



# TECHNICAL WHITEPAPER

## Pagero e-invoicing solution

**TAKING THE COMPLEXITY OUT OF ELECTRONIC INVOICING**

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## **PAGERO E-INVOICE SOLUTION**

Pagero offer a full range of scalable e-invoice solutions for small, mid-sized and large companies with local or global operations. Our services connect our customers' accounts receivable and payable ledgers with each other regardless of ERP-system. The Pagero e-invoice solution increase operational efficiency, enhance security, shorten DSO (Days Sales Outstanding) and contribute to minimized use of our environmental resources.

The Pagero e-invoice solution is a complete service offering for companies that need to send or receive (or both) electronic invoices. Companies that send e-invoices may use one of our two invoicing software plug-ins, depending on the technical capability of the current invoicing system:

The invoicing system is able to export invoice information on a structured format (XML, EDIFACT, TXT):

- Use the Pagero e-invoice Outbox plug-in.

The invoicing system is not able to export invoice information on a structured format:

- Use the Pagero e-invoice Virtual Printer plug-in

The latter of these two cases is key to enabling large volumes of invoice issuers to send electronic invoices because it virtually removes the need for IT investments for companies using legacy invoicing systems.

See Section "How it works" for more information about how we handle these two cases.

Companies that need to receive invoices may do so using the Pagero e-invoice Inbox plug-in. This is a configurable software utility that allows companies to receive electronic invoices on a format that fits the receiving workflow system at hand.

### **FEATURES**

- B2B invoicing (send and receive)
- B2C invoicing (send)
- External Print services
- Invoice attachments
- E-invoice archive
- Format conversions
- Archiving of sender's original file
- Tax compliant e-invoice archive
- Digital signature issuing and validation
- Receive e-invoice as PDF file or tif picture for display in internal system
- Integration directly with ERP system
- Secure communication

Features are currently subject to service provider availability.

### **WHAT WE DO**

Secure and reliable true electronic invoicing requires technical solutions that tend to be expensive. The reason is that the companies involved on the receiving end often have home bread solutions requiring IT integration on the supplier side to fit each invoice receiver's system.

The Pagero e-invoice solution takes the complexity out of electronic invoicing. We provide a many-to-many architecture that enables even small suppliers to utilize e-invoicing for all customers without having to spend large amounts of money on special purpose IT integration. By providing a reliable server solution that works on a large scale for many customers, Pagero can solve your e-invoicing needs at a reasonable cost. We remove requirements for point to point solutions for all senders/receivers and invoices to the correct receiver on the correct format using a robust and reliable routing algorithm with secure communications and robust error handling.

Consider Figure 1, which describes the complexity of document transfer between companies that engage in for instance electronic invoicing. The leftmost part of the Figure 1 shows a point-to-point network where all companies are connected to all other companies that they need to communicate with. Compare that with the rightmost part of the figure where Pagero e-invoice takes care of all communication as well as format conversions.

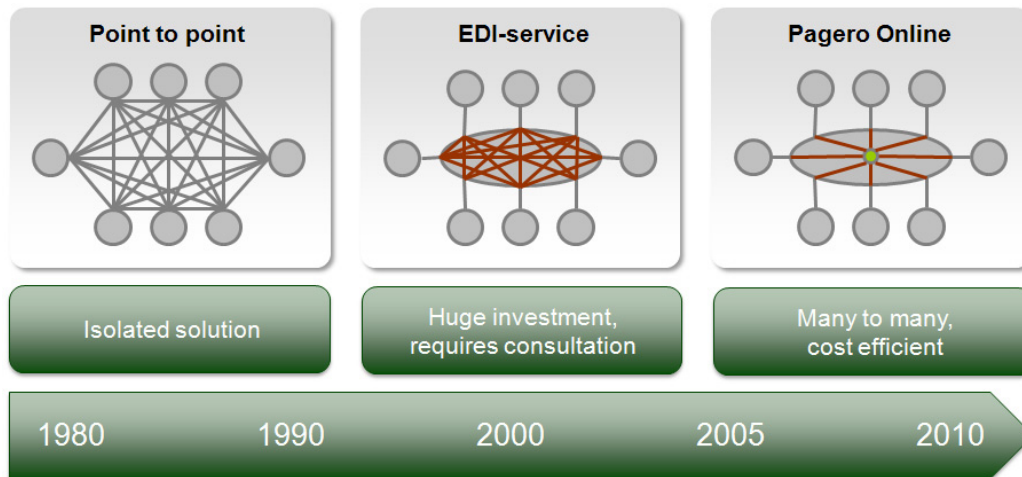


Figure 1 E-invoice network complexity removed with the Pagero e-invoice solution

As an invoice issuer, the only responsibility is to make sure that all information that is needed at the receiver end is included in that file that is sent. Pagero e-invoice covers the rest; format conversion for a particular receiver as well as secure communication of your file to that receiver.

**HOW IT WORKS**

Pagero e-invoice does not change the invoicing process itself nor go against traditional practice. It simply reduces unnecessary tasks and speeds up the invoicing process without any extra cost. Most companies have modern financial systems (ERP) installed that enables them to receive electronic invoices. However, due to the cost barrier for many suppliers invoices are still sent on paper only to be scanned back to digital format requiring manual labor on the receiver's end.

Pagero take care of digital-to-digital (D2D) without any hassle for the users. The offer is built around a low cost Internet service that allow companies to send e-invoices to customers requiring electronic invoices, by downloading a small self installing printing interface which provides secure communication with Pagero's e-invoice service.

Invoice receivers are either connected to the Pagero e-invoice system or to another consolidator's network. A consolidator can be either a bank or a Value Added Network/EDI converter/Consolidator. The Pagero e-invoice system can reach receivers in both these spheres.

To reach e-invoice receivers in a consolidator's network an invoice issuer may need to have a separate agreement with that consolidator in addition to having an agreement with Pagero. Also note that not all consolidators provide all possible e-invoice services. Pagero is constantly developing partnerships with consolidators relevant for our customer's needs. Currently we have partnerships with Itella, Basware and Swedbank. We also have agreements for sending e-invoices through a range of others networks including Posten Strålfors, Progrator, BBS and the Swedish BGC banks and Nordea.

**THE E-INVOICING PROCESS (NON-SIGNED E-INVOICES)**

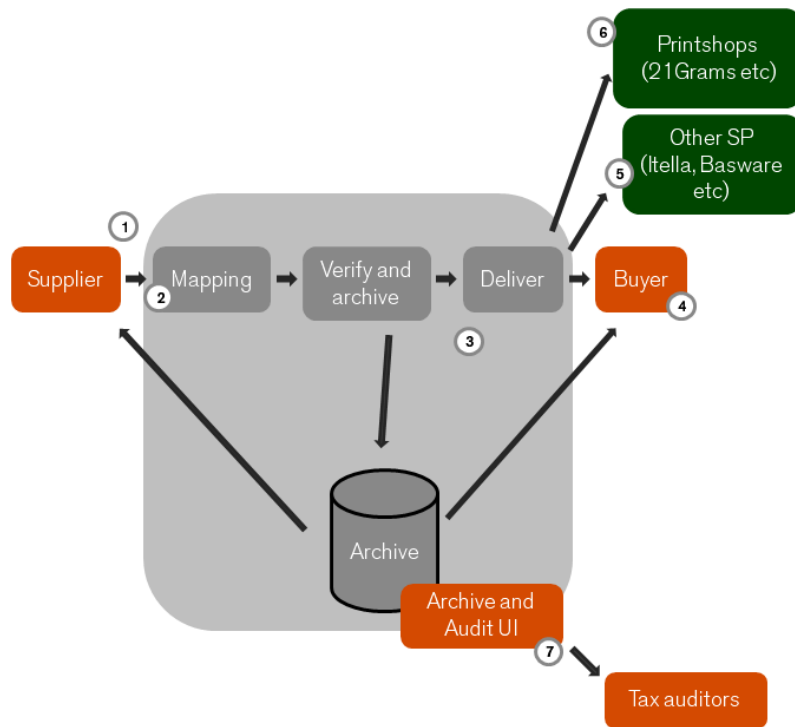


Figure 2 The Pagero e-invoice process flows

1. Pagero receives invoice data through a number of methods within the Pagero Connect suite, normally via secure protocols such as HTTPS or SFTP. Formats include PDF, XML (several variations), CSV and EDIFACT.
2. All received invoice data is mapped to a Pagero internal XML format before being converted to PDF for creation of the human readable format and mapping to the buyer requested data format.
3. The received invoice data format (in step 2), the internal XML, the outbound format and the PDF are all archived. Archiving is first done in an interim Pagero Online archive for 90 days before being moved to the long-term archive.
4. For directly connected buyers, the invoice data is sent over a secure channel and received and handled by Pagero
5. (Alternative delivery mechanism) Pagero Online can interoperate with a number of external service providers such as e.g. Itella, Basware, Posten-Strålfors etc. In this scenario the outbound data format is delivered to the service provider and Pagero does not offer validation or archiving services on behalf of the buyer.
6. (Alternative delivery mechanism) Pagero also offers printing and postal delivery as one delivery option; the supplier treats the invoice as electronic. This is today done through Itella's and 21 grams' services.
7. Suppliers, buyers and tax auditors can always access the archive via Pagero's user web interface Pagero Online.

**THE E-INVOICING PROCESS (SIGNED E-INVOICES)**

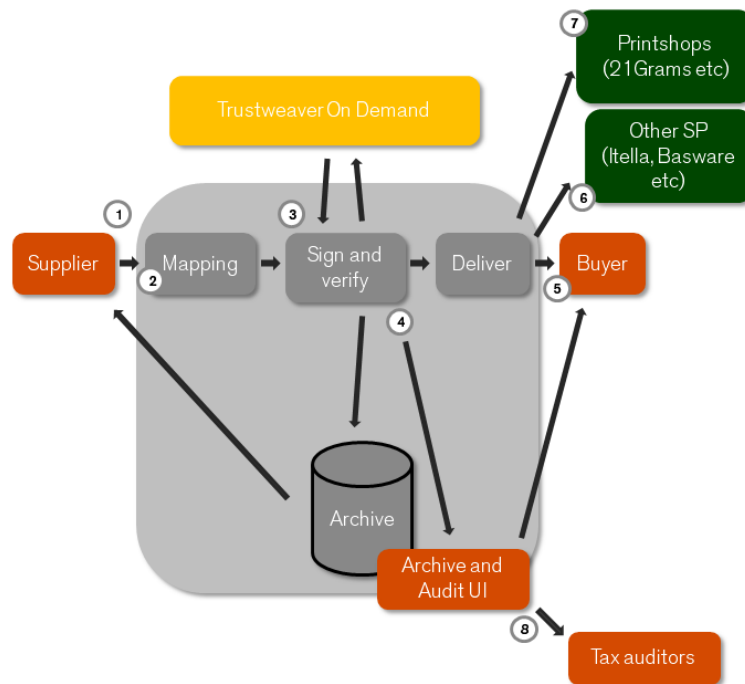


Figure 3 The Pagero e-invoice process flows, signed invoices.

1. Pagero receives invoice data through a number of methods within the Pagero Connect suite, normally via secure protocols such as HTTPS or SFTP. Formats include PDF, XML (several variations), CSV and EDIFACT.
2. All received invoice data is mapped to a Pagero internal XML format before being converted to PDF for creation of the legal invoice and mapping to the buyer requested data format.
3. The PDF is sent to TrustWeaver for signing on behalf of the Supplier and validation on behalf of the Buyer.
4. The received invoice data format (in step 2), the internal XML, the outbound format and the PDF are all archived. Archiving is first done in an interim Pagero Online archive for 90 days before being moved to the long-term archive. The signed PDF that is the result from the signature call to TrustWeaver is stored on behalf of the supplier and the result from the validation call is stored on behalf of the buyer (if the buyer is a Pagero customer).
5. For directly connected buyers, the invoice data is sent over a secure channel and received and handled by Pagero Connect on the buyer side.
6. (Alternative delivery mechanism) Pagero Online can interoperate with a number of external service providers such as e.g. Itella, Basware, Posten-Strålfors etc. In this scenario the signed PDF (the legal invoice) is delivered to the service provider and Pagero does not offer validation or archiving services on behalf of the buyer. Validation is instead done by the buyer or a service provider acting on the buyer's behalf.
7. (Alternative delivery mechanism) Pagero also offers printing and postal delivery as one delivery option; the supplier treats the invoice as electronic. This is today done through Itella's and 21 grams' services.
8. Suppliers, buyers and tax auditors can always access the archive and re-verify signatures as necessary via Pagero's user web interface Pagero Online, or TrustWeaver.

### **MAPPING OF PRINTOUTS TO ELECTRONIC FORMATS**

One of the keys to enabling all companies to send electronic invoices is to allow for the use of legacy invoicing systems, and remove the need for expensive IT investments. For customers that fit this category we offer Pagero e-invoice Virtual Printer. The customer invoices as usual, sending the invoices to a printer. However, instead of walking to the room next door to pick up the printouts, the print stream is captured by the Pagero e-invoice system and converted to the electronic invoice format of the receiver. Individual receivers are identified on the fly, and the print stream is converted to individual invoice files.

#### **How is this possible?**

Upon signing up for the Pagero e-invoice Virtual Printer service, the Pagero Service Center will contact you so that you can send a test invoice. The layout of the printed invoice is recorded by the system, and rules are set up for extracting information from the print out. This process takes 15 minutes to 2 hours depending on the complexity of the invoice.

### **CONVERTING BETWEEN STRUCTURED FORMATS**

Should your system already be able to export invoice information on a structured format, it only needs to be converted to the format of the receiver.

The Pagero e-invoice system contains a rich library of standard invoice formats of different types. We handle text, XML and EDIFACT formats. If your system can handle (in or out) one of the standard formats we already support the integration process is fast and easy.

We also offer development of conversions to and from custom formats on a consulting basis.

### **ADDRESS MATCHING AND ROUTING**

Once the receiver of an invoice has been identified there is a need for addressing the receiver electronically. The electronic ID of a receiver will look different depending on geographic location, what consolidator a particular receiver is connected to and the format associated with that receiver.

An invoice issuer may opt to make changes to the invoicing system to handle e-invoice addressing, or use the powerful receiver id and addressing feature of the Pagero e-invoicing system, available at no extra cost. The Pagero e-invoicing service includes a web based recipient directory management tool that allows issuers to manage all electronic recipients in one place.

Using language specific phonetic algorithms for receiver name matching the Pagero e-invoicing system is able to identify the receiver of an invoice and supply the correct electronic address information to enable correct routing of the invoice. See Figure 6 for a description of how routing and addressing make sure your invoices reached the correct receiver.

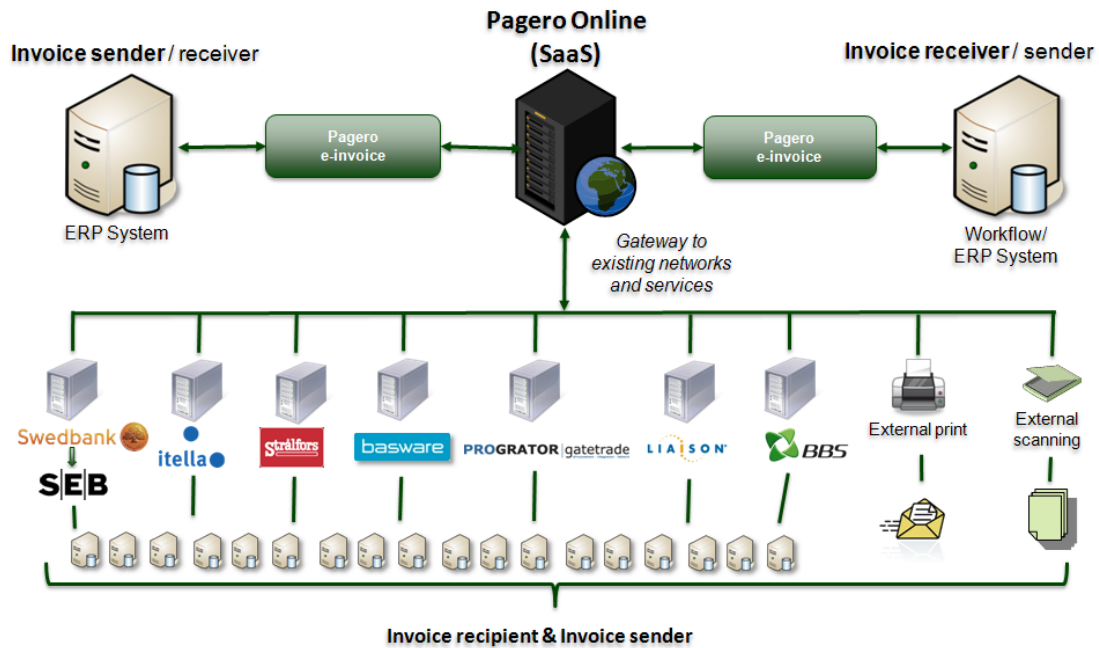


Figure 4 Pagero e-invoice routing and addressing

## E-INVOICE DIGITAL SIGNATURES WITH TRUSTWEAVER ON DEMAND

TrustWeaver On Demand offers support for a wide range of signing and validation mechanisms that are legally recognized in a broad range of countries. Relying upon a Services Oriented Architecture (SOA), applications such as EAI-systems, archiving systems and business messaging service providers (“hubs”) can integrate TrustWeaver On Demand in order to apply and validate digital signatures. TrustWeaver On Demand’s features – including support for multiple certificates and a variety of signature formats – can be mixed and matched in order to offer compliant e-invoicing for large, heterogeneous groups of businesses.

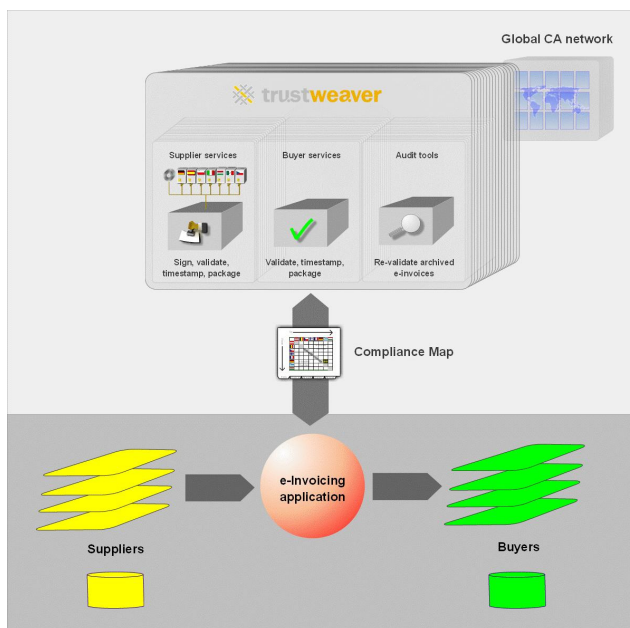


Figure 5 High level overview of TrustWeaver On Demand

- **Supplier services:** Sign, validate, timestamp, package – This function applies the required type of digital signature to e-invoices in a compliant process. It supports software-based (in EU terms: Advanced) electronic signatures and a variety of hardware-based (in EU terms: Qualified) electronic signatures. Multiple hardware Secure Creation Signature Devices (SSCDs) are supported, over which signing transactions can be load-balanced in order to increase performance. The signing function also normally adds validation information and timestamps.

- **Buyer services:** Validate, timestamp, package – This function validates signatures, in compliance with applicable legal requirements, when receiving an e-invoice. It supports multiple validation mechanisms and protocols, which allows the receiver to accept signatures based on certificates from a large number of CAs.

- **Audit tools:** Revalidate archived invoices - This function revalidates signatures on stored e-invoices and, where relevant, interprets embedded evidence of certificate validity at the time of signing or receipt of an invoice. Provided that the archived e-invoices contain signatures with time stamped revocation and certificate data, the verification process is carried out without any dependencies on online validation services.
- **Archive services:** Hash and timestamp - these functions allow buyers and suppliers to meet local legal requirements regarding time-stamping of previously archived invoices.

TrustWeaver On Demand enables an e-invoicing system and process to provide high levels of auditability and VAT/GST compliance over long periods of time. Depending on commercial arrangements with TrustWeaver, the solution can be relied on to evolve with time due to extensive legal research performed by TrustWeaver's broad network of law firms and experts.

## **PAGERO ARCHIVING SERVICE**

Pagero's archiving service corresponds to the legal terms and conditions of the supported countries giving suppliers, buyers and tax auditors the tools needed to easily access and re-validate signatures of archived invoices.

The archived invoices are stored in a SAN (Storage Area Network) on medium-performance disks raided for accessibility. The SAN is located in a SOX-compliant, secure data centre. The secure data centre is equipped and designed in an appropriate way to correspond to Pagero's strict safety requirements, both in terms of access control, fire safety and accessibility in general.

### **SUPPLIER SERVICES**

1. The received invoice data format, the internal XML, the outbound format and the PDF (signed or non-signed) are all archived. Archiving is first done in an interim Pagero Online archive for 90 days before being moved to the long-term archive.
2. The signed PDF that is the result from the signature call to TrustWeaver is stored on behalf of the supplier.
3. The suppliers or tax auditors can access the archived invoices through Pagero Online at any time during the storage period. (Pagero's central server user web interface for e-invoicing services).

### **BUYER SERVICES**

1. The received invoice data format (supplier file format), the internal XML, the outbound format (the buyer file format) and (if there is a signed PDF) are all archived. Archiving is first done in an interim Pagero Online archive for 90 days before being moved to the long-term archive.
2. The signed PDF that either is the result of a supplier's signature call to TrustWeaver or another Service Provider's signature provider (Supplier invoice sent to Pagero from another connected service provider), is sent to TrustWeaver for signature verification and when returned stored by Pagero on behalf of the buyer.
3. The buyers or tax auditors can access the archived invoices through Pagero Online at any time during the storage period. (Pagero's central server user web interface for e-invoicing services).

## **SOFTWARE INSTALL**

For the Pagero e-invoice solution to integrate with your invoicing system a piece of software called Pagero Connect™ is required. The Pagero Connect™ client contains all functionality needed to integrate your invoicing system with that of all your customers'. The software is available off our [www.pageroonline.com](http://www.pageroonline.com) website, and is kept up to date automatically using Java Web Start technology. The software requires Java on your computer.

The Pagero Connect™ client can be used as a client application for an individual user or be scripted for automatic execution by for example a scheduler. The latter is useful for bigger corporations utilizing an automated invoicing process.

## **COMMUNICATION**

Communication between senders of receivers of electronic invoices through the Pagero e-invoice server system is done using SSL-secured HTTP connections.

## **SECURITY**

We are very ambitious when it comes to security both for communication of invoices over the Internet and for the handling of information in the server system. The servers are operated in a SOX compliant location with best practice security and operational procedures based on ITIL.

## **SERVICE LEVELS**

The Pagero e-invoice service is offered under a service level agreement (SLA) guaranteeing an availability of 99.5 % on a monthly basis. The standard SLA is active during office hours; i.e. 09 – 16 CET. Other opening hours are subject to quote.

## **SYSTEM REQUIREMENTS**

- OS
  - o Windows 2000/XP/Vista
  - o Windows 2000 Server/ Windows Server 2003 (32/64 bit)
- Terminal Services/ Citrix/Remote Desktop
- 512 MB RAM, 1GHz processor
- Java 1.6 or later
- 128bit/s Internet connection
- Internet Explorer 6 or later, Firefox 1.5 or later