figure 1: Definition of e-invoice in a global context

Not considered as e-invoices:

Fiscal documents not representing a commercial transaction followed by 'demand for payment', e.g. bank statements, waybills

Fully digital invoices that are not tax-compliant due to lack of integrity, authenticity and legibility

'Electronic invoices' that are supported by legally relevant paper summary invoices (parts of the EDI world), scanned or printed/archived by recipients (if just the paper version is stored as the 'new' de-facto original).

'Asymmetric e-invoice', buyers can demand a printed invoice and consider it as the legal original invoice.

Major bulk of paper invoices, even if in parallel some invoice data are transmitted to the tax authorities or trading partner.

E-invoices in the broader legal sense:

'Simplified low value' e-invoices with reduced content requirements (often just 4-8 mandatory data fields) and without customer authentication; customers can sometimes get them electronically by using the transaction code on the receipt

Legally can this category include invoices in a broader sense.

E-invoices in the narrow legal sense:

E-invoices with full content (including at least 8-16 mandatory fields) and authentication of the issuer & recipient.

Two organisations in the role as supplier and buyer exchange a digital and tax-compliant invoice as the valid original invoice. They exchange them directly, via service providers and/or via the platform provided by tax authorities. These e-invoices are preserved. They are the only relevant original invoices for the tax authorities and auditors.

Paper representations can be found, but will never be considered as the legal original versions.

In this report, 'e-billing' covers the electronic bills from Business-to-Consumers (B2C) and Government-to-Consumer (G2C).
Note: Some market participants use this term alternatively for the process on the issuer side in general, regardless of whether the customer is an enterprise or household.

2. The market

2.1 Global market volume and value

2.1.1 Volume of invoices and invoice-like documents

2.1.1.1 Bills/Invoices

While the volume of (paper and electronic) bills and invoices in Europe and Latin America has been relatively well-known for many years, figures for other continents were simply calculated on the basis of key metrics from Europe and Latin America. New data from reliable sources for China now enable the figures for 2017 to be replaced by more accurate estimates.

Figure 2: Estimate for global bill/invoice volume 2019

Segment	Estimated annual volume to be at least
B2C/G2C	270 billion
B2B/B2G/G2B	280 billion
Total	**550 billion**

Source: Billentis

Indicatively, roughly half of this volume of bills and invoices is currently issued for services and the other half for physical goods.

2.1.1.2 Invoice-like documents and messages

Additional volume of invoices in the broader legal sense and 'invoice-like documents and messages' can also be tremendous (depending on country likely **5 to 15 times over the invoice volume**). Invoices are different from receipts (payslips, tickets). Both invoices and receipts are ways of tracking purchases of goods and services. In general, the content of the invoices can be similar to that of receipts including tracking the amount of the sale, calculating sales tax owed and calculating any discounts applied to the purchase. Classical examples of these 'invoice-like documents and messages' are

- Invoice data sent to the tax authorities just for validation or audit reasons, e-reporting, VAT statements
- Digital replacements of 'fiscal printers producing payment receipts'. Electronic (payment) receipts, generated by tills at the Points of Sale (POS, shops, restaurants, ticket counters) and sent to the tax authorities just for validation or audit reasons (e.g. in Taiwan and some Latin American countries); more accurate translations to English use the terms 'electronic tax receipts' or 'uniform invoices' for these messages.

2.1.2 Why the global invoice market is expected to quadruple in size

Billentis uses the terms 'invoice'/'bill' and 'e-invoice'/'e-bill' in a manner that facilitates the global comparison of statistics and predictions. In some countries, the legal definitions can vary slightly. However, almost all definitions provide for full-content invoices on the one hand and low-value invoices with reduced content requirements on the other hand.

Figure 3: Bills and invoices in the narrow and broad legal sense

Invoices in the narrow legal sense:	**Invoices in the broader legal sense:**
Bills/invoices with full content (including at least 8-16 mandatory fields) and authentication of the issuer & recipient. Typically issued by accounting/ERP systems. Basis for electronic transmission and automated processing.	'Simplified low value' bills/invoices with reduced content requirements (often just 4-8 mandatory data fields) and without customer authentication. Classical examples are payment receipts, tickets for train, flight or cinema etc. Typically anonymously issued by cash registers at the Point of Sale (POS). In some cases, customers can get the electronic data on portals after keying-in the transaction code. Not appropriate for automated, electronic transfer to customer and automated processing.

On average globally, around 70 bills/invoices in the narrow legal sense are currently exchanged per person per year. The key metrics for various regions of the world differ considerably. Some advanced economies in central Europe and Mexico achieve a value of 100, whereas the figure for Africa is just over 30. Local experts [1] have come to the conclusion that China achieves a key metric of almost 150 per person per year. Why is the density of invoices in this country much higher than in the rest of the world? One explanation refers to a legal requirement for an upper limit of amounts in a single invoice. For this reason, many invoices in China have to be split into several child invoices. Another reason may be the relatively advanced electronic POS and mobile invoicing.

Today, customers in most countries can easily purchase goods or services at the POS without any formalities. As payment confirmation, they receive a receipt which does not include the customer name. Electronic data transfer to the customer is not easy and automated processing is either difficult or impossible.

In the event that the purchase exceeds a value of several hundred euros, most jurisdictions require an authentication of the customer, and their data is included in the payment confirmation. The receipt is enriched with customer master data and upgraded to a standard invoice.

A decade ago, customers in some innovative countries such as Chile already received a financial incentive (for example, a more favourable VAT rate) when they identified themselves at the POS on a voluntary basis.

The author expects anonymous POS purchases to be subject to increasing restrictions by authorities with the aim of combating tax evasion. This could be implemented by reducing the upper limit for anonymous purchases in legislation. Another driver may be mobile technology, which easily permits the authentication of merchants and customers. There are already clear indications that a significant proportion of the invoices in a broader legal sense will become full-content invoices; this development increases the possibility of exchanging these invoices electronically and processing them automatically.

Hitherto anonymous receipts and tickets will increasingly be enriched with the authentication data of the customer at the POS or during purchase processes with mobile devices. They can hence also be transmitted to customers electronically, imported into the AP systems and processed automatically. Combined with organic annual growth of about 3%, the volume of invoices in the narrow legal sense is expected to quadruple by 2035.

2.2 Evolving market models

2.2.1 Overview

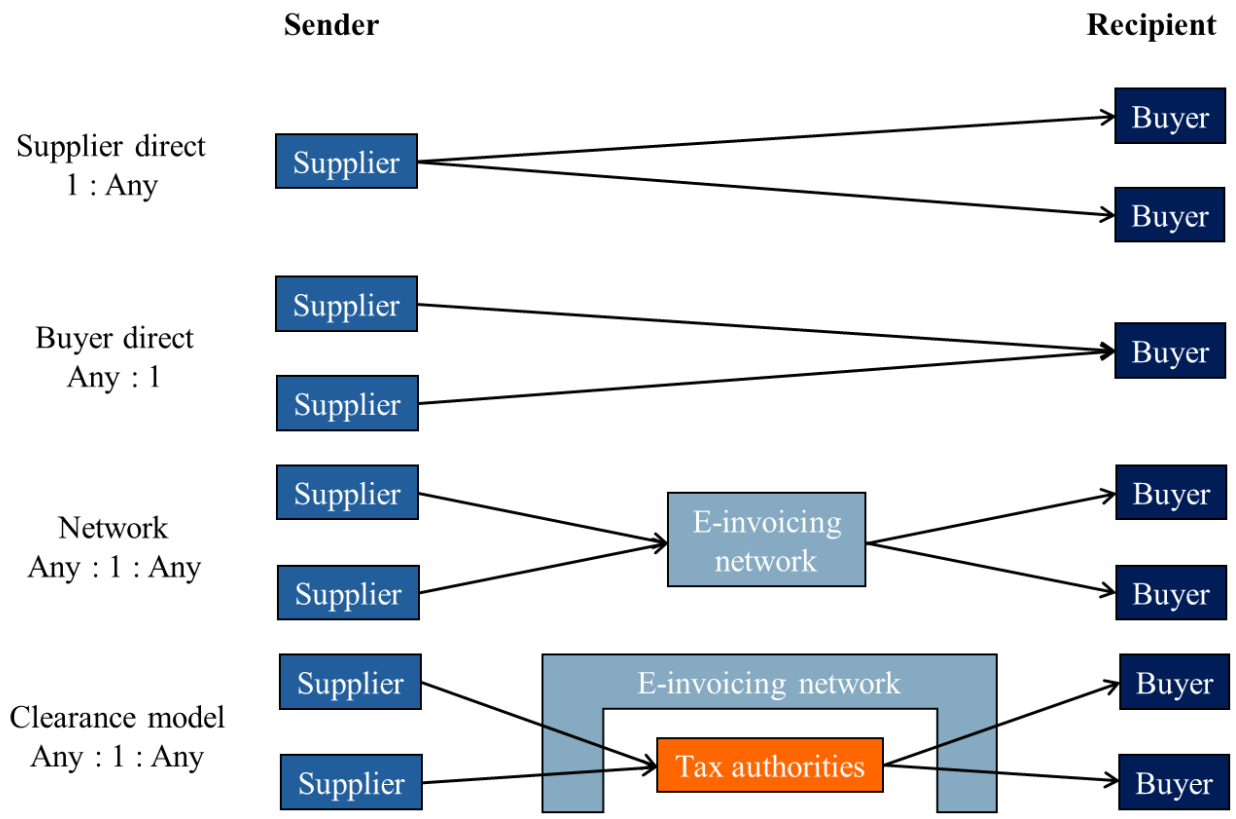
Many large organisations intend to exchange electronic business messages directly with their counterparts. This is still a good approach in the case of stable partnerships with very large trading parties and if the legal requirements for these messages are not very high.

The invoice can be seen as the 'queen of documents/messages'. In most countries, it is THE document regarding VAT reclaim, for tax reasons and auditing. If paper based invoices are replaced by electronic invoices, it is essential to stay VAT compliant. Even if very large organisations prefer to exchange electronic invoices directly with their counterparts, the vast majority of companies are advised to use a professional third party service.

We distinguish between several e-invoicing models:

- Supplier direct model (in-house)
- Buyer direct model (in-house)
- Outsourced direct model: Software as a Service (SaaS), Platform as a Service (PaaS)
- Network model, third party operator service
- Hybrid cloud models
- Clearance model

Figure 4: Overview about main market models



2.2.2 Supplier direct model

A supplier implements an e-billing/e-invoicing solution within his environment for distributing the electronic invoices via different channels:

- Sends them to the customers via email, SMS, Apps etc.

- Provides the e-invoices on his customer portal; Customers can login, view and download them

The supplier direct model is quite popular in high-volume industries like telecommunications, utility and card companies, as well as online shopping portals. Small businesses also have a preference to exchange e-invoices directly with their trading partners. Due to their size, they do not have the capacity to provide e-invoices on their own portals, but instead exchange them as PDF invoices attached to emails.

2.2.3 Buyer direct model

A buyer implements an e-invoicing and/or invoice management solution within his environment for receiving the electronic invoices via different channels:

- Gets invoices directly as a data stream for importing them into his AP solution (preferred mainly for invoices of large suppliers)
- Smaller suppliers key-in the invoice data in a web-template on the corporate invoice portal of the buyer (webEDI); data can be automatically processed and imported into the AP system

This model is preferred by larger organisations with a limited number of suppliers.
The model can also be quite successful with smaller suppliers if orders are sent to them in electronic form alone (e.g. via extranet portal). Many solution providers offer a functionality to convert these purchase order data easily into an invoice for sending back to the buyer.

2.2.4 Direct model as a service

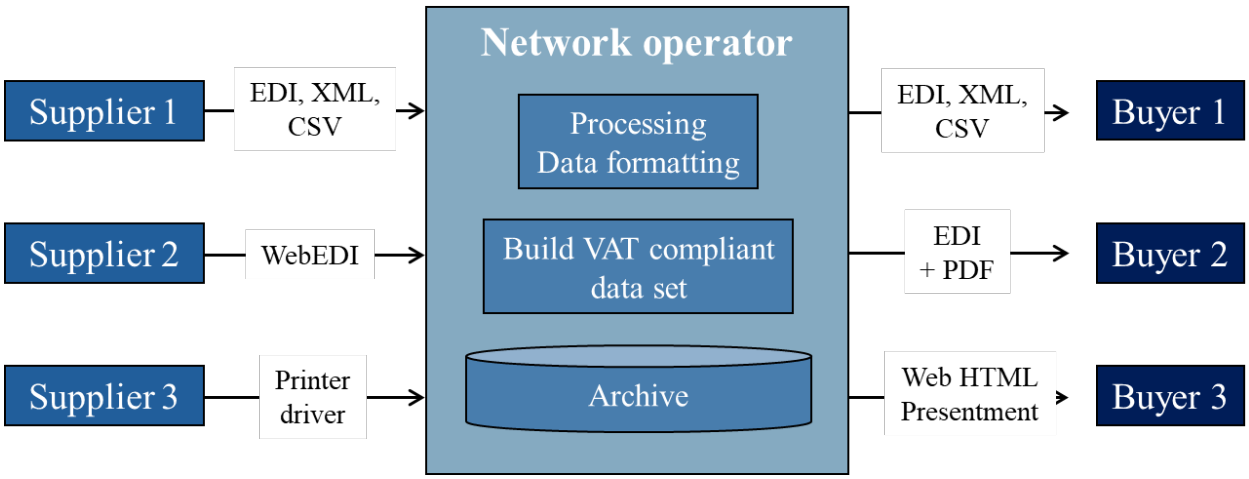
Over the years, large organisations using biller or buyer direct models concluded that the marketing rollout is harder than expected and that the maintenance of their applications is ultimately too expensive. That is why some service providers offer white-label services for them (SaaS, Software as a Service, PaaS, Platform as a Service). They run a direct model on behalf of large issuers and recipients of invoices. These providers typically develop, maintain and operate the software. Customers pay just a fixed integration fee and a volume/time based fee.

2.2.5 Network model

Issuer and recipient have just one interface to their service provider, the network operator[1]. This e-invoicing network operator manages the VAT compliant invoice transfer to clients. Issuers can deliver invoice data (e.g. ERP output format, any XML data or a flat file) to the operator who translates it into the target format of the recipient. The operator supports the main legal requirements, authenticity and the end-to-end data integrity. An increasing number of operators offer additional services such as tax compliant long-term archiving.

[1] In some countries, the terms ‘consolidator’, ‘service provider’, ‘e-Commerce network’, ‘B2B network’, ‘e-invoice cloud’, ‘B2B cloud’ or ‘supplier network’ are more common.

Figure 5: Network model



Large issuers and recipients intend to make a full integration into their AR and AP applications. SMEs often prefer easier and quicker solutions, either by using WebEDI or printer drivers. For both channels, suppliers' AR systems do not need any modification or upgrade. Use of e-invoicing is possible for them within hours after making their decision.

As the three parties supplier, buyer and network operators are part, this is also known as three corner model.

2.2.6 Four corner, multi-cloud and hybrid cloud model

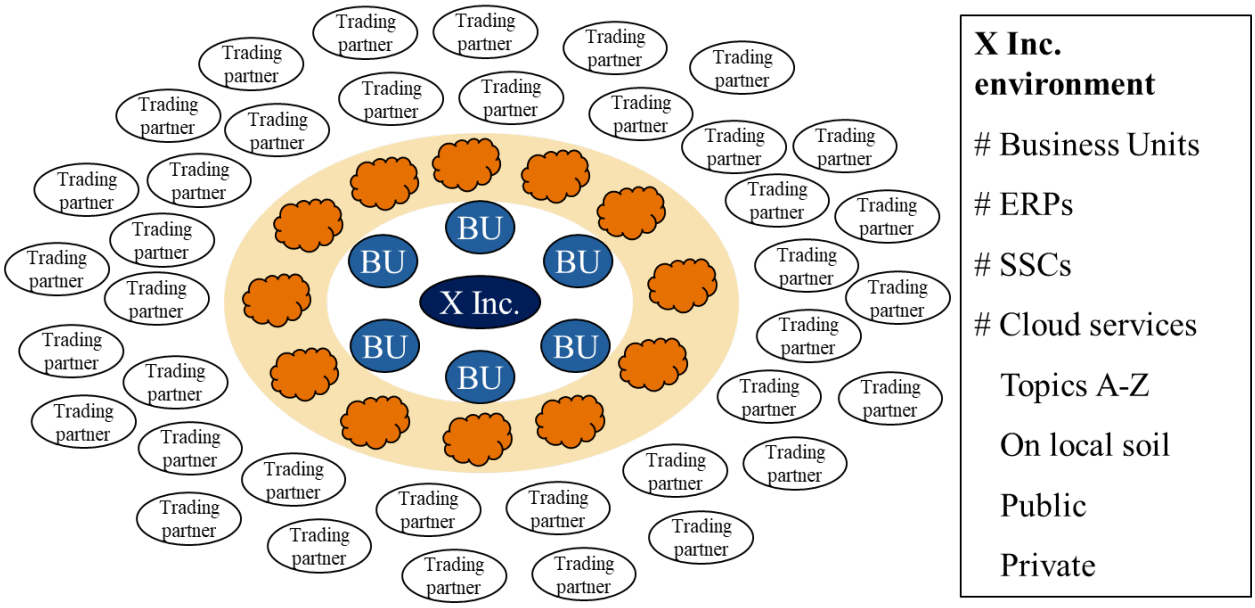
2.2.6.1 Four corner model

Meanwhile, even in smaller industrialised countries, more than 50 service providers are offering cloud-based e-invoicing services. The probability that suppliers and buyers are using different network operators is very high. In order to exchange electronic documents across heterogeneous platforms, different service providers must connect their networks and exchange data in an interoperable manner. In the past, interoperability approaches were often proprietary. In the meantime, associations around the world are advancing more standardised and harmonised interoperability frameworks. Associations with the aim of improving interoperability at an international level include ConnectONCE, EESPA, GS1 and OpenPEPPOL. Regional organisations such as the U.S. Business Payments Coalition, the A-NZ Digital Business Council and others are also aligning their models with the evolving international frameworks. This increases the likelihood that trading parties using different cloud operators are able to exchange e-invoices and other business messages using a single interface.

2.2.6.2 Multi-cloud

Organisations can now use different cloud services from various sources, such as ERP services, archiving, e-reporting of fiscal information and cloud infrastructures to exchange business messages. Organisations benefit from these cloud services by utilising and paying for this infrastructure as and when it is required. End-users are realising that they should not re-invent everything independently. Instead, they can deploy field-tested solutions and cloud services.

Figure 6: Example of an organically grown cloud environment in a multinational business



This process often starts with just two or three cloud services at the company headquarters, in particular for the exchange of e-invoices and other B2B documents. Business units do not typically have many strategic constraints from their headquarters and are able to commission additional cloud services. This quickly results in a heterogeneous multi-cloud environment. Synchronisation between the various cloud services does not usually occur. Parallel processes as well as data and archive silos are common. Besides operational issues, tax compliance and change management represent a major challenge.

2.2.6.3 Hybrid cloud

The hybrid cloud refers to a composition of several cloud services that remain distinct entities but, unlike the multi-cloud model, are bound together. This can take the form of a cloud aggregation platform (CAP) or the services of an external cloud service broker (CSB).

A CSB aggregates cloud services from various sources and creates a new combined service for the customer [2].

Modular cloud components and open cloud services can already be found on the market, including:

- E-invoice exchange
- Any-to-any data formatting for at least the most common formats
- Mapping setups for data formatting and roaming, either provided as a cloud service, or by a shared service centre or independent cloud workers
- Tax compliance services
    - Validation services regarding tax-compliant master data of issuer and recipient; lookup routines with public and private directories for businesses and public administrations
    - Validation services for other legally required invoice content
    - Ensuring and/or validating the formal compliance of invoices and other business documents
    - Long-term archiving
- Synchronisation services for master and product data
- Software robots for specific tasks
- ERP in the cloud

- ERP connectivity services
- Country localisation services
- Tax reporting
- Virtual servers and data centres
- Open-source cloud computing services
- Web services
- Data base
- Data extraction
- Analytics, including spend management
- Payment and supply chain financing
- Procurement
- Trade facilitation

The development of CSBs is still in its early stages, but it may have the momentum to disrupt conventional models. By using these services, organisations will have the ability to become more flexible in the future.

Gartner et al identify three areas within which cloud service brokers operate.

Figure 7: Areas of activity for cloud services brokers

Area	Description
Aggregation	Management and administration tasks, including provisioning, user access and authentication, monitoring SLAs etc. for different cloud services, which are provided by multiple cloud service operators; providers also develop a unified interface for all these services.
Integration	Integration ensures that the different cloud services communicate and work properly with each other.
Customisation	System configuration to meet the requirements of the specific operating environment.

We anticipate new opportunities for B2B cloud operators. Firstly, they may substantially improve their cost structure and flexibility using modular cloud components. Another opportunity might arise if they offer components or the entire cloud service to current cloud service brokers. Lastly, they could enhance their existing portfolio with further cloud components and become cloud service brokers themselves.

2.3 Global adoption seems inevitable for electronic POS and mobile invoicing

We are all familiar with the traditional model. At the POS, the merchant calculates the amount owed by the customer and creates a simplified invoice. In the worst case, this is still printed out by a cash register. The POS terminal software lists the purchased articles and the printout already contains most of the information provided in full-content invoices, excluding the master data of the customer. For the following payment process, we are used to having several options. It can result in a paper-based low-value invoice, a payment receipt or a combined printout. In the case of a B2B transaction, the customer has to input the expense data into their accounting system.

Meanwhile, the market is ready for significant innovation and the required components are already in operation in some instances:

- Cash registers are connected to a payment clearing centre and, in some cases, also to the tax authorities and/or private e-invoice exchange networks and email systems
- Most customers have mobile devices with apps, supporting
    - Customer and merchant authentication via QR code (master data stored in the app settings or in a central portal) and/or digital certificate
    - Mobile payment options

The customer (a business or consumer) installs an app. In the settings, they enter their master data and addressing/routing information for exchanging the e-invoice. When shopping in stores, the customer authenticates themselves in advance or while at the retail checkout. In other cases, such as at restaurants or for 'over the counter' purchases, they identify themselves with the QR code on the mobile device before ordering. The customer receives the electronic invoice and can confirm for instant online payment. Through the channel defined in the settings, the customer also obtains a structured invoice for importing to AP systems and automated processing.

This also works the same in the event that a customer uses the app to purchase tickets for trains, flights or cinema viewings or to engage in other forms of online shopping.

All the necessary components are already operational somewhere, in particular south-east Asia including China and a number of advanced Latin American countries. This model may also be adopted in advanced economies. Solution providers of leading payment apps, independent payment service providers with a strong position in the card issuing and/or acquiring business as clearance entities, B2B and B2C invoice exchange network operators, tax authorities with clearance servers or inter-banking organisations are in an excellent position to exploit this highly interesting market potential.

2.4 Tax driven clearance model as key-stone for the digital model country

2.4.1 VAT gap as main accelerator for the digitalisation of all fiscal documents

The private industry was the main driver for the market development in phase one; however, it is now being increasingly supported by the governments. The VAT gap becomes more and more the main accelerator for the digitalisation of any business, fiscal, reporting, inventory, trade, and logistic documents.

To understand the development of e-invoicing in general, and the influence of the governments in particular, it may be helpful to understand the impact of the VAT gap.

Globally, the VAT Gap may be 20-30% of the public revenue, or half a trillion EUR p.a. [3]. The fight of tax authorities against this VAT gap has become a major trigger for the digitalisation of most business and tax processes. Before going into details, it is crucial to understand the areas where the VAT gap may occur, and the digital vehicles with the potential to reduce this gap.

Figure 8: Some causes of VAT/income tax gap and the digital vehicles to reduce it

Area / Cause	Digital vehicle
Cash payments without receipts and tax declaration	Require non-cash payments above a certain amount and/or withdraw banknotes from circulation if they exceed a certain amount. Require certified cash registers that are linked to the tax authorities to submit real-time reporting.

Area / Cause	Digital vehicle
	Encourage or require customers to demand receipts / invoices. Electronic POS and mobile invoicing via clearance model.
Carousel fraud and invoicing between phantom partners, or involved parties winding up before tax audit	Require e-invoicing. Require real-time lookup routines to make sure that all trading parties are registered in the national business directory. Apply the clearance model.
Invoicing using wrong amounts	Require e-invoicing via clearance model. Artificial intelligence to detect wrong amounts.
Goods are not supplied after an invoice has been issued	For physical supplies: Digital link between the virtual and physical world; transport documents shall be valid only with evidence that transported goods have been declared with the tax authorities. Digital inventory reporting between businesses and tax authorities.
Undeclared supplies and barter transactions	Artificial intelligence; match between invoices, labour costs and inventory
Smuggling and domestic fraud with physical supplies	E-customs; digital trade facilitation; digital link between the virtual and physical world.
Fictive employees and wrong labour costs	Require electronic salary statements, which are exchanged using the clearance model.

2.4.2 Electronic reporting of invoice data and other fiscal information

Governments' revenue departments combat tax evasion wherever they can. They seek to gather vast amounts of data regarding all relevant issues – following the concept of Big Data. Today, the status quo in all countries is to collect at least general ledgers and other audit data. In most countries, this is still only required periodically, after transactions have already occurred, and paper-based reporting is in most cases still permitted. This likely has no real influence on reducing tax evasion. Big Data may become the new gold to combat the tax evasion.

Considering all fiscal documents, it is the invoice which provides the most complete information for tax authorities. Invoices are therefore moved to the foreground as part of a next transformation step. In this phase, tax authorities mandate the organisations in a country to exchange invoices in electronic format only. The invoice data also have to be sent to the tax authorities (clearance model) before or after the shipment of goods. E-audit and data forensics help the tax authorities to detect anomalies sooner. As we see in a number of countries, these steps significantly facilitate a reduction in tax evasion.

Nevertheless, tax evasion is still possible, for instance, if goods are sold over the counter, or if paid salaries are declared wrongly or not declared at all etc. Consequently, countries that in particular exhibit a level of tax evasion above the international average are currently attempting to completely close the electronic loop between tax payers and the tax authorities. All data of fiscal relevance will be reported to the tax authorities electronically in the future. Real-time or near real-time audits will become a matter of course.

This concerns several fiscal documents, which are increasingly required to be exchanged with tax authorities, trading partners and employees in an electronic format only, including:

- Invoice extracts
- Full content invoices
- POS and mobile invoices
- Corrections, cancellations
- Credit/debit notes
- Financing
- Payments
- Purchasing, procurement
- Human Resource, salary statements
- Transport and logistics
- Inventory
- Export/import, trade facilitation documents
- VAT declaration and deduction
- Bank statements
- …

As the electronic gaps from the taxation perspective will be closed, tax declarations, deductions, reclaims and the traditional audits will no longer be required in the future.

The results for the tax authorities are remarkable:

- Brazil has seen a $ 58 billion (USD) increase in tax revenue as a result of plugging gaps in invoicing and reporting.
- Chile and Mexico reduced the VAT gap up to 50% [4].
- Colombia found that it could reduce 50% of the country's tax evasion by applying these forms of models.

To achieve this, it is necessary to completely disrupt the conventional paper-based models. Not all countries have this capability or the political support for the strict replacement of traditional models.

Most countries in Latin America, as well as some countries in Asia are forerunners with respect to the digital reporting model. Southern and Eastern European countries are now following this trend, although they use different models. Spain is one of the countries that require reporting of invoice data not only from suppliers, but also from buyers.

2.4.3 Digital link between virtual and physical world

Documents and information related to the transport, delivery, customs, and even manufacturing of goods are directly related to the fiscal documents as mentioned in the chapter above. Therefore, are they expected to become a mandatory part of electronic reporting in the future.

In many countries, solutions already exist; however, most of them work with just a fraction of data, or they are isolated systems that do not match information between the virtual and the physical world.

In the **EU**, the Excise Movement and Control System (EMCS) is in place. Under EU legislation, excise duties are paid on alcohol, tobacco and energy products at the final point of consumption. While in transit to their final destination, these goods are in duty-suspension i.e. no excise duty has yet been paid on them. The EMCS provides Member States with an electronic system to

monitor the movement of these goods in real-time, in order to ensure that the duties are properly levied at the final destination. [5]

Brazil is already quite advanced. The tax authority requires that invoices are issued before goods are shipped. Brazilian tax authorities send the signed invoice / bill of lading back to the supplier, and ensure that goods are supplied following invoicing. In addition, the system Brasil-ID [6] allows tracking goods on certain corridors, based on the RFID technology.

Hungary operates the Electronic Trade and Transport Control System EKAER [7]. The system is designed to minimize the possibility of VAT fraud, and has been in place since 2015. It monitors transport of goods inside Hungary, and also goods transported on public roads between member states of the European Union. Hungary is also making a big step forward regarding electronic reporting of invoices. Hence, the tax authority will eventually have real-time data about the virtual and physical world.

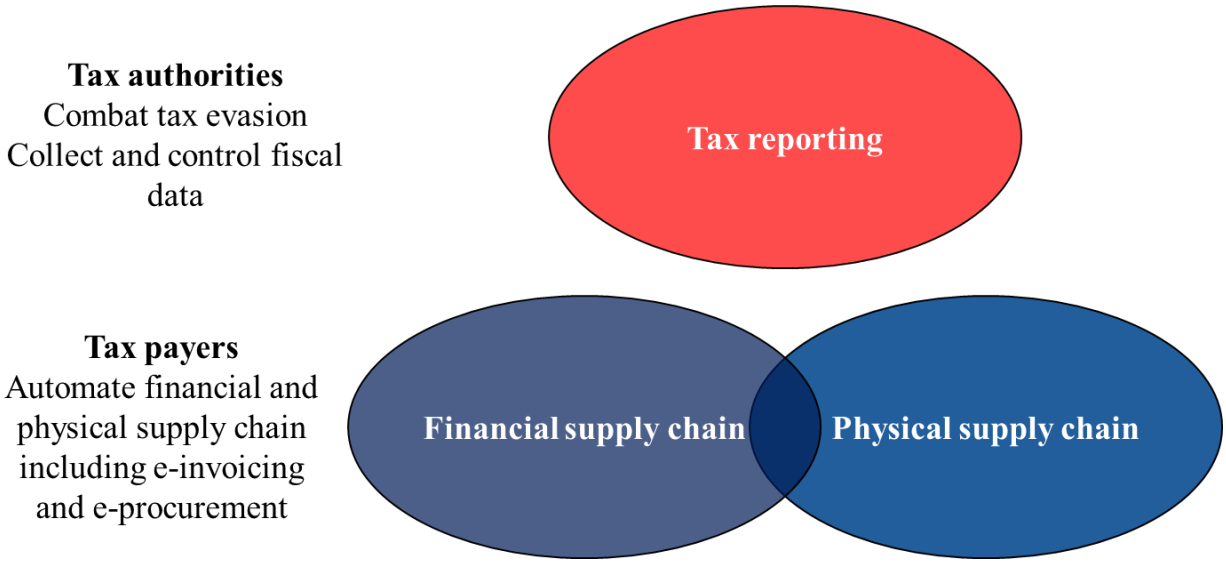
An interesting example of a digital link between the virtual and the physical world is **Kazakhstan**. Institutional reforms of the President of Kazakhstan have resulted in a long list of step-by-step implementation action plan. One part of it builds the clearance system for many fiscal documents, including e-invoices. Since the beginning of 2019, all VAT payers and importers are required to exchange invoices only electronically. In addition, a Virtual Warehouse Module was developed for automatic end-to-end monitoring of goods from the moment of their import into the Republic of Kazakhstan, or their production on the RK territory, to the moment they are sold. The virtual warehouse also makes it possible to track the process of pricing at each stage of goods movement, from production or import to sale. The e-invoice transmission requires mechanisms of cross-border e-invoice exchange, in transactions with Eurasian Economic Union member countries and with other states. [8]

From January 2020, **Russia** will require the tracking and tracing of all pharmaceuticals circulating in the country. This will involve all parties in the supply chain: pharmaceutical manufacturers, importers, transport and logistics companies, distributors and dispensers. Products must be accounted for at every step of their journey – from production to provision. The interactions have to be carried out in near-real-time using signed XML files. In contrast to many other countries, the aim here is not related to tax evasion or optimisation, but rather to combat counterfeit products.

2.4.4 Harmonised digitalisation of tax reporting, financial and physical supply chain

Historically, the automation of business processes and tax reporting has evolved somewhat independently.

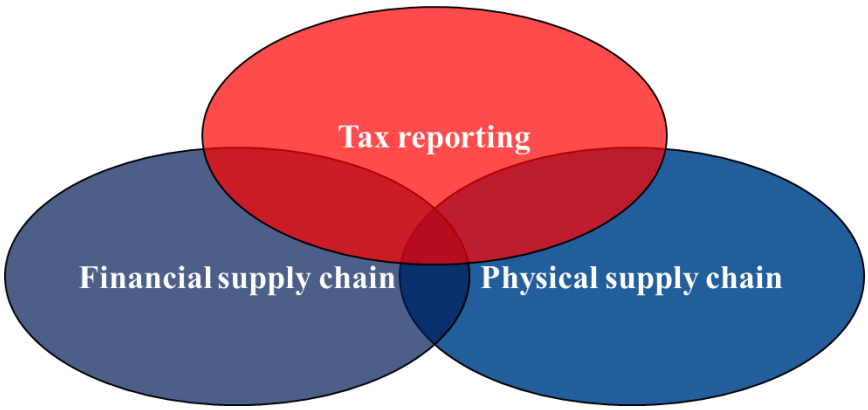
Figure 9: Objectives of tax authorities and tax payers



In the worst case, the three topics form isolated processes and data silos. In practice, private industry has advanced the automation of the financial and physical supply chain – at least to some extent. To this end, suppliers and buyers exchange up to 160 electronic business messages.

Mainly tax authorities in Asian and Latin American countries, but also increasingly Europe, are requiring electronic data comparable to the business communications exchanged between suppliers and buyers.

Figure 10: Related topics may no longer be treated in isolation



The overlap between the three topics is steadily increasing. Due to their evolution over time, processes and messages among both trading parties and tax authorities are still executed in parallel. Harmonised digitalisation is only possible if suppliers, buyers and tax authorities collaborate to design and implement an appropriate model.

2.4.5 From the pure clearance model to the digital model country

At least in the countries with VAT systems, an invoice is a key document to provide evidence for tax compliance. For historical reasons, most of these countries still practice the post-audit model,

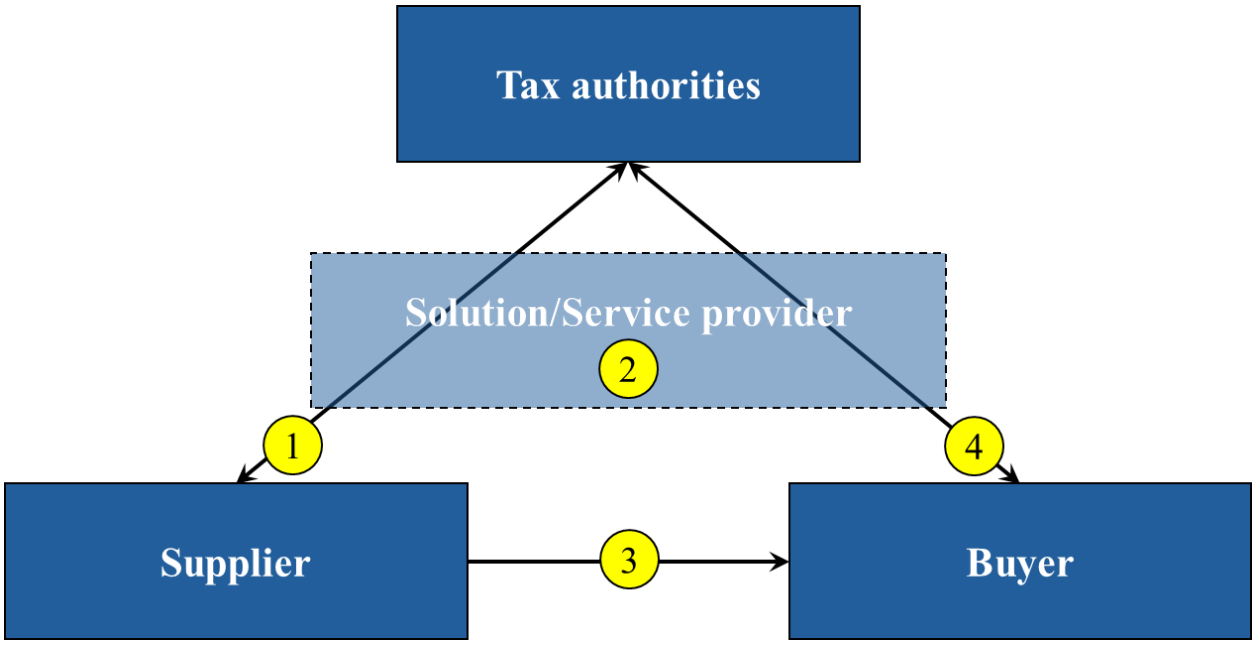
which means that tax audits happen years after the business transactions have taken place. This model has many disadvantages for taxpayers and tax authorities. It is also one major reason for tax evasion. This post-audit model is no longer up-to-date. Hence, we see a rapid change towards real-time or at least near-time clearance models. In this case, organisations are required to exchange invoices via tax authorities, or to submit at least key invoice data in electronic format. Latin American, Asian and some European countries with the largest tax collection challenges implemented the clearance model first. The model might gradually conquer the world, and it is expected to be the dominant control method globally from 2025 [9]. It is already affecting most businesses operating internationally. The model might become the norm, but, unfortunately, not all countries will implement it in the same form.

Although invoice-relevant data can be exchanged using the same technical platforms, and following the same schemes and models, it is useful to distinguish between e-invoicing and e-reporting to tax authorities. Mainly in Asian publications, e-reporting from cash registers and virtual printers to tax authorities is often translated into English using the term 'e-invoicing'. However, we use the term differently in this document.

Figure 11: Distinguishing between electronic invoicing and tax reporting

E-invoicing	**E-reporting to tax authorities**
Both the supplier **and** the buyer have finally an electronic invoice that represents for tax purposes the **invoice original**. These invoices include the full content. In practice, it may be one document, or several documents, one of which contains all the core information relevant for tax purposes, with separate extensions that are more relevant to suppliers and buyers.	E-reporting includes reports of business transactions, extracts of invoices, declarations of any other fiscal data, and VAT records. It is devised to speed up processing of VAT statements and returns. In one application example, only the supplier has finally an electronic invoice, but sends the original invoice in paper form to the buyer. In another scenario, the parties exchange just an extract of the invoice electronically (which is suitable for reporting and tax audit purposes).

Figure 12: General principles of the clearance model



Item	Forms/Description
1	E-invoicing: In many countries, the tax authority issues invoice numbers ('folio') that must be used by suppliers. After creation, suppliers in some countries are required to provide full invoice data to the tax authorities and directly or indirectly to the buyers; a few tax authorities require these data already before supplies are shipped. The tax authority or accredited service providers validate the data and return them with electronic approval codes to the suppliers. E-reporting: Some countries require only invoice extracts in any format, or as Standard Audit File (SAF-T). Besides invoice data, suppliers must report other data of fiscal relevance. Until today, clearance models have been addressing mainly, but not only, the suppliers (asymmetric clearance model).
2	Most countries with clearance models require the use of certified software respectively accredited service providers for the data exchange between tax payers and tax authorities. These service providers format the data if necessary, and validate the tax relevant content and the identity of trading parties. They usually also provide buyers with e-invoices.
3	E-invoicing: As the supplier is required to produce structured invoice data for the tax authorities anyway, he is also able to provide these data in the appropriate format (structured and/or as PDF) directly to the buyer or does so via service providers.
4	Today, suppliers and buyers in some countries with clearance models still exchange invoices in paper form. Nevertheless, the probability that the invoices are also exchanged electronically is high (80%). Regardless of the invoice format, buyers are responsible for cross-checking invoice data against data reported by suppliers to tax authorities. Depending on country regulations, they may also be required to confirm receipt. Some countries offer incentives to do this voluntarily. Buyers are obliged to accept and pay only invoices that are validated by the clearance system.

Most countries in Latin America, as well as some Asian and European countries are very advanced.

Within Europe, Southern and Eastern European countries are leading the trend. Portugal requires invoice issuers to report up to ten invoice records to tax authorities in electronic form. Certified software is required. Since 2017, Spain requires initially 63,000 businesses (both issuers and receivers) to report invoice records and other fiscal data electronically to tax authorities within 4-8 days of the transaction. Since July 2018, the invoicing software used by Hungarian businesses is required to have a direct data connection to the Hungarian tax authority. Hungarian businesses have to report sales invoice data if the VAT on a B2B invoice exceeds an amount of approximately 320 Euro. In Italy, B2G and B2B e-invoicing is mandatory for issuing and receiving and a B2C mandate for the supplier side.

The objective to significantly reduce the VAT gap cannot be achieved using models based on a voluntary participation with some incentives. Hence, tax payers are increasingly required to use the clearance system. If they do not use it, use it improperly, or if they miss deadlines, they risk to be fined. Fines vary greatly, but are often high [3].

The aim of tax authorities in advanced countries is to digitise all documents and processes that are relevant for tax purposes. This affects many topics.

Most business processes are directly or indirectly affected by tax and audit requirements. Therefore, one item after the other in the next chart might become subject of digitalisation and a data exchange via clearance model.

Figure 13: Digitise tax-relevant business documents

Expected future development of the clearance model

- It will eventually cover all kinds of fiscal documents, such as invoices, payments, payment receipts, credit notes, debit notes, monthly salary statements etc.
- All steps from invoice issuance until collection will be tracked and traced.
- Pure e-reporting schemes are expected to evolve towards advanced e-invoicing clearance systems
- Buyers may increasingly be required to become full part of the electronic cycle (in step one, the requirements affect mainly the suppliers)
- It will include also cross-border invoices
- Periodical post audit or near-real-time systems will evolve into real-time models
- It will extend to inventory reporting
- It will be linked to the physical supply chain: supplies will be tracked and traced from the time they are imported into the country or produced domestically until they are sold. This information will be matched with the financial supply chain documentation, such as invoices.
- Geographic preferences for different forms of the clearance model in the next three years
    - Europe, Northern America, Pacific Region and Japan: Establish or improve clearance models with a main focus on reporting of sales invoices; incentives for voluntary implementation
    - The rest of advanced economies: In many countries, invoice issuers are required to use clearance models for e-reporting and e-invoicing. Invoice receivers are required

to use them for electronic interaction with tax authorities and suppliers of goods and services.

Many readers may find the requirement for an e-invoicing and e-reporting clearance model unappealing at the first glance. Nevertheless, it is clear that both tax payers and service providers benefits from it:

- On the positive side, e-invoices that are issued using clearance models reduce tax compliance costs by 37-39% for corporate businesses, and 8-56% for private businesses compared to paper invoices [10]. This encourages many multinational companies to push forward their e-invoice projects.
- The process is secure from the legal point of view due to mechanisms that guarantee the validity and rule out repudiation of origin. This will reduce fraud.
- Compared to the post audit systems, it ensures in real-time that fiscal documents are tax compliant. This significantly reduces the risk of fines, which could be imposed several years after the business transaction has taken place.
- Automation of tax relevant processes replaces manual and periodic reporting forms; VAT declaration & deduction are no longer required, and collection and refund can be done automatically.
- Scan and capture are eliminated, or reduced substantially.
- Where applied, it results in significant reduction of the VAT gap. This paves the way to decreasing tax rates in the future.
- Countrywide message standards are established, reducing the heterogeneity.
- Issues related to interoperability between service providers are easily solved, or become irrelevant.
- Very broad and rapid market adoption sharply increases the processed volume, resulting in much lower transaction costs compared to heterogeneous bottom-up market developments.
- Beneficial environment for the emergence of more innovative invoice and trade finance schemes.

As a result of this broad reach, a holistic and long-term view is necessary. The final scenario is referred to as the **digital model country**.

Key features of the digital model country:

- Strategy, including all components and messages for the final scenario
- Mandatory use of a clearance model as the main pillar for all tax-relevant data
- Governments mandate clearance models based on the real B2B world to the greatest extent possible. Data concerns full-content business documents and the tax authorities use a subset of the data necessary for their controls; alternatively, only core messages are defined as the common denominator for the tax authorities and businesses, and further information is exchanged in separate extensions.
- Symmetrical implementation: relevant data that suppliers transmit electronically to tax authorities must be electronically received by buyers and vice-versa.
- Service providers play a key role for implementation for businesses and serve as intermediaries to the tax authorities and trading partners. Interoperability between the numerous service providers is particularly important in the event that the clearance model is at an early stage or does not support all business messages with an appropriate message content.
- There is greater focus on economic benefits rather than additional tax revenues.

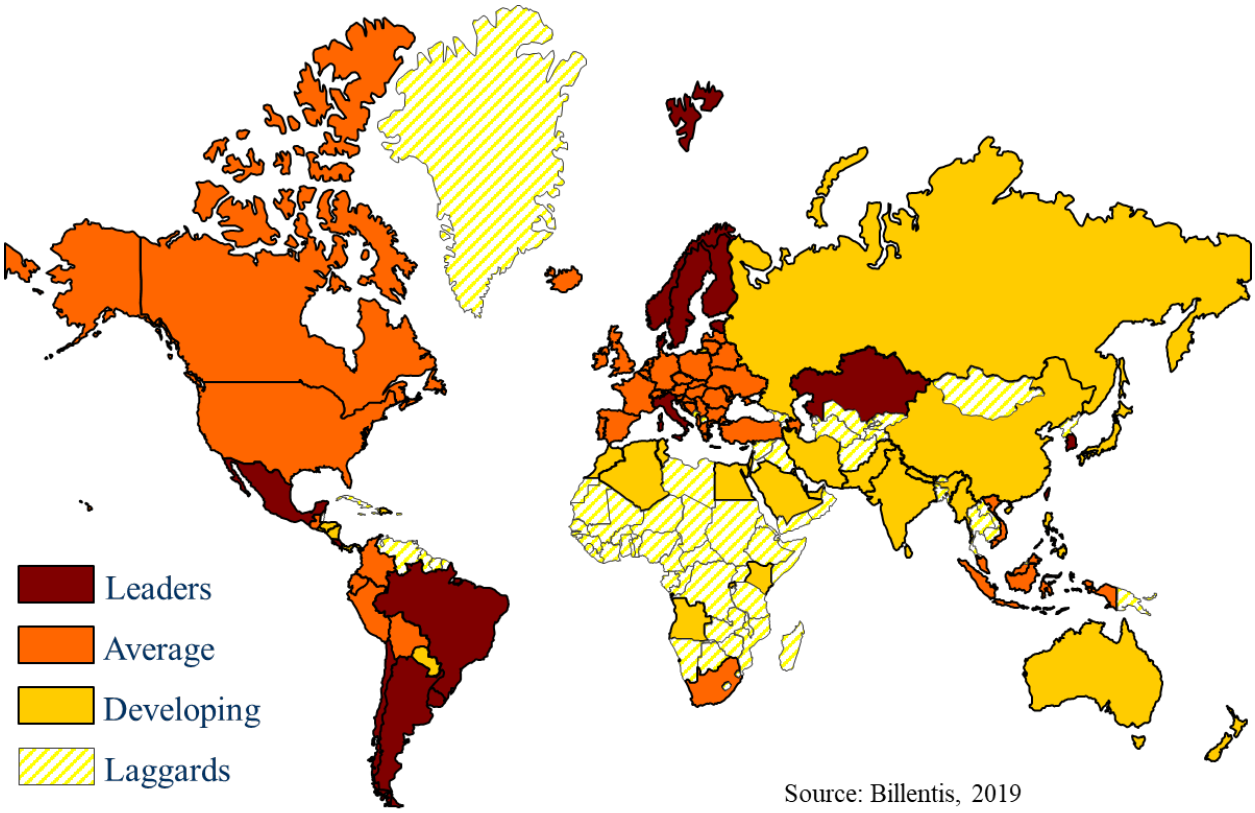
Is such a digital model country a fiction or soon reality? All components are already in use somewhere and the digital model country is simply the combination of the best components from leading countries.

2.5 The global landscape

2.5.1 Market maturity

The maturity of the market varies between continents and the countries on each continent.

Figure 14: Market maturity for electronic invoices/bills



The term 'Laggards' in the chart above does not mean that there was no e-invoicing activity in these countries. It just expresses that they are typically in a very early stage. 'Developing' means that countries have already some e-invoicing activities, typically in in the B2C segment and/or EDI between larger businesses.

It is expected that the 2019 volume for e-bills/e-invoices will achieve at least 55 billion world-wide with annual growth rates of 10-20% in mid-term.

Figure 15: Estimated volume of electronic invoices/bills in 2019

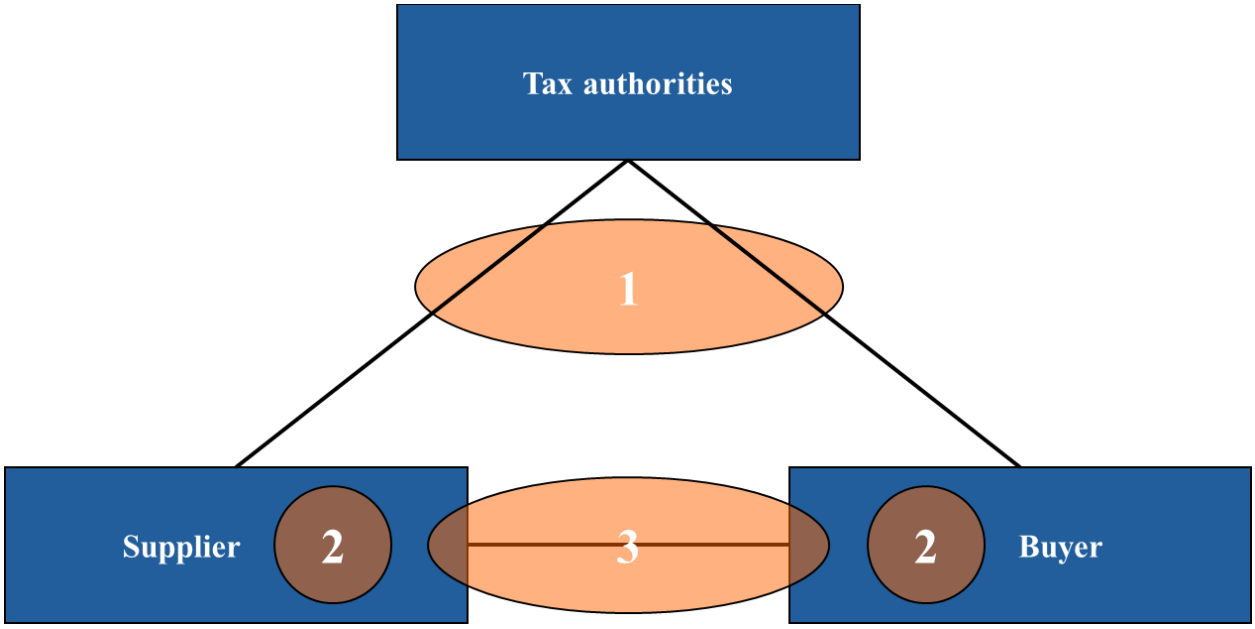
Recipient segment	Europe		LATAM		North America		APAC		Rest of World	
Consumer	5	↗	8	→	5	→	4	↗	0.5	↗
Business & Government	8	↗	13	→	5	→	6	↗	0.5	↗

Estimated electronic invoices/bills 2019 (billions, strongly rounded) Relative growth rates ↗

2.5.2 Current optimisation focus of geographical regions

There are many similarities as to how invoices are used in our world. The challenge to implement e-invoicing and to convince trading parties is also comparable. However, there are also major differences due to heterogeneous legislation, languages, cultures and the current optimisation focus. Although not applicable for all countries and organisations, we concluded that the optimisation focus seems to be as follows:

Figure 16: Optimisation focus of geographical regions



Focus	Description
1	**Asia & Latin America** (and increasingly some Southern and Eastern European countries): Country-wide projects are launched by the tax authorities with the aim of reducing tax evasion. Suppliers and buyers have to send either invoice data or at least reports in electronic format to the tax authorities for real-time validation & auditing. Typically, tax authorities disrupt the traditional paper scheme, as they design and implement a completely new system. The resulting clearance system for the trading parties is quite complex. The companies' internal invoice process efficiency and electronic collaboration between suppliers and buyers are not yet necessarily optimised, but VAT declaration and tax returns may become much easier and more efficient.
2	**North America:** Larger and mid-sized companies optimise mainly their internal processes. AR and AP automation as well as Trade Finance and Working Capital Management are a focus. However, the market becomes increasingly mature for focus 3.
3	**Major parts of Europe:** In contrast to Latin America, the conventional invoicing mechanisms and processing methods are not critically scrutinised, but replaced by a comparable working digital substitute. Suppliers and buyers can be located in various countries with different legislation. Much effort was done in EU member states to remove legal barriers. For Europeans, it is also important to build a framework, which is suitable for millions of companies of any size and from different countries. Hundreds of e-invoicing network operators offer their services, many of them interconnected with other providers. Suppliers and buyers may in most countries use e-invoicing still on a voluntary base. Although the

Focus	Description
	market is still quite fragmented, the approach in Europe can be described as relatively holistic with a strong intention to collaborate among all stakeholders.

In the long-run, all suppliers, buyers and the tax authorities want benefits with e-invoicing. This increases the chance that each continent learns from each other and adopts best-of-breed components from others.

2.5.3 Africa

EDI is increasingly being considered in high-volume industries – such as retail – for the exchange of commercial invoices and other business messages with the aim of increasing automation and cutting costs. However, the number of users is still limited.

In many African regions, the fundamental challenge is to create invoices in a tax-compliant manner after each sales transaction using an electronic device.

It is important to note the limited infrastructure available. Mobile devices are providing a suitable basis in many African countries, and acceptance in the SME and consumer market is high. A well-known example is the Kenyan mobile money system, M-Pesa [11]. It reached 80% of households within four years. Digital finance as well as electronic POS invoicing likely represent the most promising approaches to increasing the rate of adoption for e-invoicing in the African mass market. The adoption rate of mobile phones is around 60%, whereas the Internet adoption rate only amounts to about 20%. In addition to mobile apps, bills/invoices may also be created on specialised cloud platforms.

Tax evasion is also a challenge in Africa. For this reason, the first countries are starting to increase electronic control mechanisms for business transactions.

Angola has laid the foundations for applying a clearance model. In July 2019, the VAT system will enter into force. Taxpayers with a turnover of more than USD 250,000 will be affected by the new requirements. They will also have to use validated billing systems. Moreover, they will be required to produce a standard file (SAF-T) relating to the elements of billing, accounting and inventory.

In **Morocco**, new accounting requirements for larger businesses have been in place since January 2018. The aim is to combat fictitious and fraudulent invoices. One consequence is that folio numbers are required for invoices. Businesses are mandated to create and retain the accounting documents in an electronic format. Gradually, businesses will also be required to use only accredited invoicing systems and cash registers.

The **Rwanda** Revenue Authority is gradually migrating from hand-held electronic billing machines to a computer-based billing application. All traders registered for VAT receive a free application, which they can use to process and print invoices for every transaction made.
Author's remark: The two aforementioned steps can be seen as a typical evolution with the aim of creating tax-compliant invoices. A present and future step we see in some other countries is the use of mobile apps. These apps are connected to the tax authorities for clearance and data exchange with the customer.

South Africa is the only country with a robust, albeit still nascent, market for e-invoicing on the African continent. A regulatory framework for e-invoicing has existed for many years.

Tanzania has rolled out an electronic tax stamp for specific goods. This will bring about the end of physical stamps, the use of which has been linked to incidents of tax evasion and counterfeiting.

In **Tunisia**, e-invoicing is actively promoted by the government and governmental organisations. The Tunisie TradeNet (TTN) operates the 'el fatoora' platform. A Tunisian electronic invoice format (XML) and digital signatures are used. As an organisation under the supervision of the Ministry of Finance, TTN sends a copy of all accepted e-invoices to the IT centre of the Ministry of Finance. Firstly, this enables the e-invoices to be forwarded to the accountants of ministries and public authorities via a dedicated system, and secondly it facilitates various uses by the fiscal authorities.

2.5.4 The Asia Pacific region

Remark: We allocate Belarus, Turkey, Russia and Ukraine to Asia and not Europe.

There are some very advanced countries. The leaders are **Kazakhstan, Singapore, Hong Kong, Taiwan and South Korea**.

Australia and NZ intend to actively push e-invoicing on a broad scale. A multi-stakeholder forum, the Australian Digital Business Council, was kicked off in December 2015. One of the council's first deliverables concerns a document for an e-invoicing interoperability framework [12]. Several service providers have already implemented an interconnect based on this approach. In 2018, the two countries signed the Trans-Tasman e-invoicing arrangement. It is the latest milestone in the Australian and New Zealand Governments' commitment to progress e-invoicing as part of the Single Economic Market agenda, which aims to create a seamless Trans-Tasman business environment. The objective of the Arrangement is to create and maintain a common Australia and New Zealand e-invoicing approach in order to improve productivity and reduce the costs of doing business for both government and industry through an interoperable single digital economic market. It builds on the work of the Australian Digital Business Council respectively OpenPEPPOL.

A local consultant [1] analysed the invoicing market in **China**. It was determined that the market has a size of over 200 billion invoices annually. The analysis is mainly based on information from the National Bureau of Statistics, government ministries and the National Economic Information Centre. In recent years, the e-invoicing industry has gradually expanded from e-commerce and telecommunications to insurance, retail, catering, transportation, public utilities and other industries. Geographically, it has also been extended from individual pilot areas to the whole country. According to public information, 1.31 billion electronic invoices were issued in 2017, resulting in service market revenues of approximately EUR 32 million. The market is expected to reach 54.55 billion e-invoices by 2022. Emerging technologies are also being tested. A pilot project for blockchain-based electronic invoicing is in progress and the system is being implemented by Shenzhen Taxation Bureau and Tencent.

Over recent years, **India** prepared the field for allowing e-invoicing more broadly. India has also established a national Goods and Services Tax (GST) scheme. A key component forms an IT backbone that digitalises interaction with tax payers. The Company Goods and Services Tax Network (GSTN) [13] has been established primarily to provide IT infrastructure and services to the central and state governments, tax payers and other stakeholders for implementation of the GST. Since mid-2018, all states have been requiring the use of eWay bills for intra-state goods transactions, whose value exceeds INR 50,000 (around EUR 700).

Since July 2016, almost all taxable entrepreneurs in **Indonesia** are required to issue their VAT invoices (Faktur Pajak, FP) electronically and settle tax payments online only. On the buyer's side, the e-invoice they receive should be validated by the VAT input feature in the e-invoice application or by scanning the barcode or QR code as shown on the e-invoice. In practice, many buyers ask suppliers to provide them with the Faktur Pajak in paper form before they make payments. This is to ensure that the Faktur Pajak has been reported to the Indonesian tax authority.

In **Japan**, it is common practice to stamp the traditional paper invoices with visible seals. Technically, this can be shown with PDF invoices. Today, these PDF invoices are typically printed for archiving reasons. Tax reform is currently in progress. During the transitional period from 2019 to 2023, an invoice system will be introduced. This could pave the way for acceleration in the e-invoicing market.

Kazakhstan is dynamically transitioning towards the digital state. It follows a very holistic approach including the financial and physical supply chain. Since January 2019, all VAT payers and importers are required to issue invoices electronically only.

The administration [14] is able to quite accurately estimate the size of the **Russian** market in accordance with the definition in this report. Around three billion invoices are exchanged every year in the B2B and B2G segment. E-invoicing activities began relatively late. Nevertheless, the current stage of e-invoicing in Russia may now be described as developing in a highly dynamic manner.

The size of the **Turkish** market amounts to two billion annual invoices [15]. With respect to e-invoicing, the country has made huge progress over recent years. It implemented e-invoicing requirements gradually for an increasing number of industry sectors. In a first step, the Turkish Revenue Administration (TRA) established a state-owned e-invoicing platform. Third-party service providers are interconnected with the TRA platform, and they leverage market reach significantly. All the invoices based on this e-invoice scheme are transmitted and received through the TRA system. In addition, Turkey has an e-archive scheme in place. It works even if a recipient is not listed in the e-invoice registry. In the e-archive application, the invoices are transmitted to end-users via electronic mail (in PDF format or structured data with an embedded 'style sheet') and sent invoices are submitted to TRA as a report. At the request of end-users, the e-archive invoice is printed out and can be delivered to the user as a hard copy. Fortunately, only around 10% of recipients ask for this.

A decree on e-invoicing has finally been approved and released by the **Vietnamese** government. It makes e-invoices compulsory for all enterprises from November 2020.

2.5.5 North America

In the B2B/B2G segment, the perceptions and objectives differ broadly from the European or Latin American approach. The optimisation of internal operations 'order-to-cash, AR automation' and 'purchase-to-pay, AP automation' is currently a main objective for U.S. businesses. Various surveys imply that the U.S. is clearly past the early adoption phase of electronic invoicing and that the interest in this topic is rising.

200+ e-invoicing network operators are in place. Because the U.S. does not have VAT, but a sales tax system, invoices are not considered any different from other business documents. It has therefore taken some time for the value of e-invoicing network operators to become recognized on the U.S. market, but now the number of such operators is expected to increase steadily in the coming years. Multi-national organisations are required to comply with local mandates abroad. Third-party service providers are typically involved for this. Another fact might also prove to be

an accelerator for third party service providers: A high number of enterprises are interested in e-invoicing solutions, but are faced with a limited budget/funding. External services on demand instead of in-house solutions help to overcome this barrier as well.

Surveys also directly or indirectly taking consideration of the e-invoicing topic are relatively rare. Most currently focus on the AP side, and mainly with regard to very large businesses.

Considering various sources, the results for larger businesses can be summarised as follows

- Roughly two-thirds of businesses issue PDF invoices via email, but less than 20% structured e-invoices via EDI. The largest suppliers are willing to send an electronic file in the customers preferred format. Most connections are created on a one-off basis, the supplier adapts top the customers requested sending format. These suppliers are members of most of the prevalent networks, and do not have a preference for one over another.
- Measured by volume, about two-thirds of the invoices are still received in unstructured formats like paper and PDF invoices. Hence, extracting data from any machine-readable PDF is gaining momentum.
- Supplier portals are in place.
- Commercial Cards (including purchasing, ePayment and virtual cards) are popular and common for purchases with a high volume, but a small amount. Using P-Cards is directly affecting the invoicing volume and the kind of processing; trend: moderate increase and expansion into the segment of high-value purchases.
- Third-party services like e-invoicing networks or alternatively SaaS becomes increasingly important. Using this service helps significantly reduce high in-house investments, but at the same time paves the way to exploit the saving potential.
- Any alternative invoice payment and cash optimisation instruments are clearly gaining momentum. Offerings for Dynamic Discounting and Supply Chain Financing vehicles are benefitting in particular.

Despite the interesting results for larger businesses has it to be considered that the vast majority of U.S. businesses, however, employ less than 500 employees. Their behaviour and their preferences are not sufficiently reflected in today's available surveys. If the market behaves in a way comparable to the corresponding user segment in other countries, we may soon expect a very solid growth of third party cloud services.

Beyond North America, tax authorities as well as the public sector in the role of major buyer and invoice recipient are already active drivers for e-invoicing. This development cannot be observed in North America, although the U.S. Federal Administration announced an e-invoicing mandate some years ago. Following a pilot programme which explored the feasibility and benefits of e-invoicing in the public sector, the Office of Management and Budget (OMB) released a memorandum directing federal agencies to transition towards electronic invoicing. The intention was for government agencies to begin mandatorily processing all invoices electronically by the end of the 2018 financial year. Although digitalisation has arrived in the federal administration to some extent, it is not yet to have the same impact on e-invoicing that can be seen with the B2G mandates in Europe.

Local experts see several shortcomings. For example, the mandate did not specify what type of e-invoice should take the place of paper invoices, and there was no mandate for the use of a specific format. Due to the lack of drive from the government and public sector, the private industry seems to be taking over the driving seat to a large extent. Local experts believe that a specific e-invoicing interoperability network for the USA is the fastest way for the country to catch up with advanced regions.

In 2015, the Federal Reserve issued Strategies for Improving the U.S. Payment System including one desired outcome of achieving greater end-to-end efficiency in the U.S. payment system.

To support the desired outcome of increasing B2B efficiency, the Federal Reserve launched a new initiative under the Business Payments Coalition (BPC) [16] that focuses on increasing e-invoice adoption by all types and sizes of U.S. businesses.

The BPC is in the midst of its three year plan to identify, design and adopt an e-invoice interoperability framework for the U.S. market. The BPC convened a work group, which is assessing the European Union e-Invoice Standard Semantic Model (EN-16931) as a baseline for a U.S. e-invoice semantic model. They are also assessing various approaches used by e-delivery networks, such as PEPPOL and EESPA for requirements to establish a similar network for the U.S. Their goal is to develop requirements for a U.S. version by the end of 2019.

In 2019, the BPC will convene additional work groups to begin assessing existing Governance framework models and adoption strategies. This work is scheduled for completion in 2020.

In 2020 and beyond, the BPC will continuing working with the industry to adopt the standards that are required for establishing a U.S. framework. These efforts include ongoing collaboration with various standards bodies such as X12 and OASIS UBL and organizations such as Open-PEPPOL and EESPA.

Ultimately, the goal of these efforts is to define U.S. e-invoicing requirements and align as closely as possible with established frameworks to help foster global interoperability. U.S. businesses will be able to reap the benefits of this work as service providers begin adopting the framework standard and requirements developed by the BPC. This work could serve as the launching point that accelerates adoption and increases the exchange of e-invoices in the U.S. market.

The market evolution in Canada is comparable to the one in the U.S.

2.5.6 Latin America

Chile may be identified as the root of the Latin American market model and its development. Other markets like Brazil and Mexico are among the early adopters and some of them overtook Chile due to strict mandates for the usage of e-invoicing in that country. Meanwhile, almost all other countries in Latin America are rapidly evolving.

Argentina's tax authority (AFIP) expanded the mandatory e-invoicing regime to all sectors of the economy in spring 2019. Argentina moved towards the mandatory massification of e-invoicing as of April 2019 with a new billing scheme, the Electronic Invoice Issuance System (RECE).

With very few exceptions e-invoicing is mandatory for all businesses in **Brazil** and around 1.6 million businesses issue e-invoices for goods [17]. This result was possible due to the strict implementation of its e-invoicing requirement several years ago. It is a pleasure to see Brazil also as one of the innovators for users in the retail segment. The aim of the NFC-e project is to provide an alternative to the current fiscal printers used in the retail segment in the form of a fully electronic solution, based on an XML file, including a digital signature which is authorised online before the payment at the point of sale. NFC-e follows the same technical and operational model of the NF-e (B2B/B2B) used for all industry and wholesale companies in Brazil. NFC-e is already in operation in the majority of the states. Electronic reporting and auditing plays a key role in Brazil and its scope is gradually broadened. Ground-vehicle freight is increasingly

tracked and traced and businesses are even required to also submit monthly inventory and production reports. E-reporting or e-filing increasingly considers all documents relevant for tax purposes. This also includes documents regarding labour costs, employment etc.

Chile was and still is a very innovative country. After several years of following a voluntary approach, the tax authority meanwhile declared electronic invoicing as mandatory for all businesses. Where it is not uncommon to declare the issuance of e-invoices, Chile is more advanced than the average also to consider the receipt of e-invoices. In 2018, the government also launched an innovative mobile app that permits the issuance and validation of e-invoices.

Bolivia is set massively to roll-out e-invoicing. The National Tax Service (SIN) announced the entry into force of the new electronic invoicing system starting mid of 2019. In the first wave, it becomes compulsory for 175,000 taxpayers. Remaining taxpayers will gradually be required to adopt the new billing system within roughly 12 months.

Colombia started 2018 in rolling out their e-invoicing mandate for larger businesses. 2019-2020 is a transition period and from August 2020, e-invoicing will become a hard requirement for all businesses.

Mexico is the leading country worldwide. It comes close to its objective of digitalising all processes relevant for taxation. Electronic invoices for goods and services form a key part of this digitalisation. Mexican organisations exchange about 10 billion e-invoices on an annual basis.

Additional initiatives are being taken in Mexico beyond electronic invoicing. E-accounting has become mandatory for companies and individuals.

Besides efficiencies in the generation, distribution, archiving, collection and reduction in the use of paper, Mexico's positive results in the adoption of e-invoicing and e-accounting have paid off in the reduction of tax evasion. The clearance model goes far beyond the reporting of accounting and invoice data. It also includes e-audit and documents regarding the relationship between businesses and their employees. For example, all the monthly salary slips must already be sent electronically.

In addition to the past and present activities regarding the domestic electronic exchange of tax relevant information, there are also projects in progress in order to consider cross-border invoices. Mexico intends to expand the international acceptance of electronic invoices across the American continent. The SAT is therefore working with tax authorities in several Latin American countries, the United States and Canada.

The approach in **Peru** takes international standards into consideration (UBL 2.0 as the content standard). It will enable easier integration with trading partners in the European Union as well as APEC (Asia-Pacific Economic Cooperation) countries. The Peruvian model has similarities with the Brazilian model, insofar as shipping documents are also encompassed. Either the 'Factura' or 'Boleta' should accompany the carrier in combination with the 'Guia de Remision' (signed bill of lading that forms part of the process). As of this year, some businesses have to enter their customer's DNI in the electronic sales slips, so that they can deduct the expense for Income Tax purposes. This paves the way that customers can receive electronically and process them automatically in the AP system.

In **Latin America**, the initiator for the market activities is in most cases the government. The driver for establishing countrywide e-invoicing is often the reduction of tax evasion through real-time or near-real-time invoice validation by tax authorities. This can be achieved by mandating an electronic invoice loop between supplier, the tax authorities and the supplier.

Although the legal requirements are among the strictest worldwide, some countries in Latin America have taken over the global leadership role. Not only do some of them already have high market adoption rates, but their model is also inspiring larger countries in Asia and in Southern and Eastern Europe.

Typical characteristics of e-invoicing in Latin American countries are

- Unique/sequential invoice numbers (folio) provided by the tax authorities
- Use of digital signatures based on suppliers' certificates, issued by approved or state-run Certification Authorities.
- Imposed XML standards for tax authority clearance
- Steady reporting to the tax authorities: either in real-time prior to issuance or at least monthly.
- Consider the classical invoices, but also other tax documents like credit notes, debit notes, receipts respectively 'boletas de ventas' or 'tickets' as they are also named
- Increasing integration with the physical supply chain e.g. simultaneous print-out of ancillary transport documents based on a pre-approved invoice
- After review/approval of suppliers' invoices, tax authorities put in some cases a visible 'stamp' to the generated PDF invoices. It is either a country specific alphanumeric code or a barcode / QR code. In other cases, they add a verifiable electronic token (e.g. a digital signature) to the structured invoice file.
- Recipients often have to validate that the invoice was pre-approved by the tax administration
- Tax authorities validate either the invoice data real-time or data-mine to check invoices later.
- General archiving period is five years.

Service providers play a key role. In some countries, service providers are accredited to perform clearance services on behalf of the tax administration; such service providers may also offer value-added services around these regulated functions. While many service providers are local, a good number of them are active in several Latin American countries and already process a very remarkable invoice volume. They belong to the largest operators worldwide and some of them are now entering into the American and European market.

2.6 The European Market

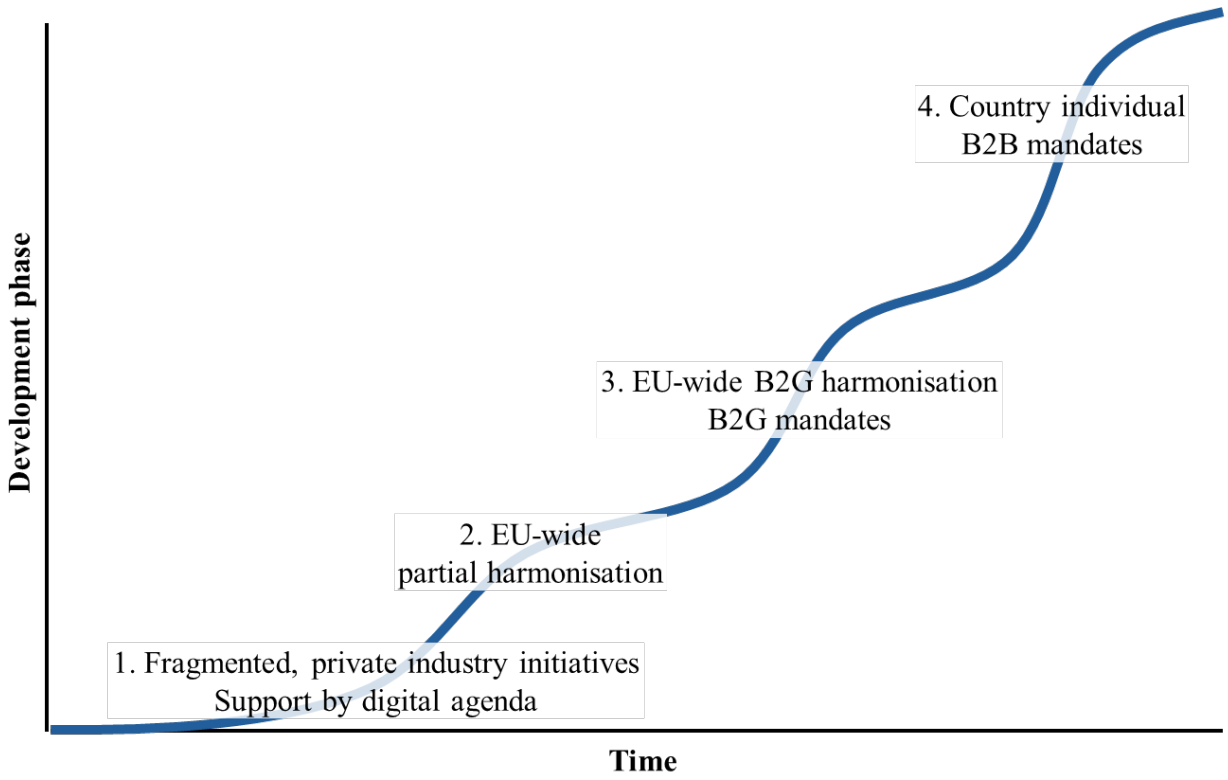
2.6.1 Market characteristics and development

The European landscape is not comparable with Latin America or the U.S. for several reasons. Here just some facts about Europe in the narrow sense:

- 40+ countries (28 of them members of the European Union)
- 40+ legislations
- 100+ languages
- 22+ million SMEs (with less than 250 employees)

Europe has a long tradition of optimising electronic business processes, but the development happens step-by-step.

Figure 17: E-invoicing development in the European Union



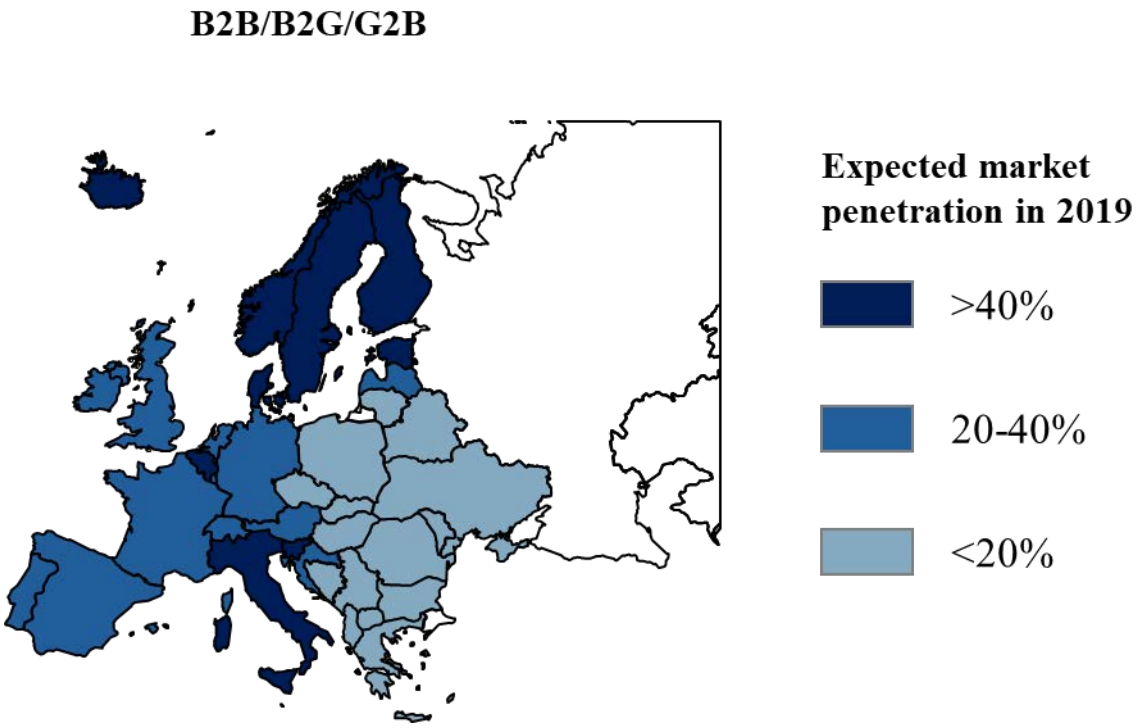
Phase	Description
1	Classical bottom-up growth in each single country, solution and service providers developed the market in the early stage, but with an isolated approach. Especially the stakeholders in Nordic countries launched national initiatives for improving the collaboration. E-invoicing became increasingly a cornerstone of the digital agendas defined and pushed by the government; first national multi-stakeholder fora were founded with the aim for faster market development and at least harmonisation on national level.
2	Due to the market fragmentation and growing cross-border trade, e-invoicing became a key topic also in the digital agenda and activity plans of the European Commission. It resulted in some directives, removal or reduction of barriers and standardisation work.
3	In 2014, directives 2014/24/EU and 2014/55/EU were released. They affect probably more than 300,000 public administrations in EU member states. They are obliged to support a certain e-invoicing standard and to be able for automated processing of electronic invoices. In addition they had to change certain procurement processes towards electronic procedures. Although the EU directive is affecting just the public sector, it paved the way to declare B2G e-invoicing as mandatory. In 2019, roughly half of the member states practise a B2G mandate or announced it for the near future.
4	Since January 2019, B2B e-invoicing is mandatory in Italy. Further countries might follow soon.

2.6.2 The Business-to-Business & Business-to-Government market

2.6.2.1 Market penetration

Status and market development differ from country to country.

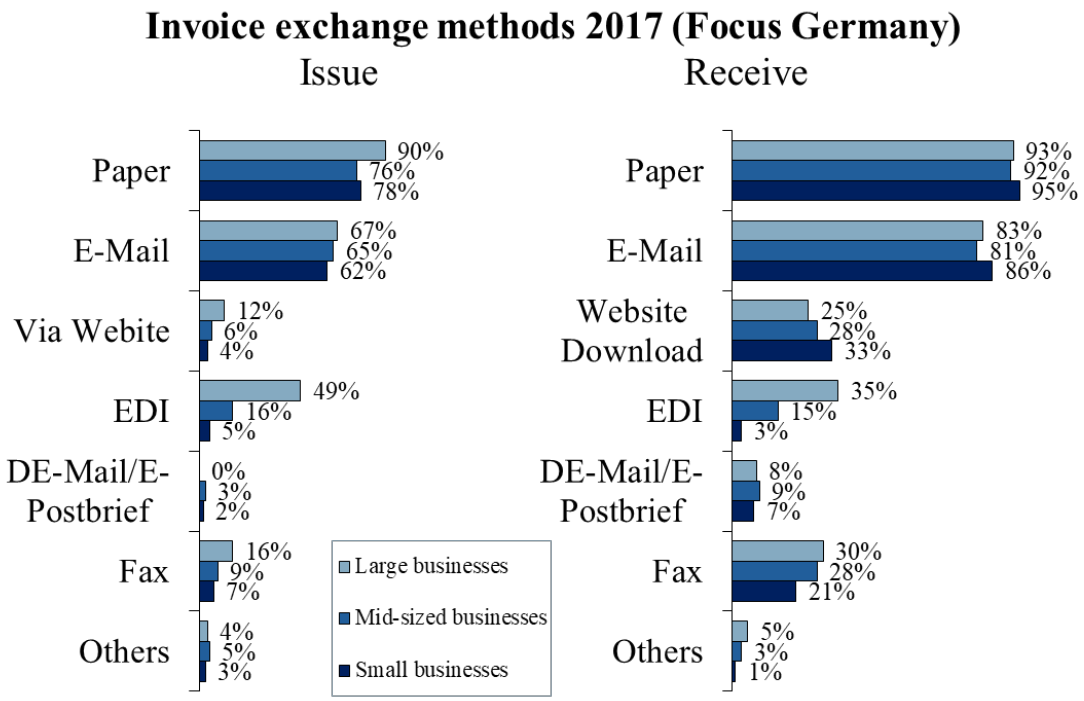
Figure 18: B2B/B2G/G2B: Estimated market penetration 2019 per country



2.6.2.2 Exchange formats

The usage of formats and channels differs a great deal depending on the country and the size of companies. It is extremely rare for companies to issue or receive invoices just in one electronic format. Unfortunately, no international survey gathered such data on a comparable base. That is why we share here the results of a study done with survey participants in German-speaking countries in 2017, with a focus on the largest European country.

Figure 19: Multi-channel invoice exchange methods in German speaking countries



Source: ibi research [18]

Multiple answers were possible. The majority of companies interviewed are located in Germany and are enriched with a few survey participants from Austria and Switzerland.

Conclusions for the European market

- Multi-channel exchange strongly dominates the landscape.
- There are already some suppliers offering invoices exclusively in electronic format (e.g. online shops, subscribed services).
- Exchange via E-Mail is more popular than via EDI.
- E-Mails are preferred by SMEs, but are also often accepted by larger companies.

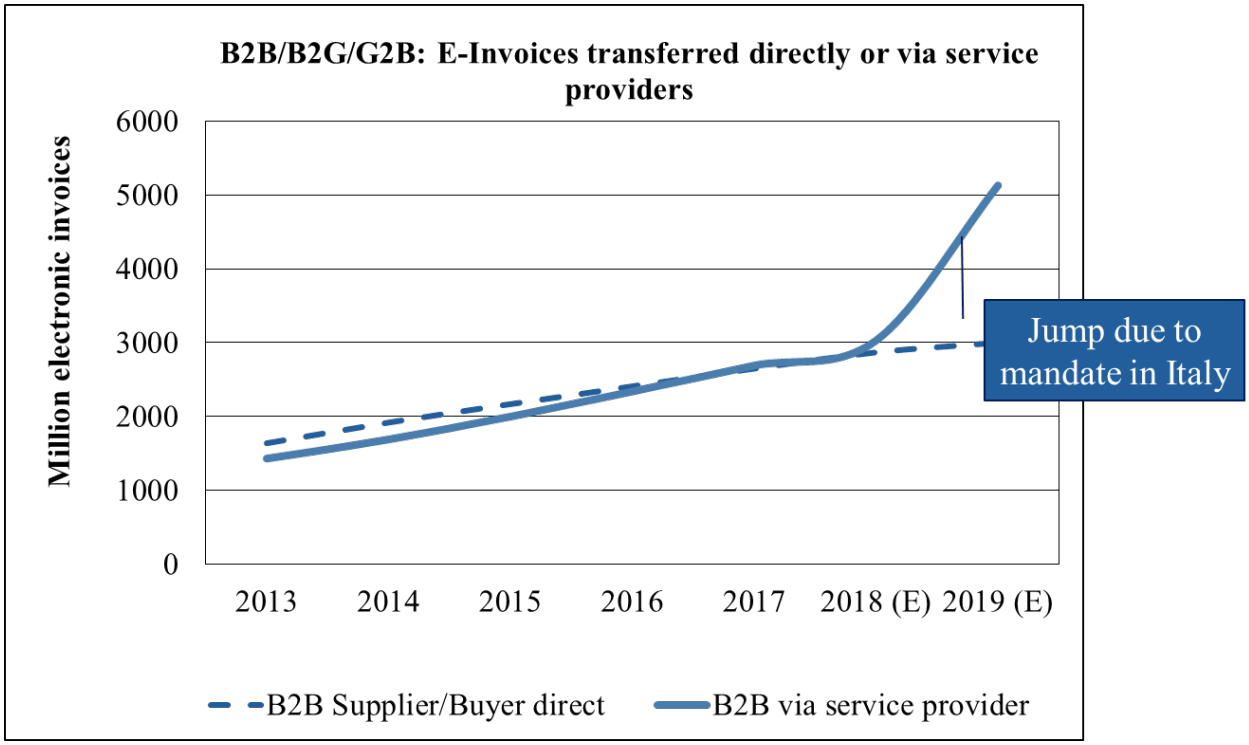
The long-term intention of most stakeholders is to exchange, process and archive most electronic invoices in a structured format. The high-volume industries (e.g. retail, automotive) were able to establish this in the first stage of market development. EDI, and in later years XML, dominated the e-invoicing landscape. Trading parties were typically larger enterprises. The more the mid-sized and smaller companies entered into the e-invoicing market, the more the PDF volume increased. The benefits of image-based PDFs are mainly limited to cheaper transport and archiving, but process automation does not really happen and cost savings stay limited.

The public sector is definitively in the position to change the picture completely for the benefit of structured e-invoices. This is at least in progress in some countries. Governments mandating its suppliers to send invoices just in electronic format typically ask for XML and do not permit PDFs (e.g. Austrian Federal Administration).

2.6.2.3 Distribution channels

The supplier direct model is currently dominating in many countries like Austria, Germany, the Netherlands and the UK. Other countries intend to have a clear preference for e-invoicing network operators, in particular smaller pioneer countries.

Figure 20: Invoices received by European enterprises according to delivery channels



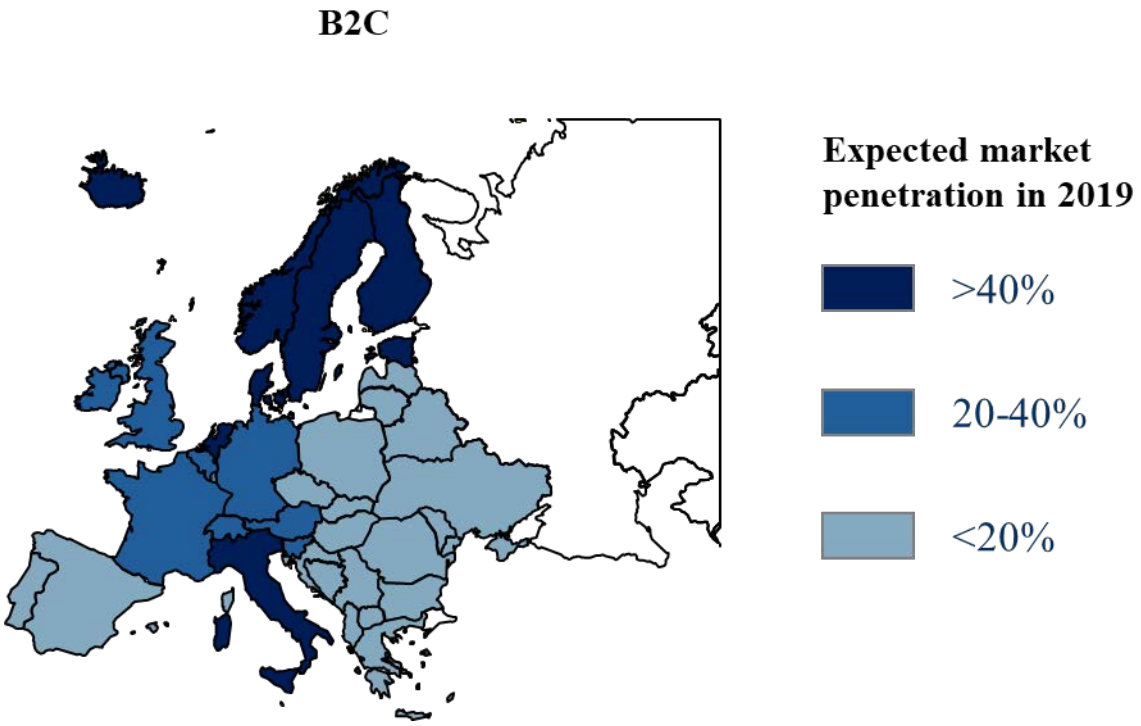
2.6.3 The Business-to-Consumer market

2.6.3.1 Market penetration

In the intercontinental context, the European payment options are in most countries relatively convenient. Collective payments, Electronic Fund Transfers and Direct Debits are quite popular bill payment methods. Payment did not turn out to be a driver for e-billing in Europe. There are also indications that European households receive (relatively) fewer bills than the consumers in most other continents do. Thus, e-billing is not yet very advanced in most European countries and the market penetration lags behind the development in the B2B segment.

Status and market development differ from country to country.

Figure 21: B2C: Estimated market penetration 2019 per country



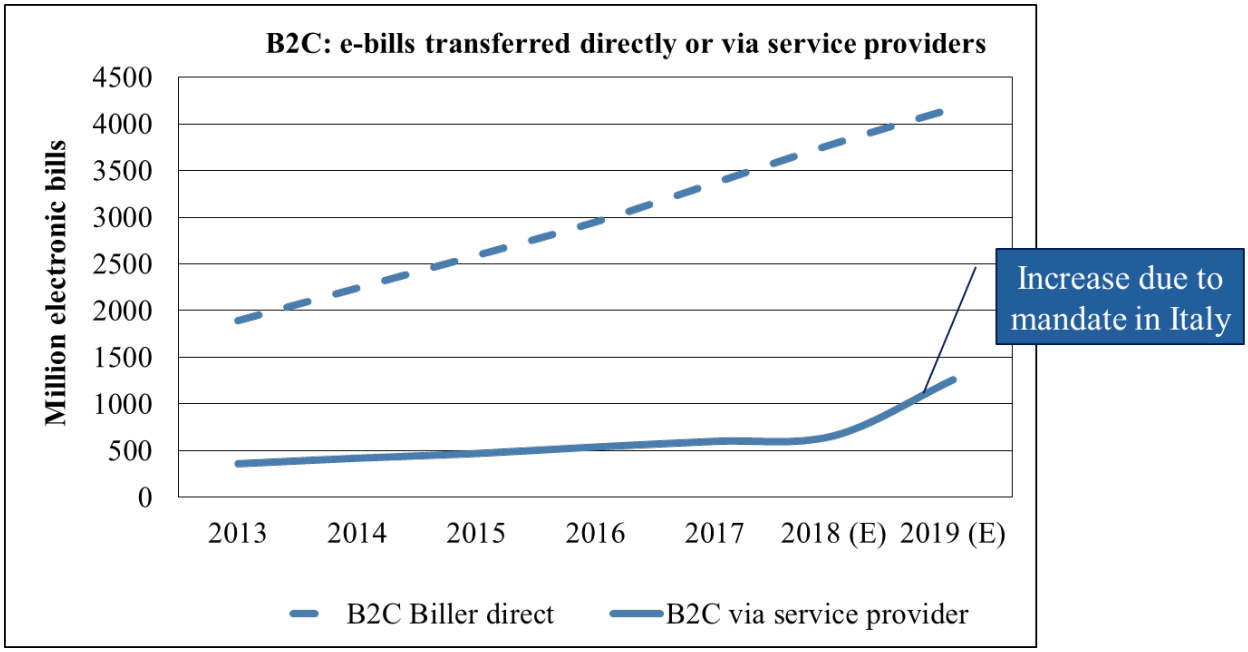
2.6.3.2 Transition from large innovators to mass market

Most large billers have meanwhile an acceptance of 30-90% for e-bills with a majority of around 45-60% of their customer base. The few available surveys confirm that still mainly younger consumers use e-billing. Obviously a paradigm shift, a new approach and some more years are needed to achieve the mass market. This could for example be an innovative electronic POS and mobile billing model.

2.6.3.3 Distribution channels

Most consumers prefer to receive electronic bills via email. Email is still gaining ground in many larger countries and could be the preferred delivery channel for two-thirds of European consumers. Bill presentment on the supplier portals and via internet banking does not play a major role in most European countries. An exception build the Nordic countries, where the exchanged e-bill volume via online banking portals is almost as high as the one distributed by other channels. Electronic POS and mobile billing could launch a paradigm shift and a sharp increase of e-bills.

Figure 22: Electronic bill volume B2C, direct and via service provider



2.6.4 Supporting initiatives

2.6.4.1 Overview

The private industry is typically the catalyst for almost all digitalisation and automation projects. Although the solution providers are in competition with each other, as well as often the users in specific industries, they frequently build supportive initiatives and associations with the aim to standardise and promote the new technologies. Classic examples include OASIS, UN/CEFACT, GS1, CEN, EESPA (European E-Invoicing Service Providers Association), OpenPEPPOL and many national or industry-specific organisations.

The public sector supports development through a variety of activities

- Considering the topics in the digital agenda and supporting it in various ways
- EU directives and implementation into national legislations
- E-Government Action Plan
- European Multi-Stakeholder Forum: Brings together stakeholders from national e-invoicing fora and from the user side of the market. Its objective is to help pave the way for a broad-scale adoption of e-invoicing at national and EU-level. It also discusses issues of common interest and may issue recommendations to the Commission.
- Connecting Europe Facility: Funding of projects for improvements in the competitiveness of the European economy; promotion of the interconnection and interoperability of national, regional and local networks and supporting the development of a Digital Single Market.
- Launching/supporting standardisation initiatives
- Mandating public administrations to prepare their systems and processes for e-invoicing and e-procurement
- Promoting or mandating its suppliers to communicate exclusively by electronic means

2.6.4.2 Standards

In many cases, standardisation initiatives have failed to convince stakeholders to use them. A lack of information about existing standards combined with the pride of some introverted organisations has resulted in the re-invention of dozens of niche standards (domestic or industry focus) even during the last years. They can probably only survive if they build a subset of one of the

most popular global standards (Oasis UBL, UN/CEFACT) or if they are based at least on the same standard model.

An estimated 10,000 ERP and accounting solutions are used in Europe. Integrating various e-invoicing standards is outside the scope of the ERP providers. That is why many e-invoicing network operators offer any-to-any-data-formatting services. Besides legal challenges and the networking idea, these formatting services are another main reasons that third party providers play a major role in e-invoicing in most countries. As a result, issuers and recipients of invoices using such services are independent of any standards and they have no longer to wait for a market dominant standard.

Some international and industry independent standards for invoices and directly related pre- and post-processes are:

Figure 23: International and industry independent standards for business messages

Standard	Description
ebXML	ebXML (Electronic Business using eXtensible Mark-up Language), is a modular suite of specifications that enables businesses of any size and in any geographical location to conduct business over the Internet. Using ebXML, companies have a standard method for exchanging business messages, conduct trading relationships, communicate data in common terms, define, and register business processes.
OASIS UBL 2.x ISO/IEC 19845:2015	UBL, the Universal Business Language, is the product of an international effort to define a royalty-free library of standard electronic XML business documents such as purchase orders and invoices. UBL v2.1 has now been approved for release as ISO/IEC 19845:2015 Standard. UBL provides the standards for the PEPPOL (Pan European eProcurement Online) platform and public procurement initiatives in several countries.
UN/CEFACT	UN/CEFACT, a United Nations body, has a global remit. It encourages close collaboration between governments and private business to secure interoperability for the exchange of information between the public and private sector. It has developed: • The UN Layout Key for Trade Documents, which is the foundation for the EU's Single Administrative Document (SAD) • UN/EDIFACT, the international standard for electronic data interchange • numerous trade facilitation recommendations and • UN/CEFACT XML
PDF/A-3 ISO 19005-3	PDF/A is an ISO-standardized version of the Portable Document Format (PDF) specialized for the digital preservation of electronic documents. PDF/A differs from PDF by omitting features ill-suited to long-term archiving. This is a key requirement for business documents which have legally be archived in long-term. PDF/A-3 adds a single and highly significant feature to its predecessor PDF/A-2 (ISO 19005-2) specification, to permit the embedding within a PDF/A file a file, or files, in any other format and of any type, e.g. XML files.

	Germany and France jointly developed a common e-invoice format based on the PDF/A-3 approach with embedded XML data. It is conform to the requirements of the European Norm.
European Norm 16931 CEN/TC 434	The Directive 2014/55/EU required the development of a European standard for e-invoicing in public procurement with the aim of removing cross-border barriers. The deliverables of the project group include a European standard on the semantic data model for the core elements of an electronic invoice, a technical specification on a limited number of invoice syntaxes and other components. Two syntax formats approved by CEN are UBL and UN/CEFACT. The standard has to be supported by all EU public administrations. The architecture supports country usage specifications defining that some optional elements may not be used, other must be used. In addition, it supports country or industry specific extensions. Hence, it builds also a good basis for the future usage in the B2B segment.
CEN/TC 440	The main objective of this standards is to support and facilitate the electronic public procurement processes and their underlying accompanying information flows in the physical and financial supply chain. It considers standard messages for e-notification, e-tendering, e-ordering and e-fulfilment.

Industry specific standards are

- ETIS: Telecom invoices
- GS1: EANCOM, GS1 XML and GS1 UN/XML standard mainly for various sectors including retail
- ISO 20022: Financial industry
- LITIG/LEDES: Law firms
- PIDX: Oil and Gas Industry
- Rosetta Net: vehicle manufacturers

Some country specific standards are

- Austria: ebInterface
- Belgium: BMF
- Czech Republic: ISDOC (based on UBL)
- Denmark: OIOXML (based on UBL)
- Finland: Finvoice
- Germany: ZUGFeRD
- Italy: BTW, FatturaPA
- Slovenia: eSLOG
- Spain: facturae
- Sweden: Svefaktura, SFTI
- Switzerland: swissDIGIN
- Turkey: UBL-TR (based on UBL)

2.6.4.3 Improving payment efficiency

In order to protect European businesses – particularly SMEs – against late payment, the EU adopted Directive 2011/7/EU on combating late payments in commercial transactions. In light of several recent studies, this has not evidently solved the problem.

The Revised Payment Services Directive (PSD2) has been prepared and will affect stakeholders from September 2019 in practice. Financial institutions and fintech companies need to ensure that they will be PSD2-ready. A major objective is to achieve an efficient European payments market for retail payment transactions, increase integration and create the preconditions for digitalisation of the payments industry. One component of the regulation addresses access to the payment service user's account which has to be granted to third-party providers. Banks and other financial institutions are required to ensure interoperability. This paves the way for new players and encourages competition including from non-banks. These new third-party providers could also be positioned around e-invoicing services. This would become especially interesting if providers were to promote electronic POS and mobile invoicing.

3. The e-invoicing journey 2019-2025

3.1 Catalysts for a new era

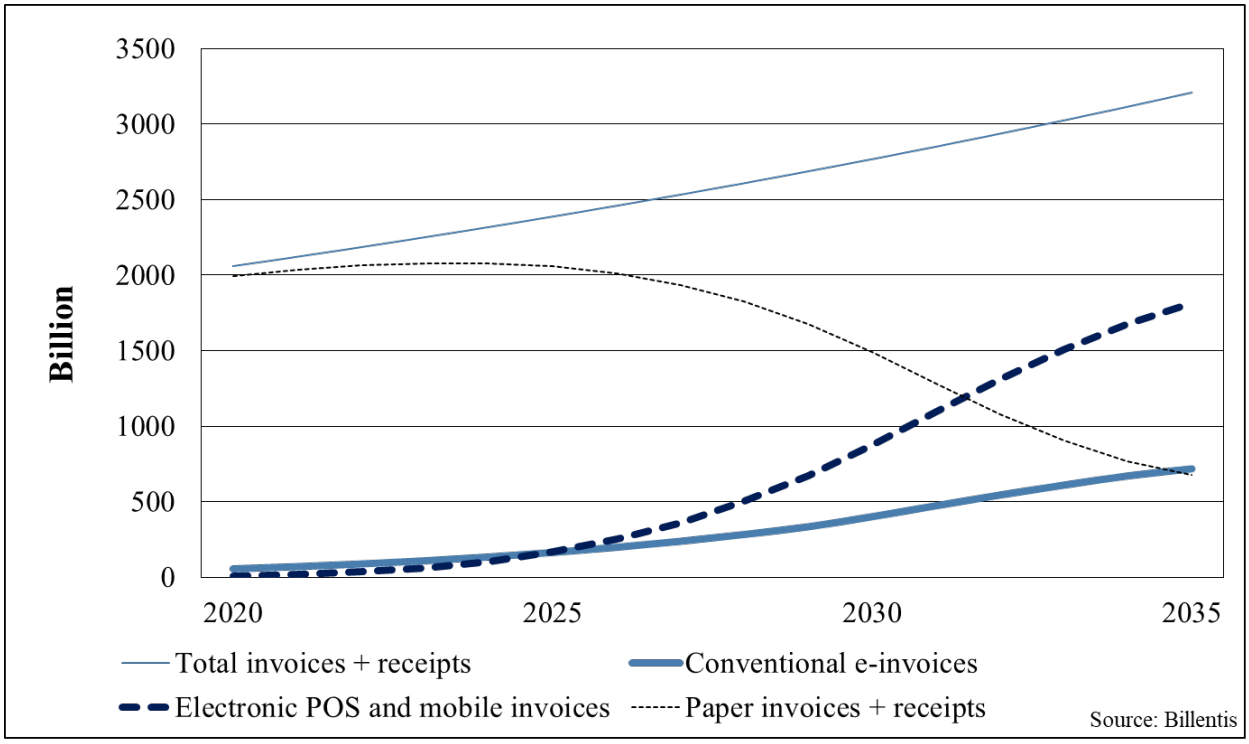
A powerful market transition and transformation is taking place in our industry. This period of movement from one stage to another creates new opportunities for innovative and forward-thinking companies, which are ready to take advantage of this shift.

In view of the rapidly changing environment, we believe that these topics are in the foreground as market accelerators and game changers for the years ahead of us:

- The regulators are increasingly fighting the VAT gap[2]. Many new government initiatives resulting in B2B, B2G and B2C e-invoicing, e-reporting, e-filing, e-auditing, and compliance requirements are prompting almost all organisations to act.
- The business models and IT systems of most organisations have evolved in times characterised by the use of paper-based processes. Businesses are required to become more agile. They are required to replace their traditional models with disruptive innovations, and to re-engineer their processes.
- Pure e-invoicing services are no longer sufficient. The demand to support additional documents, processes, and value-added services is increasing substantially.
- A paradigm shift regarding the way to collaborate between different stakeholders is in progress.
- New emerging technologies are more mature, and are ready to be used in practise.

3.2 Global e-invoice/e-bill volume is expected to multiply

Figure 24: The expected development of global invoice and receipt volumes



Several reasons support this prediction. Electronic POS and mobile invoicing is convenient for customers. For businesses, it will also play an important role for purchases at the POS (business

[2] Difference between the amount of VAT actually collected and the VAT total tax liability

lunch, office material, fuel for the company car etc.) and using mobile apps (such as train and flight tickets, as well as parking fees). Increasingly, tax authorities are requiring that customers also authenticate themselves for purchases involving small amounts and that this data is included in the payment confirmation. Otherwise, they can no longer reclaim VAT or consider the expenses as costs in their accounting systems. Hitherto anonymous receipts are substituted by invoices, which can be electronically transmitted to the customer system and processed automatically. For these reasons, electronic POS and mobile invoicing could cause the volume to increase by several factors. It could even reach the same volume as conventional e-invoicing by 2025. Although a majority of this volume would be in the B2C segment, a significant proportion would also be attributed to the B2B segment.

3.3 Increasing value of the e-invoicing market

The e-invoicing market has been around for over 20 years. Electronic documents have gradually replaced paper-based invoices. As part of the first phase, the European market was developed mainly by private industry. It was advanced globally by high-volume industries. Nowadays, however, the main driver is an increasing number of governments which require organisations to exchange invoices electronically. In this regard, Latin America is very advanced, followed by a number of countries in Europe and Asia. This trend can be seen around the world. Thanks to this additional governmental impetus, the market for solution providers and integrators is rapidly growing.

Billentis estimates that the size of the global e-invoicing and enablement market in 2019 is EUR 4.3 billion (USD 4.9 billion), and that it will reach approximately EUR 18 billion (USD 20.5 billion) in 2025.

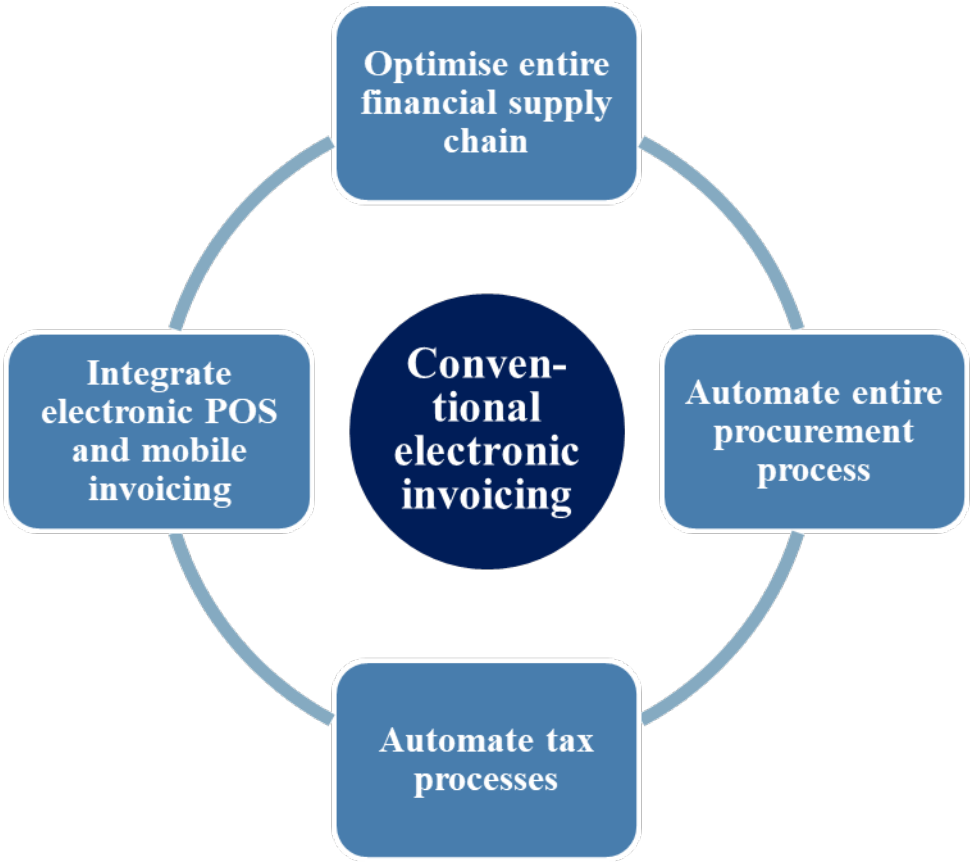
One of the assumptions is that all Latin American and most Asian countries will have established a clearance model by 2025 and that they will require market participants to exchange invoices only in electronic format. Another assumption is that a significant proportion of the previous anonymous payment receipts will be substituted by actual invoices. The estimates include solutions and services that are directly related to e-invoicing, as defined in this report, including exchange networks, communication gateways, SaaS, PaaS, implementation costs and directly related value added services such as data validation, formatting and synchronisation. This estimate does not include workflow or archive solutions, or the processing of data related to invoices (purchase orders, catalogues, sourcing and payment).

Asia and Latin America are expected to achieve the highest annual grow rates (CAGR 56% and CAGR 30%, respectively). Europe has the highest market value today but may only achieve single-digit percentage annual growth rates by 2025 on average. However, this is attributable to the fact that the initial situation is already advanced. Another important reason is that the unit prices may fall significantly faster than elsewhere. The average transmission cost per e-invoice is currently much higher than the average cost worldwide. This is due to the very fragmented market structure, the high number of small solution providers that operate mostly on the domestic market, as well as different languages, legislations and standards. In contrast, countries with clearance models and e-invoicing requirements feature a highly standardised approach, with electronic invoices accounting for a relatively high proportion of total invoices. Interconnections between different e-invoicing network operators are very easy and economically efficient to implement and operate. The average cost per e-invoice in countries with clearance models is therefore typically in the low single-digit range measured in Euro cents.

3.4 Broadening of scope

Pure e-invoicing is no longer sufficient. An aligned or integrated approach with related topics is necessary to exploit the full potential.

Figure 25: Broadening of scope

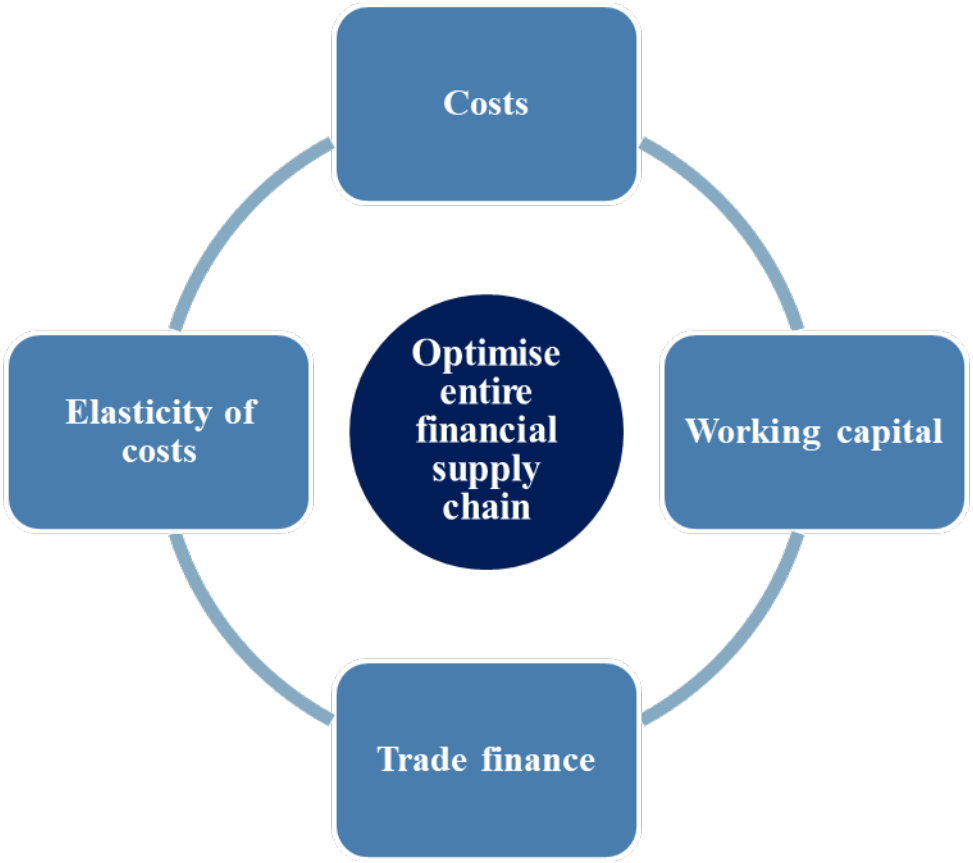


3.4.1 Optimise financial supply chain

There are of course several reasons to start an e-invoicing project, but one is the strongest driver: Even during a period of robust economic growth, organizations state that the major drivers for process automation were the improvement of financials. This is especially valid during today's challenging economy.

The author sees a set of parameters where e-invoicing has a major impact on the optimization of corporate finance.

Figure 26: Optimise corporate finances with e-invoicing



3.4.1.1 Reduce costs

Chapter 3 of a separate document describes in detail how the Business Case might look like – and that is already very promising. The author intended to apply today's reality to those calculations: Organizations replace a portion of its paper invoices with electronic ones and only partially optimize their processes.

3.4.1.2 Increase elasticity of costs

Customer demand today is becoming more and more erratic and the turnover is subject to considerable variations.

Thus, most companies try to reduce fixed costs and to shift them towards variable costs. Providers of e-billing/e-invoicing solutions reacted at a very early stage and offer suitable products for any kind of demand.

Due to investment freezes in many companies and attractive on-demand pricing, numerous businesses change from in-house operated solutions to SaaS (Software as a Service), white label or network services offered by third parties.

It is therefore scalable regardless of organization size and, most importantly, businesses only pay for the services they use.

3.4.1.3 Improve Working Capital

A corporate credit squeeze, combined with uncertainties regarding economic growth, change financial managers' minds on working capital optimisation. Invoice automation is a key component to achieve this objective!

There is a growing demand for financially efficient supply chains, with customers and their suppliers under conflicting pressures to improve payment terms, reduce prices and improve cash flow efficiencies.

A number of related buzzwords currently dominate the mass media

- Optimize cash flow and working capital
- Decrease DSO
- Accelerate processing and workflow cycle to benefit (dynamic) discounts
- Payment guarantees; Reduced risks
- Trade Finance; Supply Chain Finance
- Access to liquidity; Reduce capital outlay
- On-demand SCF (not full turnover, just some invoices)
- Enable suppliers to keep pace with buyers' growth.

These topics reflect the market demand, but also what providers of such finance tools and instruments increasingly offer.

The major challenge for solution providers is to offer a balanced product portfolio appropriate for suppliers and buyers, regardless of company size and the location of the trading party.

There is also a major part, which is directly under the control of suppliers and buyers and their internal processes and whose improvement may not be outsourced.

Typically, 30% of larger companies still manage the invoices decentralised. Almost all of them use several ERP and accounting systems. This environment does not allow the financial manager the required transparency about the number, the total amount and the status of invoices.

Unfortunately, many sectors are still leaning on their suppliers to improve their working capital [19].

E-invoicing often results in a central outbound and inbound gateway, aggregating all invoices. This significantly increases transparency for finance managers and is a pre-requisite to optimise the working capital.

Suppliers of goods and services suffer from late payments. This is especially valid for SMEs. For that reason, they increasingly offer discounts to their clients. Despite these discounts, the effect is very limited and the payment period (e.g. 15 days to benefit from discounts) cannot be improved significantly.

The reason is primarily that many larger invoice recipients are just unable to process paper invoices faster than within 23-25 days.

A consulting customer of the author confirmed to have missed discounts with a value of EUR 1.50 per paper invoice. The discount benefits alone more than compensate the project costs and investments for the e-invoicing in this project!

An efficient workflow and archive solution is in most cases another result of an e-invoice project. This enables real-time monitoring of the invoice processing and permits an optimisation of the working capital.

3.4.1.4 Supply chain finance (SCF)

A dilemma currently exists between the challenges and opportunities.

Figure 27: Overview of challenges and opportunities around invoice payments

Challenges	Opportunities
• High proportion of overdue invoices • Uncollectable receivables	• Digitalisation and emerging technologies offering new approaches for master data management and improvement of invoice accuracy • PSD2 opens platforms for non-bank service providers • Instant or fast payments, and dynamic discounting • Converting invoices into cash: several SCF features available

Issues

According to the surveys of Atradius [20], the proportion of overdue B2B invoices in the Americas increased from an average of 48.8% in 2017 to 50.0% in 2018. In western Europe, it increased from 41% to 42%. In the Asia Pacific region, the proportion declined from an average of 45.4% to 44.5%. The surveys also cover the proportion of B2B sales made on credit: 41.3% in the Americas, 36.9% in western Europe and 43.6% in the Asia Pacific region.

There are a number of reasons for payment delays and credit sales:

1. Inaccurate invoice content
    - Incorrect information on invoices
    - Invoices sent to the incorrect person, branch or subsidiary
    - Violations of contract or tax compliance
2. Financial distress of customers
    - Insufficient availability of funds
    - Insolvency
3. Other reasons
    - Unwillingness to pay earlier and use of outstanding debts invoices as a form of financing
    - Disputes
    - Discrepancies between supplies and invoices
    - Inappropriate payment procedures and methods
    - Inefficiencies in the banking system

Solutions

The first issue regarding inaccurate invoice content can typically be solved by strict master data management, e-procurement, e-invoicing, data validation, matching and automation.

The latter two issues can be addressed with incentives for faster payments such as dynamic discounting and supply chain finance (SCF) instruments. Payment acceleration can also be promoted by governments.

Dynamic discounting is a process which allows buyers and sellers of commercial goods and services to dynamically change the payment terms – such as net 30 – to accelerated payment based on a sliding discount scale. Dynamic payables discounting is 'dynamic' in one or more ways. Dynamic discounting is also known as dynamic discount management, early payment discounting, or payables discounting.

It encourages suppliers to opt in for early payments. Dynamic discounting allows buyers and sellers to dynamically change the payment terms to accelerated payment based on a sliding discount scale. The buyer allocates a 'pool' of liquidity, determines liquidity limits, and establishes the interest rate for early payments. Once invoices are approved, the suppliers are automatically informed about new early-payment options. Through the portal, suppliers are able to view their approved invoices and trigger payments prior to the nominal due date, accepting the corresponding discounts.

The dynamic discounting functionality may be directly implemented as a Plug-In in the ERP or accounting application of suppliers and buyers. Another smart way is a 'Pay me early button' on the buyer's e-invoice portal (in case of direct exchange) or on the portal of the e-invoicing network operator.

Supply chain finance refers to the set of solutions available for financing specific goods and/or products as they move from origin to destination along the supply chain. It shall improve the Working Capital for suppliers and buyers. This is of special relevance during the challenging economy and the fact that an increasing number of trading parties is located abroad.

Some of the solutions that could be sold under the banner of SCF with relevance to e-invoicing include, but are not limited to:

- Asset-based lending, e.g. mortgage, factoring and reverse-factoring
- Receivables management services – Provides third-party outsourcing of receivables management and collections process. It also provides financing of those receivables and guarantees on the payment of those receivables.
- Dynamic payables discounting –Provides third-party outsourcing of the payables process and leverages a buyer's credit quality to obtain favourable financing rates for suppliers.

Suppliers are mainly interested in financing, guaranteed and early payments, whereas the focus on the buyer side is more on working capital / benefit of discounts etc. Providers should address both sides with suitable solutions and they should be appropriate for small businesses. It should also be possible to use it selectively on a case-by-case basis.

McKinsey estimated that the SCF market only covers around 10% of its full potential. There is still much potential to exploit, in particular in combination with electronic procurement and invoicing.

3.4.2 Automating the entire procurement process

In many countries, e-invoicing is much more visible on a broad scale than e-procurement. One reason for this is that e-invoicing was pushed by governments and tax authorities around the world as a top priority and e-procurement was mainly an issue of the private industry. According to Eurostat [21], 17% of all businesses with ten or more employees in the EU received at least 1% of its orders electronically in 2018, reflecting a stagnation compared to 2015.

Invoices are an important part of the entire procurement process. Many recurring invoices are the result of contracts without a termination date (e.g. leasing, phone, IT hosting, or maintenance). Several goods and services are ordered in a simplified form by phone, online, or by email. Formal and structured purchase orders (PO) in the proper sense are issued only in a small number of cases. Hence, we estimate that only 6-7% of all invoices are currently based on an existing PO.

Optimisation potential cannot therefore be fully exploited at present. One obstacle is also the fact that about 50% of purchasing and finance managers are internally organised in different reporting lines. They often have some autonomy regarding processes, systems and digitalisation.

However, we are now entering a new era. A pure focus on the early e-procurement processes or e-invoicing is no longer sufficient. On the one hand, previous users of e-invoicing are gradually evolving towards the automation of the entire order-to-cash and purchase-to-pay supply chain. On the other hand, previous users of the early e-procurement processes are increasingly expanding into e-invoicing. The overlap of the two topics is increasing and may finally result in a holistic, more integrated solution. This transition phase could be very challenging for most businesses and solution providers. Procurement managers will increasingly be required to actively participate in e-invoicing projects, which lay the foundations for exploiting the full savings potential of AR and AP automation.

Figure 28: The pivotal role of procurement managers in exploiting the full potential of automation

Issue	**Impact of procurement managers on invoice process automation**
Heterogeneous processes and systems for e-procurement and e-invoicing	• Holistic digitalisation and automation strategy
Supplier management and engagement	• Reducing fraud and identifying bad actors • Considering only the master data of tax-registered partners and increasing tax compliance • Streamlining and automating supplier interaction from onboarding to the processing of invoices and updating of master data
Contract and catalogue management	• Avoiding invoicing with incorrect amounts, ensuring accuracy of prices and compliance with synchronisations and data validations
Discount management	• Applying discounting models that can be reflected in business process automation solutions
Fake invoices, no or incomplete supply behind an invoice	• Establishing tax compliance processes, including evidence for supplies behind invoices
Purchase process	• Increasing the proportion of electronic orders and invoices • Automating the matching process
Evidence for tax compliance	• Storing the documents in a manner in which they can be retrieved in the same index for the entire process cycle

Procurement managers play a pivotal role for overcoming barriers and exploiting the potential of business process automation. With their experience as negotiators for reducing the total cost of purchases for all goods and services, they evolve towards holistic value managers. Business process automation forms a substantial part of this evolution. Hence, digital collaboration with internal line-of-business leaders and external stakeholders (suppliers and B2B exchange clouds) will become more important.

By 2025, we expect a much stronger integration and automation of procurement and invoicing processes. In Europe, this is also supported by public-sector initiatives.

3.4.3 Integrating electronic POS and mobile invoicing

The new POS and mobile invoicing model could catapult the electronic volume into new dimensions. Instead of inputting or scanning receipt data into AP systems, the data can be received electronically and processed automatically.

Volume capacity is considerably higher than for conventional invoices. Although this innovation is still mainly driven by tax authorities, end-users may finally recognise the huge savings potential, receive POS and mobile invoices electronically and automate AP processes for these documents as well.

3.4.4 Harmonising the automation of tax and business processes

The first level of evolution is simply a clearance model that mainly focuses on the data exchange between tax payers and authorities. Tax processes are digitised, but this does not automatically result in business process automation internally and in collaboration with trading partners.

This is due to several reasons:

- Once tax authorities take the first step, businesses expect the government to gradually initiate the next steps; this has a paralysing effect on internal and B2B automation with trading partners.
- In the first step, most countries require only suppliers of goods and perhaps also services to provide electronic data (asymmetric clearance model). Buyers are often not required to receive this data electronically and do not take any steps towards process automation.
- Businesses neither know the migration path nor the final destination of government intervention. Tax authorities prefer quick wins with additional tax revenues, but often do not strive to promote the benefits of business process automation for the economy.

In countries where clearance models are already advanced, it is crucial that buyers have the opportunity, or better the requirement, to receive structured electronic business data as provided by suppliers to the clearance model.

Countries with asymmetric clearance models are expected to evolve towards symmetric models, requiring buyers to also receive the data available. In a next step, suppliers and buyers may completely automate their business processes if the data available with the clearance model is appropriate.

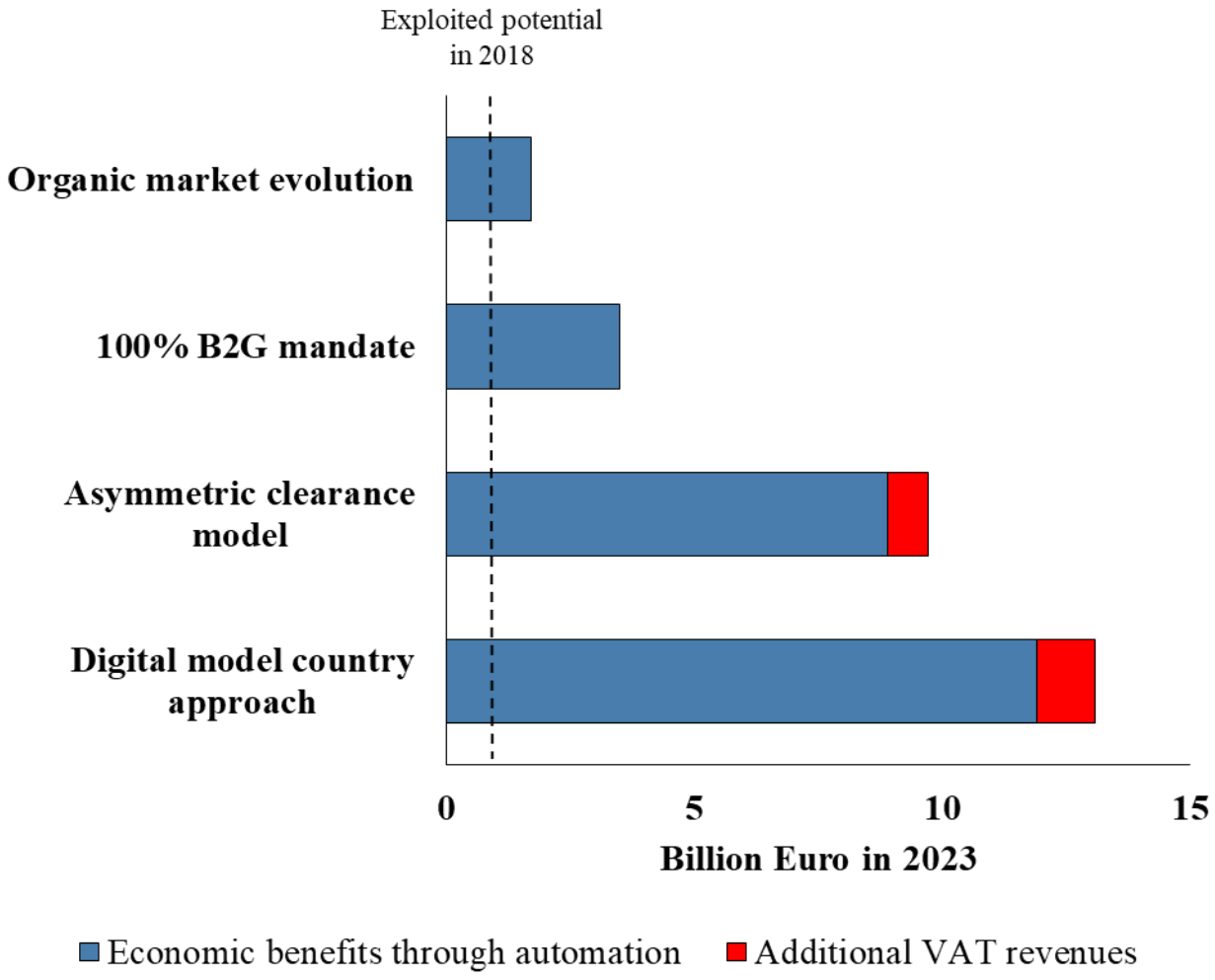
For countries that still do not utilise a clearance model, it would be very useful to follow the recommendations as described by the author in a separate document for Austria [22]. The study is in German, therefore a summary is provided here in English:

- Design the digital model country as part of a five-year strategy.
- Approve at the political level.
- Structure the model in building blocks.

- Communicate the structure and implementation timeline to the market.
- Specify the details of each building block in collaboration with private industry; one objective is to use messages that provide a good basis for tax reporting and simultaneously business process automation.
- Implement each module from the bottom-up in a well-coordinated manner with the other modules respectively in line with the overall model architecture.

The benefits for the economy could indeed be factors higher than what could be achieved via gradual evolution as seen with today's clearance models. The author calculated the following figures for the case of Austria:

Figure 29: Potential benefits for the economy and tax authorities in Austria



Compared to organic market evolution, a B2G mandate for e-invoices already provides a huge step forward. This is due to the fact that around 70% of all businesses with ten or more employees are suppliers to the public sector.

The asymmetric clearance model (mandates for suppliers only) with full-content invoices can already result in significant economic savings as shown above. This is because suppliers or their service providers transmit the electronic invoice data not only to the tax authorities, but voluntarily and in parallel to the buyer too. This allows some of the savings potential to be exploited. However, if countries only require an invoice extract of typically 10-30 data fields, there is almost no economic saving. Only the tax authorities would benefit from additional VAT revenues.

By 2025, a majority of countries around the globe may establish clearance models. They have the unique opportunity to benefit from the lessons learned in pioneering countries, to plan top-down in a holistic manner, to collaborate with the private industry at an early stage and to give the private sector sufficient time for implementing the model. If so, the economic benefits could be 3-11 times higher than the additional VAT revenues for the tax authorities.

3.5 Emerging technologies are changing the market

3.5.1 Current issues, and the need to act on the part of end-users and solution providers

In the invoice processing cycle, there is a high proportion of repetitive and time-consuming tasks – both for issuers and recipients. Nevertheless, almost 90% of all invoices worldwide are still processed manually. Although some invoices are scanned and key data is extracted, invoices are often exchanged electronically only. Invoice data is validated on the e-invoice exchange platforms and in some processing systems – mainly by invoice recipients. These tasks enable a reduction in the proportion of manual exception handlings, typically to a rate of 20% or slightly below. Some third-party service providers offer better values, but users complain that they have to pay high transaction fees. Many end-users would therefore prefer to bypass service providers altogether. In view of the drive towards cost-effectiveness by third-party providers, the ability to significantly reduce end-user prices is quite limited unless providers disrupt old business models. The market is thus searching for emerging technologies to solve these issues.

3.5.2 Blockchain: the next game changer?

In the 2017 Billentis Report, we stated that blockchain technology was still immature and in an initial hype cycle. The hype around this topic has meanwhile subsided somewhat, which we believe is a good signal for the next step in its evolution. Blockchain is in the early stages of adoption and it is becoming clearer where and how it can be used in practice.

Blockchain is used to solve problems that cannot be solved otherwise – or to solve problems significantly more effectively, cheaply and with less requirement for counterparty trust than is possible using other technologies and services.

Critical stakeholders still assume that none of these criteria are fulfilled. But these critics are inspiring the blockchain community to solve the pertinent issues. In addition, public trust in manufacturers, trading partners, transport and logistics companies, payment service providers, national banks and even governments is no longer as high as it was in the past. Another challenge is posed by growing international trade with a huge number of unknown intermediaries. Blockchain applications shift some of the trust in people and institutions towards trust in technology. In the future, people are likely to come to trust this new technology more than institutions.

Many proofs of concept and pilots have been performed so far.

The ideal applications for blockchain include the following scenarios in particular:

- Transactions involving many different parties
- Sequences of transactions/processes
- Tracking and tracing of goods
- Applications in which other processing solutions are time-consuming and costly
- Transactions in which security and integrity are important
- Transactions in which irrevocability is important
- Where trading parties prefer to exchange information on a peer-to-peer basis (bypassing the traditional intermediary service providers)
- Improving trust in products and trading parties

A classic use case is, for example, the tracking of goods from its origin to the customer. This may include diamonds, food, pharmaceuticals and other goods. Here it is important to identify the sender and verify the origin of goods. It also allows the routing of packages across multiple carriers and payments to be made for each step of delivery.

According to IPRdaily and incoPat, in 2017 China was the world leader for the number of patents in the field of blockchain. The creation of virtual citizen identification forms the foundation and focus of many other applications. Blockchain-based identification is also available using mobile apps. In China, blockchain will be widely deployed in the real economy and become an important pillar in the construction of digital China [23]. A specific example being tested in China is a blockchain-based tax invoice launched in the Shenzhen region.

A study [24] identified participants who are innovating in the present and are also optimistic about the future of blockchain. 92% of respondents viewed blockchain as an opportunity, with the four most promising use cases ranked as:

- Supply chain and IoT: 63%
- Legal and regulatory: 19%
- Cryptocurrency: 8%
- Sustainability: 3%

Across industries, respondents were optimistic on blockchain's future impact on a variety of business challenges:

- Improving corporate compliance: 96%
- Becoming the system of trust: 83%
- Replacing operational supply chain contracts in 5–10 years: 76%

Since the last Billentis report, another development has become visible. Some providers have developed operational systems and backbone platforms for practically applying blockchain technology. Others are offering blockchain app stores in a complementary manner.

Many major financial and technology organisations are exploring the benefits of blockchain, and some payment solutions based on the technology are already operational. Many e-invoicing and B2B network operators have also launched proofs of concept. But is the e-invoicing industry comparable to the payment industry? Or is blockchain in this area a short-lived fad? Is it a real game changer or something else?

Our conclusions:

- Good opportunity for value-added services related to e-invoicing, such as payments, trade financing, contract recording, pre- and post-processing of invoices on the supplier/buyer side that is subject to fewer legal requirements than e-invoicing, working capital optimisation, etc.
- Blockchain technology may also be relevant for new topics related to e-invoicing and hybrid models that combine blockchain components with other technologies, such as the tracking of shipments etc.
- Blockchain technology may have interesting prospects in legally liberal countries in North America, parts of Europe and the Asia Pacific region. It could be particularly appealing to new market participants.
- Opportunities may be limited in Latin American and Asian countries, which are already applying the clearance model. Service providers in these countries already have transaction prices in the low single-digit range measured in USD cents while using their current model; this is only slightly more expensive than public blockchain transaction fees. Lastly, their systems have already been tested in the field and are operational. Greater promise exists in countries that are currently in the process of planning and implementing clearance models or declaring e-invoicing mandates.

- It is unlikely that blockchain technology will have the capacity to substitute operational B2B networks and clearance models within the next five years. However, it could complement them using a hybrid approach.
- End-users will not switch to blockchain technology anytime soon for high-volume e-invoice exchange on a peer-to-peer basis. It is more likely that cloud operators will use this technology as a supplement to their existing services. End-users will be able to benefit indirectly.

3.5.3 Shift towards the cloud

The strategy and architecture of leading ERP providers are designed for a future in the cloud. Cloud services are paving the way for the use of AI, B2B data exchange and tax compliance services by businesses of any size. It will quickly be possible to gain access to resources at reasonable costs, which would otherwise not be affordable as in-house infrastructure.

Almost two thirds of European e-invoices are transmitted using cloud services, and the proportion is still rising. However, in some countries the proportion is still significantly lower; although this could rise to 70% by 2025. This is because cloud adoption provides a broad range of benefits [26]: lower and more elastic costs, agility, speed, change management, increased collaboration, competitive advantages and access to emerging technologies.

Gartner [25] predicts an increase in global public cloud service revenues from USD 145.3 billion in 2017 to USD 278.3 billion in 2021.

3.5.4 Robotic process automation

Academic studies [27][28] predict that robotic process automation (RPA) might start a new wave of efficiency gains. Oxford University [27] speculates that many jobs in the area of invoice processing may become automated by 2035, especially New Accounts Clerks, Data Entry Keyers, Order Clerks, Procurement Clerks, Claims Adjusters, Examiners and Investigators, Bookkeeping, Accounting, Auditing Clerks, Credit Authorizers, Checkers, Billing and Posting Clerks, Surveying and Mapping Technicians, Bill and Account Collectors, Accountants, and Auditors.

The common feature of all these positions is a high proportion of repetitive work in the area of invoice processing.

RPA solutions automate repetitive and rule-based processes, which are usually performed by humans. The tools or robots replicate the actions of a human, interacting with the user interface of a computer system. For example, entering data into an accounting system would be a typical activity for software robots. They are configured or 'trained' using demonstrative steps, rather than programmed using code-based instructions. Robots can login to relevant legacy systems (role-based directory authorization), and to work as virtual workforce. They are also able to collect data from various input sources, such as files or VAT business and public administration registers for master data synchronisation. They can interpret data, perform all the necessary validations, including crosschecking against other systems and messages, and feed this data into the target systems. When they encounter process exceptions, they can either rule them out or transfer them to a cognitive agent which will make a decision, update the system, and complete the process.

About 50% of manual back-office processes are expected to be substituted by RPA solutions in the coming years. Depending on their strategy, Business Process Outsourcing providers face both an opportunity and a threat.

The global RPA market is expected to achieve a size of USD 8.75 billion by 2024 [29], resulting in grow at a CAGR of over 60% from 2016 to 2024.

Implementation of RPA already brings significant benefits. Furthermore, it is fast to configure and to implement without disrupting the existing systems. It is appropriate for many of today's business processes that run according to rigid rules. Often, these processes involve highly repetitive work, such as processing invoices. Nevertheless, much of the remaining saving potential cannot be exploited only by using RPA.

3.5.5 Machine learning

Many organizations have to deal with judgement-based, complex processes and problem-solving. Consequently, cognitive robots are required. This is where artificial intelligence and machine learning as an application of it come into play. It is based around the idea that we should be able to give machines access to data, and let them learn for themselves. Machines learn directly from both structured and unstructured data, recognize patterns, and build their own business rules using learning algorithms. With this approach, business systems will reach a new level of intelligence and efficiency. Machines learn from what they have done in the past, improve performance based on experience, and are able to infer solutions.

Organizations may benefit from machine learning in numerous ways. They will be able to accelerate and optimize their business processes in general, and invoice processing in particular. Machine learning may simplify user interactions with devices, reduce human intervention, support fraud detection, forecasting liquidity, dynamic pricing, customer complaint resolution, trading partner scoring, and spend management.

An analyst [30] predicts that machine learning as a service market will grow from USD 0.9 Billion in 2016 to USD 16.4 Billion by the end of 2024, at a compound annual growth rate (CAGR) of 43.7% from 2016 to 2024.

3.5.6 The end of invoice scanning?

The development of RPA, ML and e-invoicing is making such rapid progress that all together might reduce the invoice scanning/OCR volume at least by 50% until 2025.

3.5.7 Advanced analytics

Businesses are steadily required to be more customer-focussed, to focus on key initiatives that lead to entering new markets, to create new business models, and to improve operational performance. These are key factors driving advanced analytics, big data, and business intelligence investments today. This also concerns the finance and procurement departments.

Dashboards and reports are quite often the first steps towards more transparency; however, advanced analytics goes far beyond this. Gartner estimates that the business intelligence and analytics market is mature for a multiyear shift from an IT-led, system-of-record reporting to a business-led, self-service analytics. The reasons for this positive shift are multi-layered. End-users and business networks have learned to use big data in an intelligent manner. This is strongly supported by models, algorithms, and solutions that have not been available in this form only five years ago. Last but not least, less expensive computer power helps to accelerate this trend.

The list of applications on offer is rapidly increasing, and includes a broad range of features, from basic to very advanced.

- Invoice content
    - Anomalies, e.g. items higher than the normal price, or price differences between identical products
    - Incorrect tax allocations
    - Tax compliance

  - Contract and policy compliance
- Real-time spend analysis
  - Intelligently classified with drill-down options
  - Price fluctuations
  - Real-time and historical price variance analysis
- Benchmarking, comparison with the industry average
  - Payment terms
  - DPO, DSO
  - Early payment discount rates
- Business trends and predictive analytics
- Detecting and avoiding fraudulent invoices

B2B networks for the financial supply chain operate using big amounts of data. They are in an excellent position to help end-users to apply advanced analytics in an efficient manner. Forbes predicts that cloud based big data and analytics market will grow 4.5x faster than spending for On-Premises Solutions.

According to an analyst [31], the global advanced analytics market is expected to grow at a CAGR of approximately 15% during the forecast period 2017-2023. It is expected to reach approximately USD 22 billion in 2023.

3.6 Transition of solutions and services

3.6.1 Paradigm shift in legal requirements and customer demand

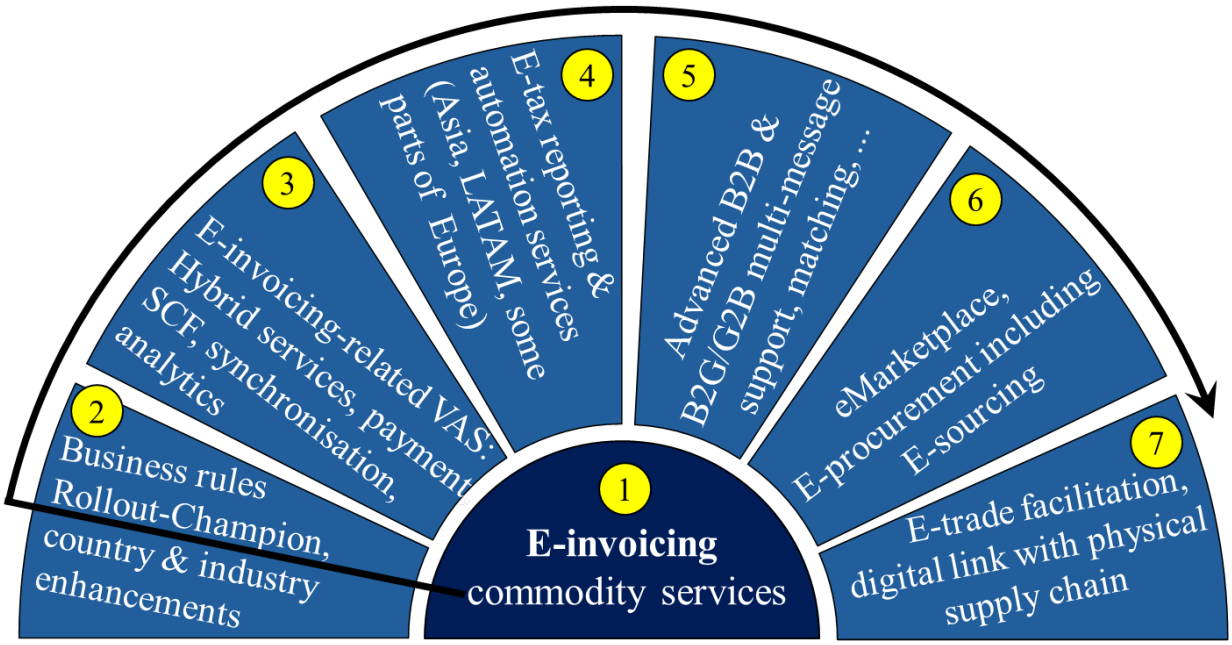
The ERPs of the first generation were designed rather to optimise the organisation of internal processes than collaboration with trading partners and tax authorities. Current ERP and B2B cloud systems have evolved following customer demand. Legal requirements have been limited for a long period, but this gradually changed about a decade ago. Solution providers have typically developed this additional functionality in a modular manner outside the core system. This also relates to the tight timeline for implementing new legal requirements and the numerous updates subsequently necessary. Meanwhile, it is quite clear that tax authorities are becoming very demanding around the world. They are increasing the requirements for the entire digitalisation of all tax-relevant documents and collaboration with tax authorities and trading partners. In other words, there is a paradigm shift with a significant impact on business solutions: hard requirements are coming from the legal side and soft requirements from the end-users. All solution providers have to support these hard requirements. Hence, functionality covering these legal requirements may become granularly embedded into the core system in the long term. It can no longer serve as differentiation from competitors. Whereas additional functionality covering the specific customer demand will become the USP.

3.6.2 Solution providers challenged by diversified demand

Even for larger businesses it is often too difficult to comply with the rapidly changing requirements using in-house solutions. Therefore, it is even more important to involve third-party solutions and service providers to support them through this transition phase.

Specialised solution providers are experienced in this area and they have the business focus to handle this level of complexity. Nevertheless, it is also quite challenging for them to support their customers through the transition phase. The competition between solution providers is now quite tough. Customer-oriented offerings and innovations are in demand more than ever. A suitable and affordable long-term strategy for managing future business may become a key issue for these service providers.

Figure 30: Future markets radar for service providers – future management



Phase	Description
1	The commodity service could include any-to-any data formatting, tax compliant e-invoice preparation (domestic and cross-border), transport/distribution and archiving. Cost leadership is required for being competitive in the future. Providers unable to increase the processed invoice volume above the market average growth should think about mergers with competitors for achieving the critical mass.
2	We expect that in the provider community the 'wheat will be separated from the chaff' based on the capacity to be a champion in these disciplines: Specific business rules are applied at least for validating the mandatory data fields in invoices. Data accuracy is a cornerstone for significantly reducing the costly exception handling of invoices. Electronic invoices can become the catalyst for this improvement. A few service providers have developed excellence to engage and onboard a high number of users in a short time. In just a few years, the most attractive market segments in advanced countries might be occupied. In today's globalized world it is no longer sufficient to support just the domestic requirements. Other country- and even industry-specific enhancements should also be supported.
3	Value added services (VAS) are increasingly an important differentiator to other competitors. In the spotlight today are hybrid services, instant payment features, any kind of supply chain financing & trade financing, dynamic discounting, data synchronisation services (master data, product data), analysis of invoice, processing and spend related data.
4	The tax authorities are increasingly demanding with regards to the reporting of any tax documents in electronic format. In the past this was often limited to general ledgers and VAT declarations. Increasingly taxpayers are also requested to send electronic data of audit files, invoices, credit notes, debit notes and even the payment receipt data produced by fiscal printers at the point of sales. Service providers mainly acting in Latin America, Asia, South and Eastern Europe are affected by this development. The IT and legal challenges for many taxpayers are too high and they prefer to involve a service provider doing this on behalf of them.

Phase	Description
5	A pure focus on processing solely electronic invoices is no longer sufficient. Meanwhile, more than 50% of service providers offer also support for other related business messages (e.g. orders, order confirmations, statements). In a first step they transport such documents in an electronic envelope. Leading providers offer advance services like content validation and matching between the different messages. The most popular services are currently the matching between orders, invoices and delivery notes.
6	Traditional electronic marketplaces grow increasingly into the business area of e-invoicing networks and vice-versa.
7	Exporters and importers process many cross-border invoices, but also a high number of customs, trade and transport documents. These additional trade documents have a high degree of overlap with the commercial and tax invoice. Tax authorities and auditors increasingly demand documents approving supplies and customs documents. The first e-invoicing network operators enter into this area in order to offer a full e-document service to their customers (full service for exporters and importers). This development is still in its early stage but might gain momentum until 2025. The next evolution step is already launched: The virtual and physical world are linked. A match between electronic documents of the financial supply chain and the tracking and tracing information of physical goods becomes reality.

3.6.3 Evolution in the potential solution architecture

It is unlikely that many solution providers will have the capacity to cover this broad functionality worldwide within a reasonable time frame. Instead, it is more probable that current players will evolve in the direction of cloud service brokers. In this role, they will aggregate cloud services and apps from various sources and create a new combined service for customers.

Existing and potential future legal requirements as well as real-time collaboration with tax authorities and between trading partners may represent a key pillar of the future solution architecture. Openness of platforms, interoperability and the support of emerging technologies such as RPA, ML, advanced analytics, IoT and blockchain constitute important components.

As the underlying service for e-invoicing may be completely regulated in the long run, competition among solution providers could become extremely challenging. Differentiation from competitors with only conventional e-invoicing may not be possible in this regard. It may therefore make sense to purchase this commodity service from others and instead focus on value-added services as well as functionality that satisfies customer demand.

3.6.4 Improvement from pure transactions towards measurable values

Before the turn of the century, there were less than 15 specialised e-invoicing service providers worldwide. In the early days, network operators were typically able to serve only their domestic markets in a tax compliant manner. Soon may the number of e-invoicing network operators reach 2000. Many of them are meanwhile required to support formatting wide range of data formats, and to process several business and fiscal messages in several countries. The fees the network operators charge to customers today typically include initial, time-based and transaction based fees. Usually, they charge these fees regardless if the customers get very accurate and structured invoice data, or data of poor quality. Fortunately, the progress done during the previous years is impressive. The geographic coverage of network operators is steadily increasing. The quality of services is also rapidly improving, and we benefit from an increasing number of value-added services. Nevertheless, this might not be sufficient in the future.

We can see first signs of a paradigm shift. Some providers, most of them based in the U.S., are addressing the market with a new approach. They do not only sell technology, or help with implementation and transactions; instead, they promise quantifiable added value. They promise to deliver customer solutions that will bring measurable improvements. This is particularly interesting for the automation of business processes and spend management.

Examples of quantifiable measures and outcomes:

- Amount of savings
- Proportion of straight-through invoice processing
- Proportion of exception handlings
- Proportion of tax compliant invoices
- Proportion of contract compliant invoices
- Number of trading partners that have been on boarded within a defined time-frame; guarantee for a certain proportion of e-invoices after a defined time period
- Exploited early payment discounts
- Benchmark against the best in class or industry average
- Reduction of fraudulent invoices
- Further measures around the invoice processing are for example developed by an U.S. expert [31].

Consequently, the target achievement is combined with a chance/risk sharing model between the provider and the customer.

End-users choosing a solution provider might increasingly consider measurable values as a selection criteria.

3.6.5 Need to change from a reactive to a proactive approach

3.6.5.1 Organisations with the aim to automate business processes

According to a study by MIT Sloan and Capgemini, only fifteen percent of CEOs are executing a digital strategy, even though ninety percent agree that the digital economy will impact their industry. This confirms the personal experience of us that a majority of organisations do not have a strategy to implement e-invoicing and to automate processes. Rather are they required by important trading partners or by the legislation to act. The result is typically a very heterogeneous solution, channel and format landscape. This is expensive to operate and maintain. It is in most cases also inappropriate to optimise all related processes in a holistic manner. This negative scenario can be avoided by defining a business and tax process automation strategy as soon as possible.

Below is a list of questions, organisations should ask before defining a strategy:

- What are our objectives and priorities?
- Do we do business in countries that now or soon practise the clearance model for invoices, receipts, other fiscal documents or tax reporting?
- Do we do business in countries that now or soon practise a B2G e-invoice mandate?
- How can I ensure the tax compliance in an international environment?
- Do we want to automate just the invoice processes, include the purchasing, the entire procurement and even the sourcing process?
- Is it our intention to start with the order-to-cash or purchase-to-pay automation?
- Which corporate units, systems and processes will be affected by the project and how can former solutions be migrated?
- How shall B2B networks and other cloud services be considered?

3.6.5.2 Solution providers

Today the solution vendors have an extremely strong tendency to develop and operate almost everything by themselves. After taking a look at the profitability of the solution provider community it is obvious that most providers do not have the financial capacity and resources to develop and process all future services by themselves. Comparison: The automotive industry today has a depth of manufacture of 20-25% and still tries to reduce it. Specialized partners do the rest. In the end we expect and recommend a similar development of the e-invoicing and e-procurement solution provider community.

Disruptive innovations should not only be considered by end-users, but also by solution and service providers. The market ultimately demands a highly holistic solution, exceeding the capability of most solution vendors. Segmentation into specific functions that are provided by specialists to other service providers could become a realistic scenario. Finally, the potential innovation models for service providers are comparable to those of end-users. Define a strategy for the next 3-5 years, scrutinize what to do inhouse, what to do via partnerships and what components to reuse out of the cloud.

3.7 Evolution of related terms

In countries with VAT systems, invoices can be seen as the most important of all business messages. Only with valid invoices can VAT be reclaimed and purchasing costs be considered in accounting. It was therefore a logical consequence that the terms ‘e-invoicing’ and ‘e-billing’ have become prevalent terms for a long period of time. Moreover, they have been supported by definitions in law. Many solution providers offered only functionality for this one type of business message, but are increasingly required to support other messages along the financial and physical supply chain. Messages for electronic tax reporting are directly related or, in the best case, they may be identical to the business messages. In a digitalised world, e-invoicing will represent just a fraction of a more holistic landscape. New terms will appear. Currently, however, it is not yet known which terms will be used for activities in the holistic automation of business and tax processes.

4. How to be successful with your project

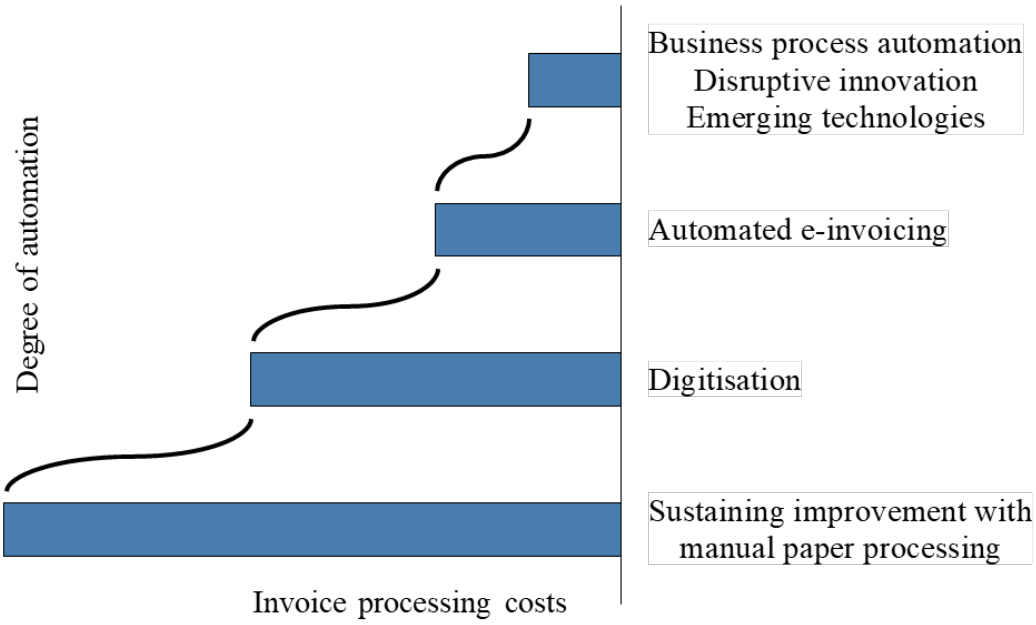
4.1 From gradual evolution to innovative business process automation

4.1.1 Evolution steps

Remark: In order to simplify the description, we focus on the invoice recipient side in this chapter. The steps for improvement are accordingly also valid for the invoice issuer side.

Organisations typically follow an evolutionary path and gradually improve their processes in 10-20% steps. Substantial savings are possible with this approach. Besides the introduction of these classic steps in this chapter, we will also encourage the readers to assess a more revolutionary model for business process automation based on disruptive innovation with the aim to improve to 90%.

Figure 31: From gradual evolution to innovative business process automation



4.1.2 Sustaining improvement with manual paper processing

In most organisations, conventional paper processing is not optimised. Invoices are often received decentrally by many departments. Cash managers do not have an overview of all invoices in the workflow and therefore only have limited opportunities to improve the working capital.

A first step of improvement is to centralise inbound invoices. From the very beginning, they can be processed more efficiently in a shared service centre. Offshoring such shared service centres can again reduce the processing costs substantially.

Nevertheless, the classic shortcomings caused by the paper format remain, such as:

- The accuracy of the invoice content remains a problem; typically 20-30% of all invoices have to be treated as exceptions in one form or another, resulting in very high processing costs.
- The data are validated and matched with related documents manually; this is time-consuming and costly. Delayed payments are often caused as invoice errors are detected very late during the processing cycle. Potential discounts are missed and the DPO stays too long.
- The master data have to be updated manually, resulting in high trading partner administration costs.

- For archiving paper invoices, a great deal of space is required. It is also costly to retrieve paper invoices in the event of audits or queries.
- The demand of trading partners for an electronic channel is not satisfied.
- Last but not least, paper invoices are harmful to the environment.

4.1.3 Digitisation

Digitisation is a huge step forward. Currently, two methods are in the foreground:

- Paper scan and capture
- Image-based PDF invoices

Digitisation requires organisations to establish invoice workflow and archiving solutions. As a consequence of this improvement, many disadvantages of conventional paper processing disappear, but several still remain:

- The accuracy of the invoice content remains a problem; typically 20-30% of all invoices have to be treated as exceptions in one form or another, resulting in very high processing costs.
- The master data can be updated on a semi-automatic basis, but the risk of redundancies of master data with minor differences could increase.
- The demand of trading partners for an electronic channel is not, or not fully, satisfied.
- Last but not least, paper invoices are harmful to the environment.

Image-based PDF invoices are for many organisations a first step towards paperless invoices. Invoice issuers favour these as they have an immediate positive impact on costs. Larger invoice receivers are more sceptical towards exclusively image-based digital invoices. Nevertheless, it is even an improvement for them compared to paper invoices. Transport is much faster. They have access to a quick, digital channel for feedback and rejects. For internal processing, recipients can feed the PDF invoices into the scan and capture process. The resulting data quality of this is slightly better than with paper invoices.

4.1.4 Improve the data accuracy of tax-relevant documents

4.1.4.1 Analysis of challenges

Recipients particularly understand the problems of poor data quality in invoices. This starts with differences in the master data and other data fields mandatorily required by the tax legislation. Inaccurate invoice data result in expensive exception handling and payment delays.

As many businesses optimise taxes through illegal and legal methods, tax compliance is increasingly put into the spotlight. The OECD and G20 countries agreed to increase the requirements for reporting and the tax compliance of any business documents. The Panama papers scandal might further strengthen and accelerate this trend. Businesses have to provide more precise evidence that trading partners really exist and that business documents are based on a supply of goods or services. The current accuracy of invoices and related business documents may no longer be sufficient.

Invoice issuers and recipients also have tremendous costs associated with inaccurate invoices. This is well reflected in a survey. Atradius [20] analysed the main reasons for payment delays by domestic B2B customers. Incorrect information on invoices was the reason for 21.2% of these delays in Asia Pacific, 16.5% in the Americas and 14.7% in Western Europe.

Higher invoicing accuracy can be achieved by improving the address data of issuers and recipients, and all data related to the underlying supplies (goods and services).

Phantom trading partners (fictitious corporate entities), supplies (never delivered) and fraudulent invoices are also a main reason for AP fraud.

Many of these challenges can be overcome with an appropriate measure to improve data accuracy and validate the data on a real-time or near-real-time basis. Using artificial intelligence features open up new possibilities to detect fraudulent invoices. E-invoicing based on accurate data lays an excellent foundation to this end.

4.1.4.2 Accurate addresses and master data

Tax compliance requires that both trading partners really exist, and that their addresses are correct and in line with the entry in the business register.

Digital certificates can be one tool that may be used to unequivocally identify trading parties, at least on the technical authentication level. They are already in use in some countries with this objective. However, this unique identification does not necessarily guarantee that the issuer and recipient addresses on the invoice will correspond. This can rather be ensured by a synchronisation of the master data with accredited registers. Such accredited directories may be the national business registers. In addition, public sector registers – including the public administrations/agencies on all federal levels – may be established and maintained. The data of these directories are sometimes not yet fully public, mainly for privacy reasons. If this is the case, the legislation can be changed to pave the way for easy online access to them. For practical reasons, registers are required to support a number of specifications regarding hierarchies such as for headquarters and branches, subsidiaries etc. If these prerequisites are fulfilled, the market participants can use lookup routines to dynamically synchronise key parts of their master data in their ERP solutions or respectively the user directories of e-invoicing network operators.

Direct data synchronisation between the systems of trading parties will still play an important role in many high volume industries, but might in the medium term be complemented or replaced by synchronisations with national registries.

4.1.4.3 Accurate product and service information

Due to compliance requirements, businesses have to provide the evidence that business documents are based on a supply of goods or services. Tax optimisation by over-invoicing (fraudulently increasing the price of a good or service) or under-invoicing (decreasing the prices) shall thereby be avoided.

Businesses also have their own interests in accurate goods or service descriptions in invoices. For standard or mass goods and services, especially in regulated market segments, such data can be synchronised with a central data base. One example is TARMED, the tariff structure in the Swiss healthcare industry. The supplies in the invoices are matched with these standardised data. Most businesses are operating in a less standardised environment. For them, good options for increasing the accuracy of such invoice data are also available. Integrated purchase-to-pay solutions are leading to catalogue data matching.

The GS1 organization promotes GDSN (global data synchronization network), which enables trading partners to share product data globally.

The Mexican SAT classified goods and services, following the United Nations Standard Products and Services Code (UNSPSC) taxonomy. This paved the way to use it for e-invoicing since December 2017.

We expect that data synchronisation services will play an increasingly important role in the future. However, at present most organisations prefer to issue orders predominantly by electronic means, and to receive e-invoices. In many cases, the content of these two documents can be automatically matched.

4.1.5 Automated e-invoicing

The legislation in many countries considers paperless invoices in any electronic format to be e-invoices. This includes structured electronic invoices as well as image-based PDFs. Depending on the country, up to 50% of all businesses use office programs to generate invoices. They often neither have AR nor AP modules for their accounting. Many of them have outsourced invoice-related processes to third parties. For this group of users, it is challenging to practically automate e-invoicing processes. For most others, however, a key objective is to fully automate these processes. Terms like 'touchless e-invoicing', 'zero touch e-invoicing', 'true e-invoicing' or 'automated e-invoicing' are used in this connection.

Suppliers and buyers use structured invoice data and typically establish direct two-way communication or increasingly use a service provider for the bilateral exchange. This results in many benefits.

E-invoicing is typically practiced in a centralised manner for all outbound and inbound invoices. This results in increased transparency and builds an excellent basis for the optimisation of cash management.

A major shortcoming of any paper and digital image-based approach is that the accuracy of invoice data is not guaranteed. With the appropriate approach, this problem can immediately be eliminated or at least reduced. The unique identification of trading partners based on compliant master data is a prerequisite and becomes the norm for automated e-invoicing.

True e-invoicing paves the way for real-time or near-real-time data validation. The earlier an incorrect invoice is rejected, the sooner a new one can be sent. As a result of the improved invoice accuracy, the approval and processing time can be reduced significantly. The DSO can in most cases be shortened by several days[3].

Dispute handling can be conducted in a more structured way by using the same electronic communication channel. As a result of the increased electronic interaction, the trading partner administration costs can be reduced substantially.

Compared to conventional paper invoice processing, the automated e-invoicing will result in cost savings of 60-80% in most cases.

Structured e-invoices build a good starting basis for value-added services and the easier implementation of trade financing services.

4.2 From the scratch to the rollout

4.2.1 Define the best scope for your organisation

Many organisations already exchange some electronic messages along the supply chain with their counterparts. For them, e-invoicing is just an enhancement and a next step towards automating the whole supply chain.

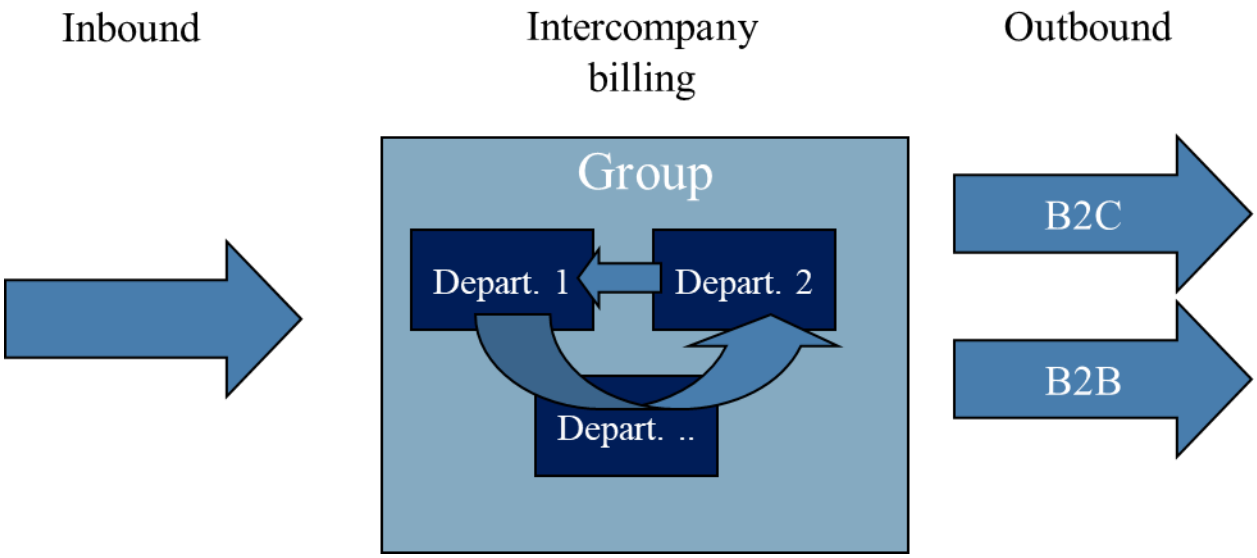
[3] A survey in Germany confirmed 5.4 days for example.

For a vast majority, e-invoicing is the first step towards the electronic supply chain. That is why many organisations start with the 'queen of all messages'. In most cases, it is a good approach starting with 'just' the invoice message and aggressively increases the electronic share within your environment. E-invoicing alone will already be an interesting business case! However, more future savings are possible with a fully automated supply chain.

In mid-term planning the next optimisation steps to take should be considered: Either in the pre- or post-processing of the electronic invoice.

Some invoice streams are more dominant and provide higher optimisation potential. We believe that projects should follow that potential.

Figure 32: Priorities of invoice streams



Inbound

Organisations in a strong buying position may decide to replace inbound invoices first, as they are in a strong position to push their suppliers to deliver invoices in electronic format.

Intercompany billing

Volume and optimisation potential is quite often under-estimated. It is the only invoice stream fully under the control of each organisation. In one scenario, these invoices can quite easily be processed electronically or via account transfer. This is the case if all departments, branches or subsidiaries belong to the same tax entity in the same country. Wherever that is not the case, it can make sense to handle internal electronic invoices as for the external ones, with identical methods guaranteeing authenticity, integrity and legibility.

Outbound

High volume organisations in the B2C sector already provide electronic bills to consumers with direct models. However, the success is limited in most cases. If 50% of clients are using it, it is already a good value. Most send electronic bills just to 35-50% with best in class to 75-95%.

To increase the electronic share, an opt-out rollout model (as defined in figure 39) should be practised and/or networks should be distributed (e.g. online-banks or other favourite portals of consumers). Delivery of PDF invoices via email or portal has become very popular in many

countries. However, many large billers made a more significant step forward by practising the push method rather than a portal based approach. The same is true for B2B invoices for small businesses. In this case, the PDF invoices are ideally much more than just a paper replica. Instead, the PDF files can include – alongside the invoice image – also a layer with structured (XML) data and the ability to include forms and components for dynamic interaction such as dispute, payment etc. e-invoices are prepared in a VAT compliant manner by the issuer (digital signature for at least relevant parts of the PDF container, verification and sometimes with long-term online archiving).

4.2.2 Know your environment

In many projects in larger organisations, it was interesting for the author to see the heterogeneity of customer environments, e.g.:

- High number of different ERP systems
- Decentralised issuing and/or receiving of invoices
- No control and overview regarding paper invoices in the workflow
- No transparency concerning all the invoice streams, volume and the different ways in which they are processed
- Various decentralised long-term archives
- Unclear as to which document is the invoice original and which is a copy
- Parallel and isolated projects in different departments for scanning, workflow, archiving, tax compliance and e-invoicing

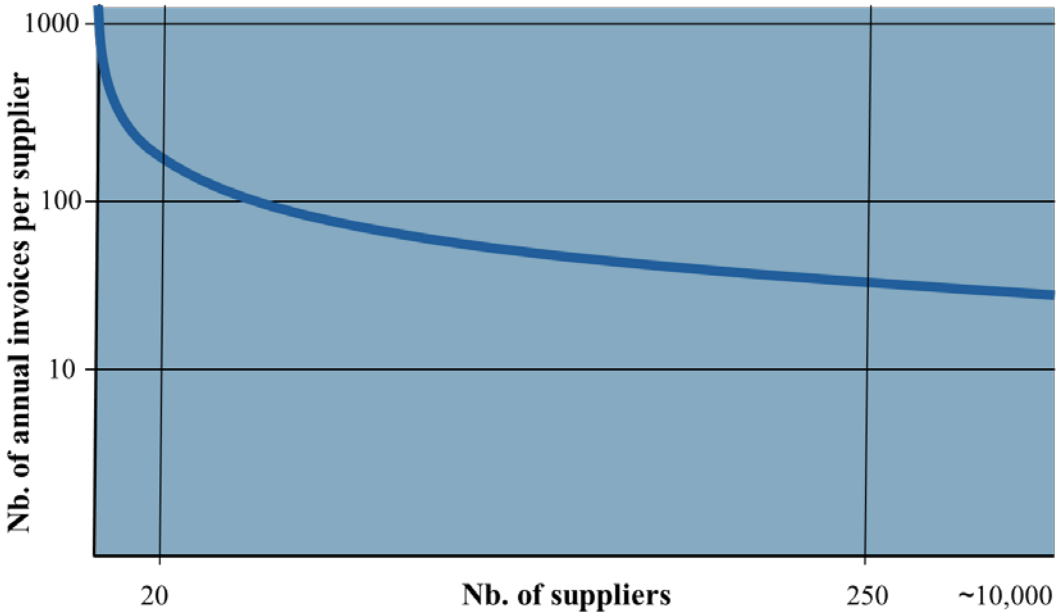
An efficient workflow and archive solution is in most cases another result of an e-invoice project. Cleansing of redundant and inaccurate master data before going into operation is strongly recommended.

If the reader is working in a large organisation, it is helpful to clarify the points above and summarise the current environment and the mid-term target environment.

4.2.3 Know the capabilities & constraints of your trading partner

Although valid in many sectors of our environment, the 80:20 rule is not applicable regarding invoice streams, except in very few industries. The pattern below for inbound invoices in a mid-sized or larger organization is much more likely.

Figure 33: Pattern for inbound invoices



The number of suppliers sending more than 100 invoices per year is quite often just among 20-50. Perhaps another 1,000 send 10-100 annual invoices and the vast majority send less than 10 annual invoices. Large organizations have typically 10,000 suppliers and depending on the product n0,000 customers. The vast majority of suppliers and customers are SMEs with highly fragmented IT landscape and limited capability for import/export of structured invoice content and electronic archiving. In addition, these counterparties can be located in various countries with different legal constraints regarding tax compliant invoices, archiving, language and cultural behaviour.

E-invoicing projects can just be successful, if the situation of trading partners is strongly considered in the project. This includes also thinking about what the incentives for them are and how they can easily be connected in a VAT compliant manner.

Whereas large issuers and recipients fully integrate electronic invoice processing into their environment, the requirements of mid-sized and small enterprises can be different.

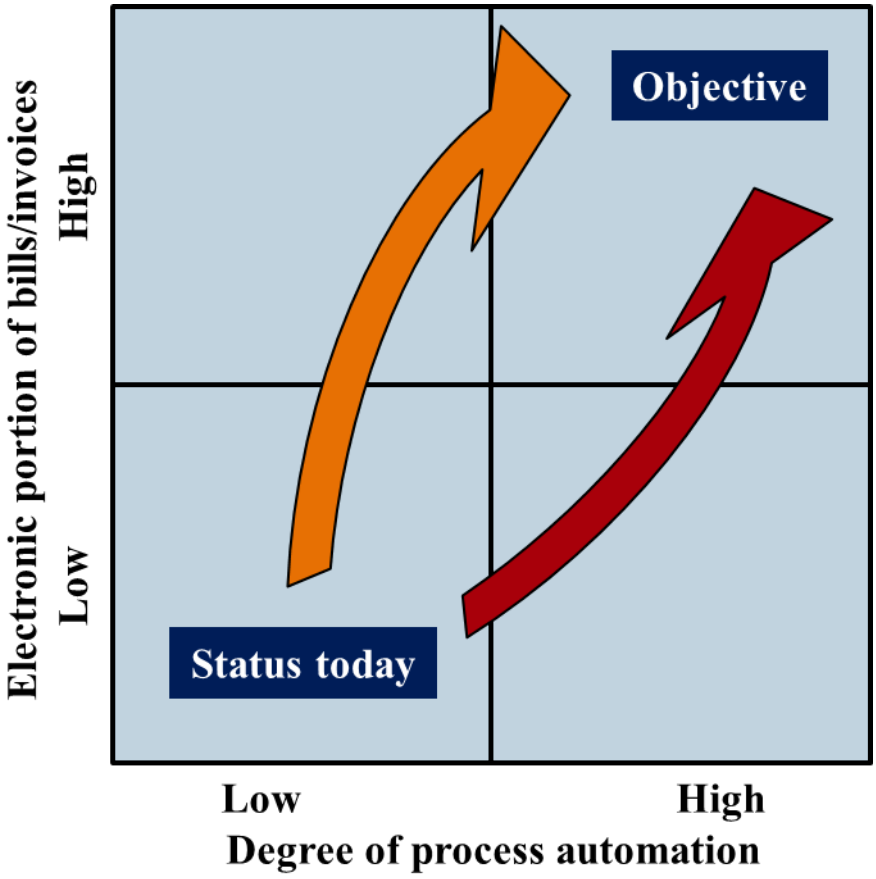
Figure 34: Requirements of organisations

Size	Issuer requirements	Recipient requirements
Large	• Full ERP integration • Two-way communication • Cloud archive (sometimes shifted to inhouse in step 2)	• Full ERP integration • Two-way communication • Cloud archive (sometimes shifted to inhouse in step 2)
Medium	• Full ERP integration • Export tools (CSV, ...) • Cloud archive	• Full ERP integration • Import tools (CSV, ...) • Cloud archive
Small	• Printer Driver • WebEDI (type in invoice on a portal) • Electronic forms • PDF (including several layers with image, XML data and other features) • Cloud archive	• Browser presentation & download, e.g. via home banking • PDF (including several layers with image, XML data and other features) • Cloud archive

4.2.4 Choose the appropriate migration strategy

This chapter focuses on the migration path options.

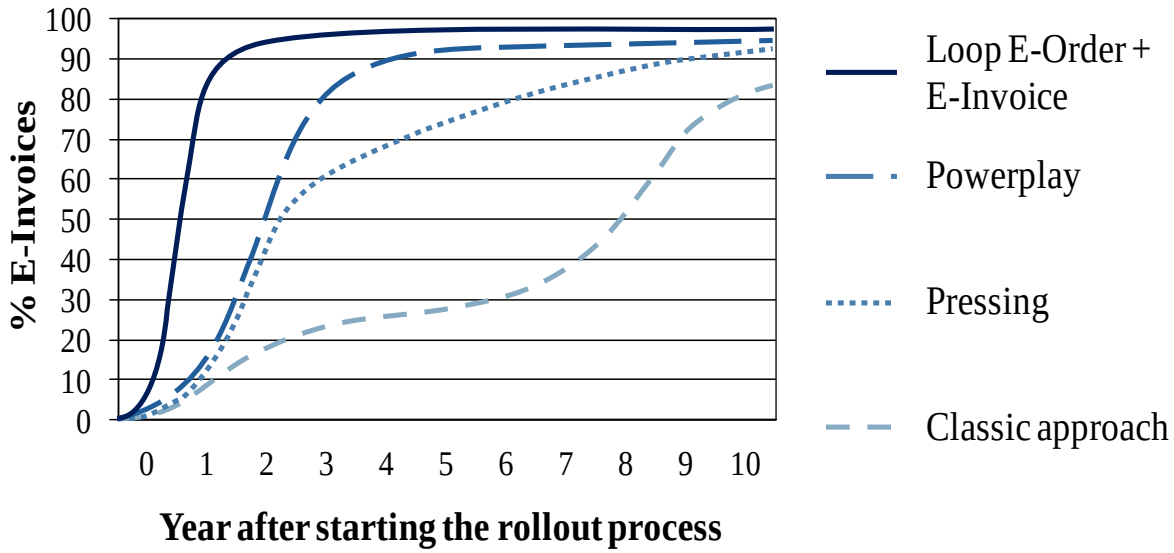
Figure 35: Migration path to exploit the full optimization potential



4.2.4.1 Increase electronic proportion

By monitoring the international markets for more than 20 years, we analysed the differing developments in organizations. The success rates and electronic proportions differ greatly.

Figure 36: Success rate dependant on practiced on-boarding methods



Phase	Description
Classic approach	Mainly large companies are innovators for e-invoicing. They push their larger trading partners to send and receive the invoices electronically. The Opt-In on-boarding method is practiced (convince one by one to enter into the electronic community). For the vast majority of organisations, the achievable share of e-invoices with large trading partners is just 25-30% after several years. In a next step, the large innovators also try to push their mid-sized and small trading partners to support electronic invoices. Even by increasing the marketing activities, a large organization does not have the power to make the market alone. They are dependent on the maturity of the mass market. The annual growth rates are limited. This market evolution was common in the past and is still in progress today in many countries. It did not cause a broad break-through in the markets up to today.
Pressing	For most large companies, it is possible to achieve an electronic invoice share of at least 60% after 3 years. This will not happen automatically with a smart and friendly approach towards trading partners. Instead, pressing and marketing is necessary for increasing the share of e-invoices. In addition, the general contract terms should be enhanced to provide the contractual instrument to force trading partners towards e-invoicing. Although the rollout is strongly based on pressing, this is still a fair method if the promoter or its service provider offers appropriate solutions for any kind and size of trading partner and for fair conditions. Registration and usage barriers shall be as low as possible. This can happen, for example, by taking the first step using only the internet. An account shall be pre-defined for each trading party

Phase	Description
	and can be activated with just a click of the mouse, followed by completing the user's master data. An increasing number of large companies are practicing this method.
Powerplay	For most large companies, it is also possible to achieve an electronic invoice share of at least 80% after 3 years. The 'Pressing' method is enriched with penalties for counterparts which insist on paper invoices. Electronic invoice exchange is declared as the default channel, but penalties are applied for paper invoices: • Suppliers charge typically EUR 1 – 3.50 to consumers and EUR 5 – 25 to companies per paper invoice • Buyers reduce the paid invoice amount typically by EUR 15 – 25 per paper invoice if the suppliers are not willing or not able to send the invoices electronically
Closed electronic loop for orders and invoices	In many large companies, at least 40% of the invoices are based on Purchase Orders. Enterprises have the chance to receive all PO-based invoices electronically within just a few months. Suppliers are keen to get purchase orders. If they only get the chance to receive them electronically in the future, they will accept the new channel rapidly. In addition, they also have the chance to return invoices electronically. This model results in a quick win-win situation for suppliers and buyers.

Considering these known facts, it is surprising that many organizations do not switch to more promising on-boarding methods.

4.2.4.2 Enhance the degree of process optimization

Today a major bulk of electronic invoices is just digital images of paper. This is not really a surprise, as people are familiar with PDFs and the barriers to start with are quite low. However, the benefits are mainly on the supplier side and buyers are keen to move towards the next steps.

Improvements, which can be noticed on the market

- Machine created PDF invoices → read the document text straight from the PDF without the use of OCR
- PDF Images → Intelligent PDFs including images + structured invoice data (+ interactive components, digital signatures, logfiles, workflow functionality); PDF invoice becomes interpretable by both humans and computer systems

Any development as mentioned above helps to increase the degree of automation on the recipient's side as well. The weak economy might accelerate the next evolutionary step towards fully automated processes and to tap the full potential in the mid-term.

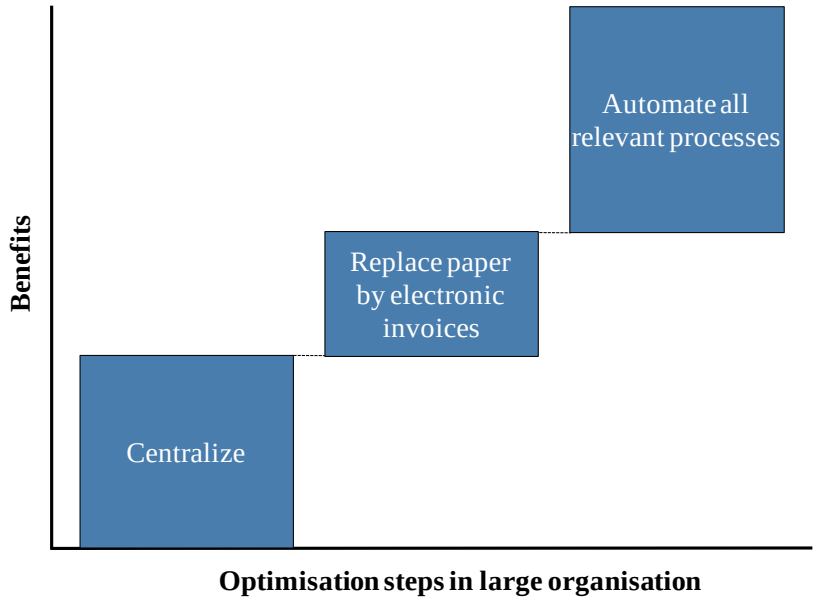
4.2.5 Scenario for internal implementation

Typically, 30% of larger companies still manage the invoices decentralised. Almost all of them use several ERP and accounting systems. This environment does not allow the financial manager the required transparency about the number, the total amount and the status of invoices.

E-invoicing often results in a central outbound and inbound gateway, aggregating all invoices. This significantly increases transparency for finance managers and is a pre-requisite to optimise the working capital.

In a fragmented and large environment, the highest benefits can be achieved by following these steps.

Figure 37: Optimisation steps and benefits



As this objective can be (too) time consuming (e.g. 2 years) a good alternative is migration within a decentralised environment. If the constraints of future centralisation are already known, they can be considered in the planning and implementation of systems and processes.

Improve to electronic and automated processes is generally a good step. However, in most organisations, it may be advisable to critically scrutinize and streamline first all the processes. Often, 30% of historic burdens can be removed without loosing anything.

4.2.6 Potential involvement of third party solution providers

Complete in-house developments are no longer a realistic option

- No chance for a good business case due to high project/development costs and very high follow-up costs
- Too time consuming
- No reason to re-invent solutions which are already offered by hundreds of solution providers and which are up-and-running already in other companies

Therefore, the real alternatives are purchasing third-party applications or using external cloud services.

Figure 38: Third-party services and applications

Services	Applications/Solutions
• SaaS (Software as a Service) • PaaS (Platform as a Service)	• e-billing/e-invoicing applications for automated or semi-automated issuing and

Services	Applications/Solutions

• E-invoicing network service (single-point-of-contact; any-to-any connection)
• Any-to-any data formatting
• Rule based data validation
• VAT tax compliance service
• Invoice management service (including digitalisation and data capture of remaining paper invoices)
• E-Procurement, E-Marketplace
• Archiving Service
• Supply chain finance
• Advanced analytics
• Electronic tax reporting
• Others
	receiving electronic invoices, including handling of various output/input formats
	• Signature software or devices, Public Key Infrastructure (PKI); Signature verification tools and portals
	• Invoice cockpit (monitor all invoices circulating within an organisation)
	• Invoice management
	• Workflow
	• E-Procurement
	• Interface software
	  o data conversion and mapping tools
	  o printer driver with e-invoice transfer features
	• Archive

The scenario chosen from the above will depend on

- Make or Buy policy of each organisation
- Own IT and processing environment
- Invoice volume
- Business Case
- Internal requirements
- Requirements and capabilities of counterparts

Larger organisations quite often analyse 2-3 scenarios, compare them and decide on one of them. This step is then followed by a Request for Proposal (RFP), sent to 2-4 providers.

4.2.7 Compliant rollout model for your counterparts

Technique is just a small part of an e-invoicing project. Much more important for the success and a high electronic share is the rollout strategy (on boarding of trading partner).

Figure 39: Different rollout models in use

Opt-In	An issuer or recipient upgrades his environment for electronic invoice processing. He informs his counterparts about this new opportunity and invites them to send and/or receive invoices electronically. Each participant has to be persuaded to change to electronic invoicing. This can be done with strong arguments, incentives and/or slight pressure. The traditional and friendly method of taking companies on board was used in the past, but is more often replaced by the Opt-Out model where possible.
Opt-Out	An issuer or recipient upgrades his environment for electronic invoice processing. He informs his counterparts about this new opportunity and explains that after a certain deadline, invoices will only be exchanged electronically. If anybody wants to 'opt-out', they have to give notice. In many cases, it means also a (penalty) fee for keeping to paper based invoices. The Opt-Out model results in very quick results and a high electronic invoice volume. It can be practised by any larger organisation, but is mainly at the forefront for organisations in a steady interaction with a stable base of counterparts (e.g.

	Leasing companies, transport & logistics, telecom, utility, credit & customer cards, office material, suppliers of MRO articles and customer packaged goods, online services and any communities using extranets or standard client software). Today's issuers who use this model quite often use signed PDF invoices with or without additional XML data. This guarantees immediate readability by the recipient, although the benefits for them can be quite limited in the case of PDFs.

Figure 40: Success rate for an organisation and the electronic proportion one year after launch

Model	Electronic proportion of all invoices
Issuer driven 'Opt-In'	1-5% with free market range 5-50% within existing supplier-buyer networks
Issuer driven 'Opt-Out'	85-90%
Recipient driven 'Opt-In'	1-5% for organisations without much purchasing power 50-70% for organisations in strong purchasing position
Recipient driven 'Opt-Out'	Up to 90% for organisations in strong purchasing position and providing electronic orders

The majority of businesses do not have an ideal environment for using an Opt-Out approach. However, the model should be tailored to its practicability for each environment. Certainly, it will be practised eventually by some of your counterparts, with a direct impact on your situation.

4.2.8 Potential barriers and how to overcome them

The barriers differ greatly for enterprises in various countries and depending on the company size.

Figure 41: Main barriers in many European countries

Barriers (European mass market)	Possible actions to overcome them
Legal requirements are unknown or confusing	The multi-stakeholder fora and/or federal administrations are privileged to actively provide appropriate information to the mass market. Some of them organize information events & road-shows or engage evangelists. Many others (e.g. Austria, Belgium, Germany, Switzerland, United Kingdom) operate an information portal with the most important information.
Missing market transparency about the solutions offered and the collaboration among various service providers	The multi-stakeholder fora and/or federal administrations are privileged to actively provide appropriate information to the mass market. Some of them already provide a broad overview on information portals. The best-in-class offers segment specific information (small company selects 'I am a small biller' or 'I am a small invoice recipient' etc. and guide the visitor through an interactive dialogue to provide exactly the appropriate information (lean).
Change/adoption of internal organisation processes (40% of larger organisations)	It is human nature that old habits die hard. This is especially valid if very numerous departments are affected by

Barriers (European mass market)	Possible actions to overcome them
	a project and have to change. Management attention and decisions are required.
Divergent requirements of trading partners regarding formats, methods and processes	As this is especially painful in case of bilateral (direct) exchange of structured electronic invoices, using standards can help. E-invoicing network operators are also capable of significantly reducing the complexity for end-users.
Not recognizing the business case	Almost 100% of Italian businesses exchange invoices electronically. In other countries, the adoption rate is about 90%. Can they be wrong? The focus is changing, see remarks in chapter 4.3.2.
Trading partner does not support the electronic invoice	Viewed statistically, there is a relatively high chance that your trading partner already supports e-invoicing. It could more likely be a lack of information. Some federal administrations, multi-stakeholder for a or provider associations already maintain public user directories. Besides increasing transparency, often the trading partners just need inspiration to do it now and some guidance on how to do it.
Task sharing for accounting and invoice processing with external parties (trustee, tax consultant, commercial auditor, etc.); is in some countries practised by up to 50% of (smaller) enterprises.	Third party service providers have fears of or limited interest in substituting labour-intensive (paper based) work with efficient, electronic and automated processes. It could be a major task for multi-stakeholder to clarify and show the risk of resistance to the opportunities of new electronic methods.

Figure 42: Main barriers for mid-sized and larger US companies

Barriers (mid-sized and larger US companies)	Possible actions overcome them
Lack of budget	In-house developments cause high initial and follow-up costs. Field-tested applications and services from third parties are typically significantly cheaper. If services on demand or SaaS are preferred, the initial investments are moderate.
Belief that there will not be an ROI	Publicly available calculation tools / ROI calculators will probably show the reader within 5 minutes that there definitely will be a good ROI.
Lack of understanding of current available solutions	Some market analysts make the market more transparent with their publications and events. Solution providers are encouraged to make great market communications.
Lack of resources to manage automation	Shift e-invoicing to the enterprise's number 1 priority.
Supplier resistance	Do not attempt to press all suppliers into the same scheme and require just one certain data format follow-

Barriers (mid-sized and larger US companies)	Possible actions overcome them
	ing your business process. The capabilities and requirements of suppliers differ greatly. If invoice recipients (or the e-invoicing network operators involved) support various invoice formats, any-to-any data formatting and benefits (e.g. trade finance, early payments), acceptance by suppliers can significantly increase.
Current processes work	Complacency is a risk. It is likely that competitors are already implementing e-invoicing, reducing the invoice processing costs and achieving a competitive advantage.

4.2.9 Roadmap

Small organizations can technically become up-and running within just a few days. More time consuming will be the on-boarding of the counterparties.

In large organizations, the project and implementation time can strongly vary, depending on existing environment and degree of integration.

Figure 43: Indication for project and implementation time

Scenario	Centralised, homogeneous environment	Decentralised, heterogeneous environment
Key-in/upload invoices via third party Web portal or printer driver Receive/download invoices via third party Web portal Archive operated by third party	0.1 – 1 days	1 month
Invoice export/import via AR/AP application Archive operated by third party	0.5 – 2 weeks	3 months
Scenario above including analysis, re-design, workflow and archive implementation	6 months	1 – 1.5 years
Scenario above, including integration of invoices with related messages along the supply chain (order, delivery notes, payment, remittance etc.)	up to 1 year	up to 2 years

Countries that declared B2B mandates proved, that all businesses can be migrated within one year. This happened for example in Italy and several Latin American countries.

4.2.10 Project checklist

Define the role of e-invoicing as part of the corporate digital strategy.

Analysis

- Internal
    - Involved and related processes, systems and divisions/branches/subsidiaries
    - Invoice streams
    - Old burdens from the paper world to be removed, disrupt, reengineer
    - Obstacles and how to solve them

    - Structure, capability and legal constraints (especially in multi-national companies)
- Of your counterparts
    - Volume
    - Technical capability
    - Willingness to adopt
    - Legal framework
- Strategic focus and priorities

Concept
- Solution scenarios
- Decision Make or Buy
- Step-by-Step approach (division by division) or 'big-bang' (company-wide project)
- Implementation scenario
- Required investments and operation costs
- Rollout strategy

Request for proposal (RFP)
- Top 20 requirements
- Other 'nice to have' requirements

If solution or service is to be purchased
- Provider evaluation
- Benchmark
- Contract
- Test

Implementation
- Internal adoption
- Test
- External adoption with suppliers and customers
- In countries where legally required (Germany, Switzerland, …): Document everything in a 'procedure documentation'.

Rollout
- Concept with scenarios for each sector of counterparts
- Dialogue with key suppliers and customers
- Mass-rollout

During the whole project: Communicate at least twice as much as you believe is necessary – you can never over-communicate!

4.3 Success factors and benefits

4.3.1 Success factors

Although we have a high number of innovative people in our world, the majority of human beings change their behaviour only under pressure. That is why a simple invitation to your trading partners to support e-invoicing may not automatically result in a quick success.
The volatile economical situation results in high cost pressures and will probably become an accelerator for changes in the invoice processing. Readers are not recommended to wait for pres-

sure from their customers or suppliers. Instead, it is wise to start an e-invoicing project proactively. Only then is it possible to clarify everything without too much time pressure and to move seamlessly from paper to electronic invoices.

Main reasons why e-invoicing projects have not always succeeded immediately in the past are

- Underestimating the significance of the project for the many related processes and departments involved
- Poor project management
- Too technical focus (the more important challenges are the process automation and taking on board a high number of suppliers or customers within a short time)

Success factors in e-invoicing projects

- Awareness by senior executives about the potential of e-invoicing in a broader sense (the value is much more than just eliminating printing and stamp costs or entering invoice data into the ERP system)
- Management support, as many divisions within an organisation are involved
- One very active project owner
- Defining a three year objective/strategy, but implementing it step-by-step including a quick-win result for step one (best is just one invoice stream in one division of a big company)
- Internal and external communication to key persons affected
- Being a rollout champion with an excellent strategy for taking on board a high number of suppliers/customers (opt-out strategy if possible, combined with active marketing)
- Being realistic regarding mid- and long-term technical capabilities in your organisation including workflow and archiving → right decision for make/buy and direct or network model
- Don't re-invent and develop solutions which are already available for a fixed price and which have been well tested in other companies
- Being realistic regarding technical capability of your counterparts to send, receive and archive electronic invoices (this is quite often dramatically lower than you expect); simple and economical interfaces and possibly a third party archiving service are essential

4.3.2 Benefits and business case

For about two decades, the private industry was the only driver for the market development of e-invoicing. Users decided to migrate to electronic processes to take advantage of several benefits such as

- Process innovation and automation
- Improve operational efficiency; reduce the high proportion of discrepancies and manual exception handlings
- Improve accuracy of master data and the invoice content respectively the compliance with orders and contracts
- Improve tax compliance
- Optimise cash management
- Increase business agility
- Reduce invoice fraud
- Increase transparency
- Environmental improvement
- Satisfy the demand of key trading partners for digital interaction
- Reduce costs

The implementation of e-invoicing is partly an IT project. Due to this fact, especially larger businesses had to calculate a business case in the past.

These business cases roughly confirmed this generic rule:

Electronic and automated invoice processes can result in savings of 60-80% compared to traditional paper-based processing. Projects typically result in a payback period of 0.5-1.5 years.

According to many surveys, about 90 percent of the larger companies in advanced economies are meanwhile users of e-invoicing, although some may exchange just a small proportion in electronic format. Nevertheless they might have achieved a good business case. By experience are there just a few reasons that the result was not fully satisfying. A typical example is if the internal operation of the old paper-based invoice processing is remained in parallel to e-invoicing instead of migrating internally completely to digital processes. A further example is if businesses try to develop everything in-house instead of using field-tested solutions of third parties. Another reason is quite often that organisations follow just a reactive approach instead of proactively define a strategy and implement in a planned and coordinated manner. They suffer of the heterogeneous IT, process and compliance environment that appears over the years.

We estimate that today around 40%, but in 2025 already 80% of organisations will be forced either by legislation or important trading partners to exchange invoices just in electronic format. Hence, a business case can no longer be the trigger for a GO or NOGO decision. Rather could it be replaced in the future by a calculation comparing the values generated by certain solution providers.

However, if anybody still is interested in more details of a business case, some more information can be found in the document http://www.billentis.com/e-invoicing-businesscase.pdf

4.4 The e-invoicing opportunity

E-invoicing and business process automation might be THE answer for today's challenges in the market.

The time is right for taking the next step now!

5. Esker

Headquarters:

Esker
113 Boulevard de la Bataille de Stalingrad
69100 Villeurbanne
France

Countries with highest e-invoicing revenues	France, U.S., Spain, Italy, Germany, U.K.
VAT compliant e-invoice processing guaranteed for	More than 60 countries in Europe, America, Africa and Asia Pacific
Number of employees dedicated to e-invoicing and directly related offering	450
Registered users on own e-invoicing platform	Suppliers: 680 Buyers: 705,000 Consumers: 114,000
Processed volume on own e-invoicing platform	14.5 million e-invoices per year
Core offering	AI-driven process automation software
Covered processes/messages along the supply chain	Order-to-cash (O2C) solution (order management, accounts receivable — invoice delivery, collections management, payment, cash allocation). Purchase-to-pay (P2P) solution (purchasing & accounts payable)
Value-added services	Sending and archiving of paper and e-invoices; processing and extracting data from incoming PDF invoices; hybrid mail services; online tracking of customer invoices in real time; collections management metrics and tools
Main target market segments	Large and SMBs in any industry
Supported languages (with application/service and customer support)	English, French, German, Italian, Spanish
Competitive differentiator	One on-demand platform to automate e-invoices, as well as the O2C and P2P cycles

Take control of your AR and AP processes.

Esker is a worldwide leader in AI-driven process automation software, helping financial and customer service departments digitally transform their O2C and P2P cycles. Esker's solutions incorporate artificial intelligence (AI) technology to drive increased productivity, enhanced visibility, reduced fraud risk, and improved collaboration with customers, suppliers and internally.

Esker's Accounts Receivable solution provides **100% invoice delivery** to customers according to their preference (e.g., mail, fax, email, EDI, publication on a web portal). Esker's customer portal provides suppliers and customers with a collaborative workspace, invoice status information and convenient chat function.

E-invoicing and accounts payable.
Esker's Accounts Payable solution delivers compliant, paperless invoice processing on a global scale. Esker enables customers to offer their suppliers a wide range of e-invoicing submission methods, allowing them to take full advantage of e-invoicing benefits including early payment discounts and reduced processing costs.

Ensure global e-invoice compliance.
Esker helps businesses navigate the complex universe of e-invoice regulations and achieve global compliance by supporting any technology method a company chooses:

- **Compliance via e-signatures**. Through its partnership with Sovos TrustWeaver, Esker applies the appropriate e-signatures, time stamps and verifications in over 60 countries.
- **Compliance via EDI**. Esker provides data mapping in the appropriate format, secured exchange via any communication transport (e.g., AS2, VPN, SFTP, etc.) and interoperability with any platforms.
- **Compliance via BCAT**. Esker's audit trail and reporting capabilities keep track of all customer information, supporting documents and customer orders — from receipt and posting to dispatch and electronic archiving.
- **Compliance in archiving**. Vendor and customer invoices are e-archived in separate locations and accessible via a secured portal. E-invoices are archived in compliance with all European Directives and regulatory frameworks.

Esker is able to generate e-invoices in all types of formats (e.g., PDF, XML, EDIFACT, ANSI, UBL, etc.) and communicate with platforms from other service providers and public administrations (e.g., FACe, SDI, Chorus, Billexco, PEPPOL, etc.).

Paper invoice delivery just got a whole lot easier and faster.
For customers not ready to receive e-invoices, the delivery of paper invoices can be automated using Esker Mail Services. Invoices are electronically submitted directly from any ERP, desktop or other business application for worldwide delivery to postal services in less than 24 hours, making business mail 100% electronic for the sender.

Bring collections into the 21st century.
Esker's collections management solution helps companies modernise all post-sale collection interactions easily and electronically, without replacing their core billing and collections processes. Suppliers and their customers benefit from a faster and more transparent collections process to speed up customer payments and reduce collection disputes.

Optimise O2C performance and drive company success.
From order management automation to customer e-invoicing to collections management software, Esker has the solutions today's businesses need to enhance their O2C performance. Automating these processes equates to improved end-to-end customer experience, greater cost savings, streamlined cash flow management, and increased collaboration and transparency.

For more information: www.esker.com/einvoicing // info@esker.com

ARKADIN REDUCES INVOICE PROCESSING TIME BY TWO-THIRDS WITH ESKER

CUSTOMER TESTIMONIAL

arkadin®
COLLABORATION SERVICES
an NTT Communications Company

THE CHALLENGE

Arkadin, one of the largest and fastest growing collaboration service providers in the world, was looking to standardise its accounts receivable (AR) processes across all its subsidiaries, increase productivity and improve its DSO. After putting in place a Microsoft Dynamics™ NAV ERP solution, Arkadin required an invoice automation solution that would free-up its subsidiaries from the demanding and time-consuming task of manual processing, automate invoice delivery (paper and e-invoices), and speed-up the entire invoicing process.

THE SOLUTION

In order to address the various constraints on its subsidiaries, Arkadin selected Esker's Accounts Receivable solution to automate customer invoice delivery. Esker delivered major productivity gains for Arkadin — paper invoices are automatically sent from an Esker mail production facility with no manual intervention and e-invoices are delivered by email, either with an attachment or a link to a web portal. Following an initial pilot programme in France, Arkadin quickly deployed the solution across its subsidiaries in Europe, North America and Asia Pacific. Today 27 Arkadin subsidiaries use Esker to send more than 25,000 monthly invoices (predominately e-invoices) — amounting to over 113,000 pages.

CUSTOMER BENEFITS

Since implementing Esker, Arkadin has gained numerous benefits, including:

- Significantly reduced invoice processing time (from six to two days)
- Improved DSO by shortening invoice delivery time
- Electronic archiving for easy access to documents and information security
- Improved invoice tracking and sending guarantees
- Full compliance with international e-invoicing regulations
- Consistent pricing at all subsidiaries

> With the rapid development and growth of our company, our IT strategy is to invest in solutions which enable us to streamline processes and reduce costs. Our invoicing process was a key element of this strategy. Esker immediately knew how to address our needs and deliver a pertinent solution, allowing us to reduce our invoice processing time by two-thirds and to significantly improve our DSO.
>
> Director of Information Systems at Arkadin

> We are very pleased with our collaboration with Esker — they are always responsive to our needs. Now, our invoicing process works perfectly and we are confident about the future. Following its success in Europe, we deployed the AR solution in the United States and Australia and have implemented Esker's accounts payable automation solution.
>
> Director of Information Systems at Arkadin

PARTS TOWN PERFECTS ITS O2C & P2P PROCESSES WITH ESKER

CUSTOMER TESTIMONIAL

THE CHALLENGE

As a supplier of genuine OEM restaurant equipment parts, Parts Town had, at that time, been growing at clip of 35% for nearly a decade. Despite having a relatively new SYSPRO ERP system in place, many of the company's manual document processing methods couldn't keep up with the growing volumes.

Parts Town's need for modernisation extended to both its O2C and P2P business cycles — and the reasons for making a change went far beyond just growth and scalability.

On the O2C side, a major focus was eliminating the low-value manual work associated with processing AR invoices, sales orders and a variety of other O2C-related documents. On the P2P side, Parts Town was not only dealing with similar issues of staff members spending their time on low-value, manual tasks, accountability into things like invoice approval was nonexistent.

> Befrore Esker, we had no controls in place when routing AP invoices for approval. Now, all expenses are routed electronically with full transparency and accountability.
>
> Accounting Manager at Parts Town

THE SOLUTION

The goal was simple: Find a solution that could work with its ERP system, be utilised in a SaaS model and, ideally, be flexible enough to extend to multiple business processes. Parts Town only found one provider that met its criteria — Esker. Parts Town selected Esker to automate its O2C and P2P processes due to the solution's:

Scalability
Esker's SaaS solution offered an easier installation and the ability to scale with growth.

Flexibility
With Esker, multiple processes can be automated from the same integrated platform as needed.

Functionality
Technologies such as OCR, auto-routing and electronic archiving streamline key areas of workflow.

Simplicity
Customisable dashboards and customer/supplier portals bring additional convenience and self-service to daily activities.

CUSTOMER BENEFITS

O2C Benefits:

- Increased speed
- Time & cost savings
- Enhanced visibility
- Customer satisfaction

P2P Benefits:

- Time & cost savings (30% additional savings thanks to more early payment discounts being captured)
- Improved productivity (60% increase in productivity)
- Enhanced visibility

> Parts town was named winner of the AR & O2C Spotlight Awards, "ORDER-TO-CASH DEPARTMENT OF THE YEAR". This award was given to Parts Town for automating its manual cash conversion process, improving customer service, increase productivity and reducing DSO.

SCHIBSTED SPAIN STREAMLINES THE DELIVERY OF 300,000 INVOICES TO THE PRIVATE AND PUBLIC SECTORS WITH ESKER

CUSTOMER TESTIMONIAL

SCHIBSTED SPAIN

THE CHALLENGE

Schibsted Spain, a leader in digital media and online classified ads, was looking to automate the delivery of its customer invoices. The company also wanted to provide its customers with a self-service web portal, enabling them to access their invoices, check payment due dates, and report any invoice or payment discrepancies.

Schibsted Spain's customer, the Spanish Public Administration, requires its suppliers to send e-invoices to its FACe platform, making it important that Schibsted Spain select a solution able to issue e-invoices compliant with government regulations.

THE SOLUTION

Schibsted Spain selected Esker's Accounts Receivable solution to automate the delivery of its 300,000 annual invoices, with a majority of invoices made available on its personalised portal. Implemented in a just few weeks, Esker's solution enables Schibsted Spain to send e-invoices to customers in both the private and public sectors. With a few clicks, the company can send invoices directly to the FACe platform.

> Automating invoice delivery eliminates the complexity of having to know the various formats based on a customer profile.
>
> ERP Manager at Schibsted

CUSTOMER BENEFITS

Esker has helped Schibsted Spain achieve many benefits, including:

- Automated delivery and archiving of e-invoices
- Invoice delivery according to customer preferences
- Enhanced collaboration and communication with Esker's portal
- Improved invoice traceability and dispute resolution
- Invoice submission directly to the FACe

> Esker automatically selects the delivery method: by portal, email or via FACe. We greatly appreciate the efficiency it has brought.the invoicing process, and our customers find it much more convenient and transparent.
>
> ERP Manager at Schibsted

6. Appendix

6.1 Glossary

In the course of this report, a number of key notions are frequently referred to. To avoid any ambiguity, the following definitions apply to these notions.

Figure 44: Glossary

AR	Accounts Receivable
AP	Accounts Payable
Artificial Intelligence, AI	Broader concept of machines being able to carry out tasks associated with humans around learning and problem solving. It has the cognitive ability to look for and learn on certain patterns and to take appropriate actions.
B2B Invoices	In this report: Includes all tax compliant invoices to corporate as well as to the public sector; B2B & B2G/G2B
Bill	Includes all categories of bills sent to consumers (B2C/G2C)
Clearance System / Model	Legal regimes in which an electronic invoice must be sent to the tax administration or its licensed/accredited agent for authorization prior to, during or just after issuance as an original tax invoice.
DPO	Days payable outstanding is an efficiency ratio that measures the average number of days a company takes to pay its suppliers.
DSO	The days sales outstanding is a calculation used by a company to estimate their average collection period.
E-billing	E-billing covers in this report the electronic bills from Business-to-Consumers (B2C). Some market participants use this term alternatively for the process on issuer side in general, regardless if the customer is an enterprise or household.
EBPP	Electronic Bill Presentment and Payment; focus in B2C; this acronym is more popular outside Europe
EIPP	Electronic Invoice Presentment and Payment; focus in B2B/B2G; this acronym is more popular outside Europe
E-invoicing	Electronic invoicing is the sending, receipt and storage of invoices in electronic format without the use of paper-based invoices as tax originals. Scanning incoming paper invoices, or exchanging electronic invoice messages in parallel to paper-based originals is not electronic invoicing.
Internet of	Infrastructure of the information society. The inter-networking of physical

Things, IoT	devices, vehicles (also referred to as 'connected devices' and 'smart devices'), buildings, and other items - embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.
Invoice	Includes in this report all categories of invoices: B2B, B2C, B2G, G2B
Issuer	Invoice issuer, supplier, biller
Network operator	Service provider respectively operator with any-to-any model; an invoice issuer or recipient needs just one interface for achieving any other counterparty in the same network; In some countries, the terms 'operator', 'service provider', 'consolidator' or 'supplier network' are more common.
Order-to-Cash	Supplier perspective for the processes order-delivery-invoicing-payment
P2P	Wikipedia: 'The e-procurement value chain consists of indent management, e-Informing, e-Tendering, e-Auctioning, vendor management, catalogue management, Purchase Order Integration, Order Status, Ship Notice, e-invoicing, e-payment, and contract management.' Purchasing is a subset of procurement. Purchasing generally refers simply to buying goods or services (order to payment). Purchasing often includes receiving and payment as well.
PO	Purchase Order
POS and mobile invoicing	Point of Sale invoicing; on a classical payment receipt, the included information is limited and the customer is normally not identified; if however, the customer is identified and considered in the content of the resulting confirmation document, the former payment receipt is upgraded to a classical invoice that can automatically be processed. The same is valid for purchases via mobile devices, e.g. train and flight tickets.
Procure-to-Pay	Buyer perspective for the processes of selecting vendors, establishing payment terms, strategic vetting, selection, the negotiation of contracts, actual purchasing of goods, order, delivery, invoicing and payment.
Purchase-to-Pay	Buyer perspective for the processes order, delivery, invoicing and payment. Purchasing is a subset of procurement.
SCF	Supply Chain Finance; Use of financial instruments to optimise working capital and liquidity tied up in supply chain processes for collaborating trading parties.
SME	Small and Medium sized Enterprise

Recipient	Buyer, Customer; The individual or organization that will receive the invoice

6.2 Sources

Figure 45: Key sources used in this report

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[14]	Federal Tax Service of Russian Federation	February 2017
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Ref	Document and/or hyperlink	Date or version
	processing. Additional information on the Business Payments Coalition and the e-invoice work groups can be found at https://businesspay-mentscoalition.org/	
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