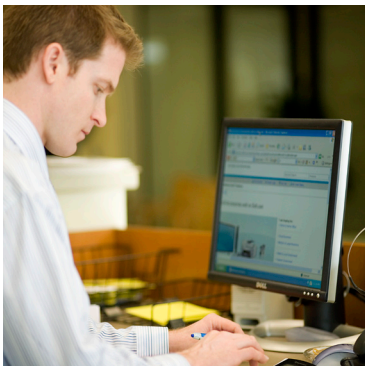

Applying best practices for secure, automated electronic invoicing

Using Intelligent PDF to support compliant eInvoicing solutions

Table of contents

This paper proposes a solution for secure, automated electronic invoicing that uses intelligent PDF (ISO 32000) and Adobe® LiveCycle® ES (Enterprise Suite) server technologies. The eInvoicing process, as developed by the CEN/ISSS Workshop on Compliance of eInvoices has used as a foundation and is compliant with respective European Union (EU) directives and national value added tax (VAT) laws.

The importance of eInvoicing

As the world's economies globalize, the pace of innovation accelerates, and the use of electronic business processes grows, companies and policy makers are pressured to find new ways to remain competitive and to provide better customer service to end users and constituents. Automation and simplification of business-to-business transactions through the adoption of eInvoicing standards is critical for faster and more accurate processing, reduced costs, greater business agility, and processes that meet compliance with tax and other regulations. Automation also makes common tax verification activities less intrusive and disruptive to core business activities.

eInvoicing offers significant advantages over paper-based processes. Processing invoices electronically may be as simple as sending and receiving invoices digitally, or as sophisticated as delivering straight-through processing that eliminates the need for manual intervention in common tasks. Suppliers avoid the costs of paper printouts, enveloping, and postage. Faster transmission of the invoice and automated processing speed up account settlement. Automated processes reduce opportunities for human errors that can have serious customer, partner, or tax implications. By streamlining trade activities, eInvoicing fosters innovation, competitiveness, and growth. The maintenance of electronic trade data in electronic formats can streamline business reporting, electronic filing, and compliance-related tasks.

The European Union and eInvoicing

The EU faces unique challenges as it seeks to harmonise regulations for more than 25 member states, facilitating innovation and productivity, trade, and growth. Central to the flow of commerce within and between member states are paper-based invoicing processes that are critical to the VAT system of EU countries. VATs represent 30% of revenue across the EU, and electronic invoicing has been identified by the European Commission as a vital instrument for harmonizing and simplifying VAT collection across borders and improving VAT-based revenues by an estimated €40 billion annually[1] through proper collection.

VAT is passed through the supply chain and ultimately absorbed by the end consumer of a good or service. The input tax paid by a supplier is reclaimable or deductible from taxes owed. Invoices are the cornerstone of this system because they establish and demonstrate a buyer's right to reduce his or her tax burden by the VAT paid on these purchases.

Adobe

"The promise of eInvoicing is to enhance economic vitality by simplifying core business processes. Software architectures that enable straight-through invoice processing utilizing open standards such as PDF will play a strategic role in realizing that promise."

Stefan Engel-Flechsig
Legal counsel and chairman
CEN/ISSS Workshop
on Compliance of eInvoices

The economic benefits of eInvoicing to businesses within the EU are significant. More than 30 billion invoices are generated each year. The vast majority of this activity is paper invoices, with an average cost of €30 per invoice. Early case studies show that a shift to eInvoicing in EU countries can reduce invoicing costs by as much as 80%. For example, the savings from the conversion of business-to-business invoicing alone within the EU is conservatively estimated at €243 million annually.[2] Paper-based invoicing systems can be slow and error-prone because as they require significant human involvement, including handling and media transfers from computerized systems to paper at the invoice's source and back to the buyer's electronic systems. Tracking and correcting errors can add further delays and costs to transactions. The cost of processing an invoice-related complaint typically exceeds €100.[3]

The European Commission has set out a legal framework (Council Directives 2001/115/EC and 2006/112/EC) for national regulations governing harmonized invoicing with regard to VAT requirements. This framework is designed to encourage the universal reach of eInvoicing across countries, sectors, and businesses, as well as inclusiveness, ease of use, and openness to competition and choice of service providers. The framework stipulates a set of master data fields that shall be incorporated in all invoices issued throughout the EU for VAT tracking purposes. Additionally, it encourages the use of electronic invoicing, provided that the authenticity of the sender and the integrity of content are guaranteed. The framework recognizes the use of advanced electronic signatures, such as digital signature technology, as well as other mechanisms based on the use of EDI systems. National tax legislation may add further stipulations, such as defining retention periods for invoices by either or both parties or requiring digital signatures.

eInvoicing process overview

Electronic invoicing systems must strive to deliver business efficiencies through end-to-end automations that permit straight-through processing and reduce costly errors and manual processes while improving productivity. eInvoicing systems must ensure the integrity and authenticity of data while complying with legal constraints and permitting auditors to conduct their inquiries unfettered by technical impediments.

Figure 1 shows a typical electronic invoicing process. The following processing steps are common to any deployment:

1. Prepare data—The supplier provides invoice data from online forms or directly from back-end systems such as order handling or shipping.

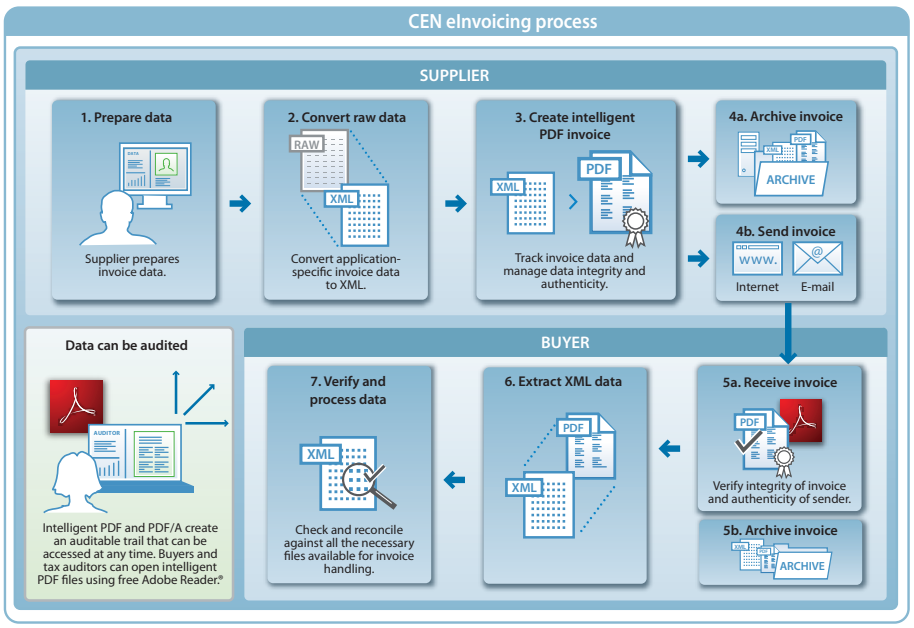

Figure 1. Typical electronic invoicing process based on the best practice developed by the CEN/ISSS Workshop on Compliance of eInvoices.[4]

2. Convert raw data—The application-specific invoice data created in step 1, which includes master data and any other information required for VAT processing, is converted to a portable and standards-based format such as XML.

3. Create invoice—Data converted in step 2 is used to create the invoice in a mutually agreed upon and legally compliant format.

4a. Archive invoice—As required by national law, the supplier must store the invoice in an archiving system for the required retention period.

4b. Send invoice—The invoice is either sent directly to the buyer via an electronic means such as e-mail or deposited for collection by the buyer from a location such as a website via web services, an FTP site, or other means. This step often includes technical controls to verify receipt of the invoice.

5a. Receive invoice—The buyer takes control of the invoice, performs a technical verification of characteristics (such as secure transmission, digital signatures, the presence of mandatory fields), and performs syntax checks.

Technically correct invoices are forwarded for formal verification, in which invoice content such as identification, date, VAT numbers, and product or service codes are checked.

5b. Archive invoice—As required by national law, the buyer must store the invoice in an archiving system for the required retention period. Verification details should be stored in addition to the invoice.

6. Extract data—Invoice data such as part numbers, quantities, prices, VAT amounts, and total amount is extracted from the document.

7. Verify and process data—Technically and formally correct invoices are forwarded for reconciliation against related documentation such as contracts, supplier catalogues, and delivery and payment terms. Verified invoices will be further processed.

Auditors may examine any steps in the eInvoicing process. Maintaining a comprehensive audit trail is a critical precondition for compliant eInvoicing. Audit trails must correlate the underlying exchange of goods or services and the electronic invoice that describes them. The supplier and buyer will both be required to store the invoice for a storage period specified in national legislation. The storage may be with a service provider and may be in another EU member state or in some circumstances outside the EU, but in all cases, the invoice must remain available to tax authorities on request. In addition, steps must be taken to ensure that evidence of an invoice's integrity and authenticity can be demonstrated over the long term. For example, this may involve the maintenance and backup of signatures and information used to confirm their validity, such as public key certificates and status information.

Intelligent PDF solutions for eInvoicing

Although there are more than 200 eInvoicing solution providers operating in the EU, few if any can offer a complete end-to-end eInvoicing solution that is equally accessible to humans and computer systems. Businesses are challenged to assemble a range of technologies and service providers to facilitate straight-through processing of invoices while ensuring that they comply with all regulatory requirements.

By combining two de-facto standards—XML for data portability and PDF for human readable documents with the power of digital signatures—intelligent PDF supports trading between virtually any two partners with fidelity and easy accessibility.

Nick Pope
Technical editor
CEN/ISSS Workshop
on Compliance of eInvoices

LiveCycle ES is a server-based solution that:

- Reduces the time needed to develop an eInvoicing solution by providing intuitive and integrated developer resources.
- Integrates a wide range of back-end systems such as ordering, enterprise resource planning (ERP), customer relationship management (CRM), and accounting in a unified solution.
- Assures the authenticity and integrity of invoices, ensuring conformity with European Commission and national standards, while inspiring confidence among trading partners.
- Facilitates business processes that mix electronic and print invoices.

The LiveCycle ES service-oriented architecture simplifies integration with existing systems, speeds development of customized eInvoicing solutions, and facilitates distributed and scalable deployments.

XML technology and Adobe PDF can be combined by LiveCycle ES processes to produce interactive intelligent PDF documents as the basis for robust and comprehensive eInvoicing solutions that give suppliers reach into any trading partner, from large enterprises to small businesses.

Intelligent PDF files capture data in a machine- and human-readable format. Leveraging open and extensible XML, they support integration with back-end systems, business partners, and emerging standards for reporting, while remaining human-accessible from any computer with free and widely available Adobe Reader software. Trading partners are not limited by each other's business processes because open standards ensure invoice portability across internal practices. Companies can convert invoices to documents of record in support of retention requirements. Intelligent PDF files can be digitally signed with human-readable representations of the signature, securely transmitted, and assigned security policies. Intelligent PDF files can be combined in PDF assemblies for seamless delivery as a single file with supporting documentation. The combination of XML and PDF allows organizations to support print and other presentations.

By combining business logic and the data exchange capabilities of XML with the visual fidelity, security, and reliability of Adobe PDF, LiveCycle ES and intelligent PDF help organizations streamline invoice exchange, increase efficiency, reduce costs, and meet compliance mandates.

Adobe eInvoicing architecture

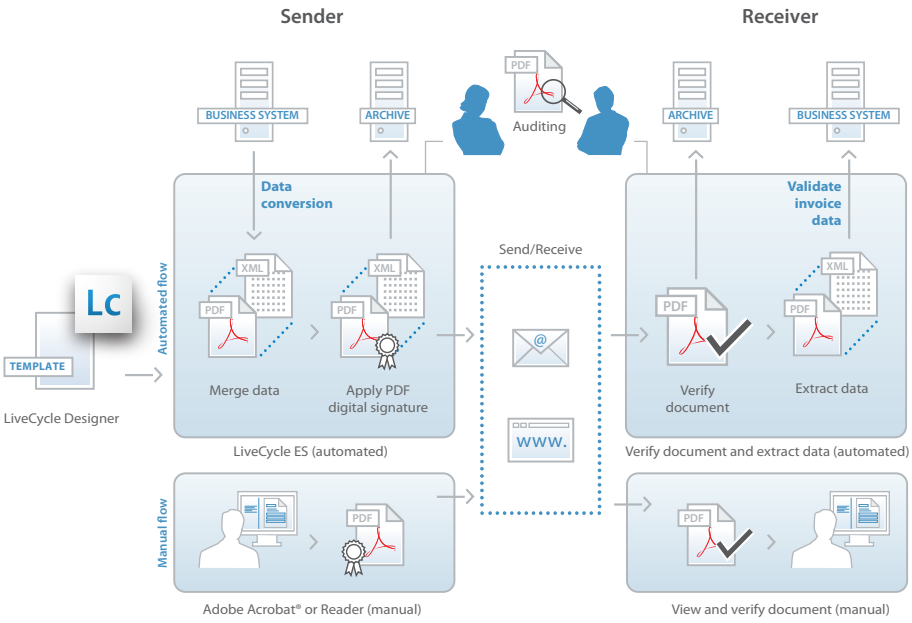

Figure 2. An eInvoicing architecture that uses intelligent PDF and Adobe LiveCycle ES server technologies.

Figure 2 shows an eInvoicing architecture using intelligent PDF and Adobe LiveCycle ES technologies. The following steps describe the comprehensive straight-through invoice process using intelligent PDF technologies, and apply equally to scenarios with and without third-party service providers:

1. Data preparation and conversion—The seller prepares invoice-specific data, typically using an online form or special-purpose application such as order handling software. This data is created in an application-specific format.

The application-specific invoice data, including master data and any other information required for VAT processing, is converted to standards-based XML using LiveCycle ES components that enable integration with IT infrastructure. XML is a flexible format for describing the structure and presentation of a document and greatly simplifies the reuse of information across a wide range of human- and application-centric processes.

2. Create intelligent PDF invoice—The XML-formatted invoice data is merged with an invoice template to create intelligent PDF documents. LiveCycle ES invoice templates work in concert with output mechanisms such as LiveCycle Output ES to support advanced capabilities,

including dynamic repagination and layout to accommodate invoices of any length and complexity, and the ability to scale to generate high volumes of invoices in support of batch processes such as monthly billing. Invoices are automatically signed through integration with LiveCycle Digital Signatures ES, using securely generated certificates. Suppliers can integrate existing public key encryption, smart card technology, or Hardware Security Modules. The resulting PDF electronic invoices retain paper-like characteristics and are easily accessible via Adobe Reader. Because data is stored within the invoice in open, machine-readable XML, the document is equally well suited to being consumed by software as part of straight-through processing.

3. Archive data—The invoice may be routed to an archiving system for the retention period required by national law. Invoice data may be stored separately as XML, and the PDF file can be converted to the ratified ISO-standard PDF/A format for long-term archiving. LiveCycle Output ES supports the ability to convert the PDF invoice to a PDF/A file containing a representation of the digital signature for streamlined archiving that confirms authenticity and ensures integrity details remain paired with the invoice, thus removing the requirement to arbitrarily combine or cross-reference an invoice with critical audit and control information.

Invoices can be routed to the LiveCycle enterprise content repository or an asset management system. Using LiveCycle ES Connectors for ECM, invoices can also be routed to third-party enterprise content management (ECM) systems such as EMC Documentum or IBM FileNet.

4. Send invoice—In parallel with archiving, the PDF invoice is made available to buyers or their agent. LiveCycle document output components are used to deliver the invoice via e-mail or secure e-mail to a designated address, to post it to a website, or to make it available via programmatic technologies such as web services. In cases where a customer opts to receive paper invoices, the PDF file can be directed to a departmental or high-volume printer for inclusion in the mail stream.

5. Receive invoice—The invoice enters the buyer's area of control via a designated e-mail account or other means, and it is available for processing.

6. Document verification and processing—Technical aspects of the receipt of the invoice, including authenticity and integrity information such as a digital signature, are verified programmatically using LiveCycle Digital Signatures ES or manually by an operator using Adobe Reader. The XML-oriented nature of the intelligent PDF invoice facilitates automated checks of the technical characteristics of the invoice's content, such as the existence of required VAT master data. Formal validation of invoice content can be consolidated at this stage to include performing checks on the invoice's content as well as its structure and syntax.

7. Archiving—The invoice is routed to an archiving system for the retention period required by national law. The process for the buyer is the same as described earlier for the seller.

8. Extract data—XML data is extracted from the intelligent PDF invoice. Since the PDF file contains the XML's structure and data, this process is both reliable and simple to implement using readily available techniques. In cases where paper invoices are required, LiveCycle Barcoded Forms ES provides an efficient and error-free method for invoice data capture.

9. Validate invoice—The invoice's XML data is submitted for material validation against external documentation such as supplier contracts. Since XML is a platform- and application-independent format, it offers many opportunities for low-cost automation of these checks. The LiveCycle ES Foundation components facilitate seamless integration with back-end systems such as accounting or other VAT-management software to provide automated verification against business records and accurate capture and reporting of input tax credit information.

Auditors may examine any steps in the eInvoicing process. Intelligent PDF documents provide auditors with a friendly and intuitive visual format. eInvoices archived in PDF/A guarantee the fidelity of the invoice, while the use of XML ensures that invoice data can be transformed to any format required by auditing software.

Case studies

Poste Italiane

Poste Italiane is the provider of postal services in Italy and is one of the largest invoice processors in Europe. This agency has deployed an intelligent Adobe PDF solution to improve its entire billing process.

The solution meets several goals. Poste Italiane has streamlined invoicing processes with electronic automation while providing customers with the option of receiving paper invoices. This provides a single repository of all electronic invoices sent out and also meets regulatory mandates for the use of digital signatures because Adobe PDF is a legally recognized format for digital signatures in Italy.[5]

Invoice data is retrieved from an SAP system and used to generate PDF files, which are batch signed and timestamped and then automatically delivered electronically or by mail if the customer chooses. PDF enables customers to read invoices using free Adobe Reader software available for any desktop operating system.

Poste Italiane estimates that more than 1.5 million pages have been converted to digital form per billing period. Between this shift and the streamlining of its internal workflow, the agency has realized significant cost savings.

Cuatrecasas

Cuatrecasas is the second largest law firm in Spain. Following the adoption of EU framework directives, Spain passed national legislation on eInvoicing. Cuatrecasas implemented a project to deliver electronic invoices to its customers. The firm evaluated several formats and technologies and selected Adobe-based intelligent PDF to easily generate tamper-proof invoices in multiple formats. Invoice data is automatically integrated from the firm's ERP system and merged with PDF templates to produce client invoices. PDF provides an equivalent experience to paper, in an online setting. The fidelity of PDF to paper was a critical requirement for Cuatrecasas. As a result of this innovation, the firm has reduced invoicing costs by thousands of euros annually, streamlined internal workflows, and met client demands for faster and more convenient invoicing options that support its electronic and manual workflows.

Europcar

European car rental company Europcar Germany implemented an Adobe LiveCycle based eInvoicing solution that uses intelligent PDF documents and data in either XML or the recipient's preferred data format. PDF templates are merged with the invoice data to produce an invoice in PDF, which is then digitally signed to fulfill tax law requirements. In contrast to other eInvoicing solutions, Europcar's solution not only reduces printing costs but also adds value for the invoice recipient—customers are able to extract data from the signed PDF document to allow automatic data import to their ERP processes. No manual rekeying or OCR workarounds are required.

The solution leverages legally approved digital signature components obtained through the Adobe partner program. The Europcar solution has been audited and certified to fulfill all European tax law requirements.

By adding recipient value, Europcar is supporting its sales and marketing strategy to enhance the customer experience and increase loyalty.

Summary

Clearly, the economic benefits of eInvoicing for businesses within the EU are significant. The eInvoicing process offers significant advantages over paper-based processes, including more efficient trading, automated compliance, and lower costs. Recent deployments, however, have shown high levels of complexity, which has slowed adoption of eInvoicing. Few eInvoicing solution providers can offer a complete end-to-end solution that conforms to the process described by the European Committee for Standardization. Adobe LiveCycle ES combines XML and PDF technologies to create eInvoicing workflows that are equally accessible to software processes and humans, providing PDF digital signature capabilities and enabling comprehensive solutions for trading partners.

About CEN

CEN, the European Committee for Standardization, was founded in 1961 by the national standards bodies in the EU and the countries of the European Free Trade Association (EFTA). Adobe is a registered member of the CEN/ISSS Workshop on Compliance of eInvoices. For more information, visit *www.cen.eu/isss/einv2*.

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