2017

Business Case
E-Invoicing / E-Billing

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1. E-invoicing opportunities in a challenging market environment

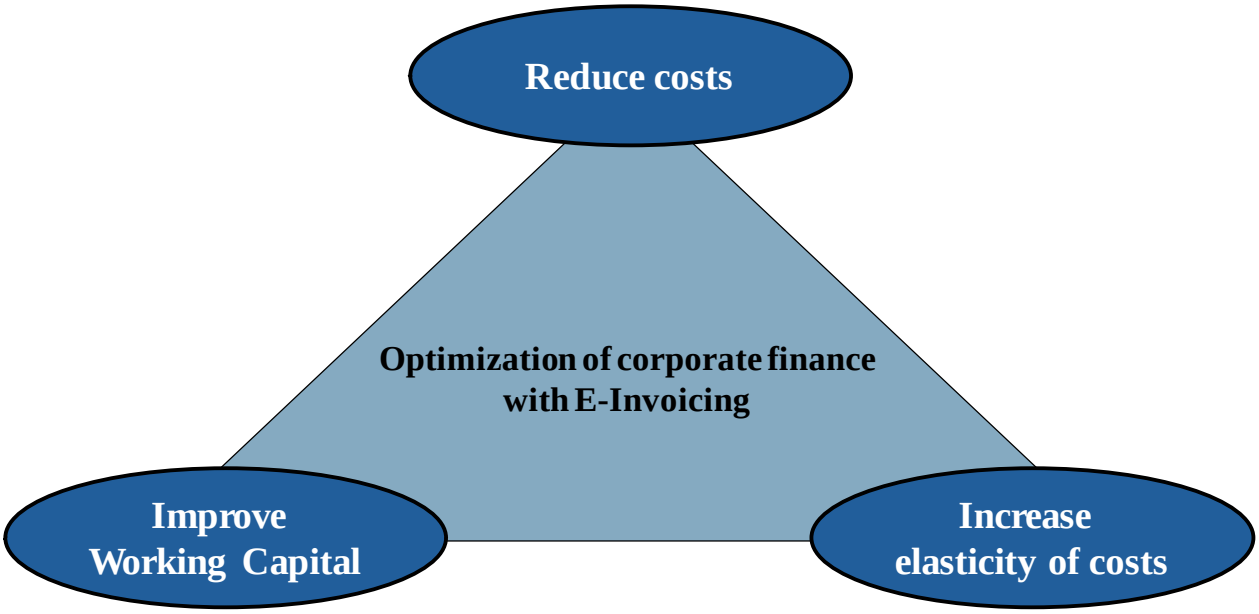
1.1 Overview

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.

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. This document will give the reader useful information for achieving these results.

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

Figure 1: Optimise corporate finances with e-invoicing

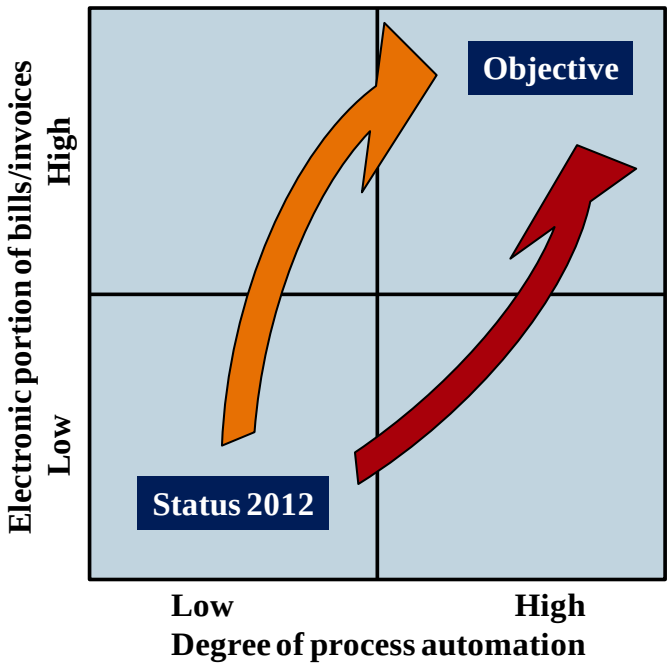


1.2 Reduce costs

Chapter 3 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.

The next chart describes the classical evolution in most organizations. Today, just low hanging fruits are picked. Very few enterprises also challenge their processes in general and streamline, re-design and optimize them. It is likely that it will take some more years until the market is mature for this next step. Thus, this chapter focuses on the migration path options.

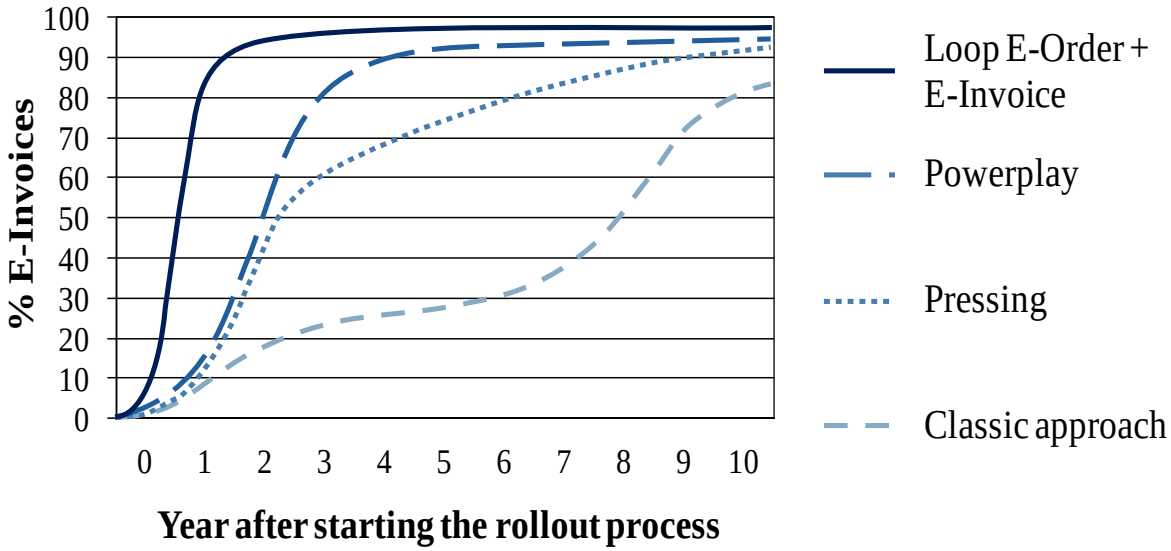
Figure 2: Migration path to exploit the full optimization potential



1.2.1 Increase electronic proportion

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

Figure 3: 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.

Phase	Description
	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 most countries. It did not cause a broad break-through in the markets up to to-day.
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, powerplay 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 powerplay, 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 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. This rate is steadily increasing. 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 more organizations do not switch to more promising on-boarding methods.

1.2.2 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

- 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
- PDF Images → structured XML invoices
- Scanning of images only → Scanning + OCR + Workflow

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.

1.3 Increase elasticity of costs

1.3.1 Inhouse developments vs. third party solutions

Businesses in smaller countries intend to use solutions proven on the market. Such solutions are indeed available in high numbers (hundreds) and of good quality. From this perspective, it is surprising that mainly businesses in larger countries still intend to re-invent things and develop inhouse solutions. This is not only the case with large organizations, but even in companies with less than 20,000 employees. In such scenarios, it is the IT staff who often drive projects. Clarifying legal requirements for all trading parties (located in dozens of countries) is extremely challenging or almost unsolvable for them. Such projects typically never succeed. Companies eventually switch to state-of-the-art third party solutions.

1.3.2 Shift fixed costs towards variable 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 are expected to change from inhouse 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.

1.4 Improve Working Capital

1.4.1 Challenges and today's options for organizations

The crisis in the global financial markets, a corporate credit squeeze, combined with weak economic growth, all 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.

1.4.2 Improving company internal processes

1.4.2.1 Increase transparency for inbound invoices

Typically, 30-35% 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.

1.4.2.2 Accelerate internal invoicing cycles for inbound invoices

Suppliers of goods and services suffer from the credit crunch. 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.

1.4.3 Trade Finance / Supply Chain Finance (SCF)

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.

The market opportunity for a SCF solution is significant. The total worldwide market for receivables management is US$1.3 trillion. Payables discounting and asset-based lending add an additional US$100 billion and $340 billion, respectively. Only a small percentage of companies are currently using SCF techniques, but more than half have plans or are investigating options to improve SCF techniques [Wikipedia]. Some 43% of German companies and 61% of British enterprises are planning to monetise their receivables & payables to provide liquidity within their supply chain [1]. In an US survey of 2014 [2], the percentage of respondents reporting that they use supply chain financing increased to 13.7 percent from 8 percent a year ago.

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.

One component of SCF is currently gaining much traction and forms an ideal combination with e-invoicing. It is therefore described in the following chapter.

1.4.4 Dynamic discounting

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.

2. Related processes and optimisation areas

Figure 4: Processes and optimisation areas for invoice/bill issuers

Issuer Process	Manual work and problems with paper based processes	Optimisation with e-invoice & automated processes
Print, Envelope Send	• High costs • Paper with negative impact on pollution • Long delivery time • No control over whether customers have received the invoices • Customer may reject the invoice weeks later if key data is missing from it	• Send electronic invoices securely via the net • Contributes an improvement of up to 0.8% to the Kyoto protocol requirements • Real-time delivery with receipt/download confirmation • Validation of key data as soon as sent
Payment Reminders	• 10-15% of invoice volume requires a payment reminder as recipients have time-consuming workflows and payment release systems for paper invoices	• Is reduced, as many of the clients process the electronic invoices automatically (below a certain amount and matching with order)
Remittance & Cash Management	• Time-consuming and costly manual processes • Data quality problems	• Automatic payment remittance • Due to faster electronic feedback regarding payment status, the Cash Manager has full control of all invoices, affording him optimised Cash Management
Archiving	• Hundreds or thousands of folders with paper invoices with high demand for storage capacity • High costs for manual search	• Automated archiving • Easy finding of the original invoice via various keywords • Quick access to the electronic archive in a decentralized environment • Instant on-screen auditability of invoices with unprecedented levels of integrity and authenticity guarantees • Millions of invoices only require the space of a hard disk

Figure 5: Processes and optimisation areas for invoice recipients

Recipient Process	Manual work and problems with paper based processes	Optimisation with e-invoice & automated processes
Receive	• Opening mail • Check and remove undesired attachments • Entrance stamp • Forward to AP department	• Fully automated
Entering Codification	• Entering to AP system • 10% of entered data statistically viewed with errors • Delayed entering during peak season or permanently • Alternative Scanning solves just a small part of the problem	• Automated import to AP system • Real-time import, independent of volume • 100% correct data
Validation & Matching	• Discrepancy in VAT compliance is detected at a (too) late stage • Line items in an invoice quite often contain a discrepancy with the order or contract terms. Manual matching is time-consuming and expensive	• VAT compliance and validation of other key data can be done automatically when E-Invoice is uploaded by issuer • Line-item matching with order data and contract term is fully automated • Faster and better spend analysis, leading to 1.3% to 5.5% spend reduction
Dispute Management	• The dispute resolution with the supplier is often done today by phone, unstructured email or fax • Dispute resolution can be very time consuming	• Improved dispute handling and avoidance • Many solutions or services enable automated, structured and real-time exchange of dispute information between buyers and suppliers
Payment & Cash Management	• Time consuming and costly circulation within the company for payment release; discounts are typically missed • Manual work for payment order and risk of errors • Cash Manager without full transparency for all pending invoices	• Payment relevant invoice data processed directly and automatically into payment orders • Every inbound invoice appears on the screen of the Cash Manager immediately after receipt and affords him optimised Cash Management (by offering rebates for payment on time, working capital optimisation) • Circulation within company for payment release is automated or at least supported by electronic workflow

Recipient Process	Manual work and problems with paper based processes	Optimisation with e-invoice & automated processes
		• In larger organisations, it is not unusual to benefit of additional 1.50 Euro discount per e-invoice in average
	• Hundreds or thousands of folders with paper invoices with high demand for storage capacity • High costs for manual search • Traditionally 6 copies on industry average, not all clearly stated as “copy”	• Automated archiving • Easy finding of the original invoice via keywords • Quick access to the electronic archive in a decentralised environment • Instant on-screen auditability of invoices with unprecedented levels of integrity and authenticity guarantees • Millions of invoices only require the space of a disk

3. Business Case for Issuer/Recipient

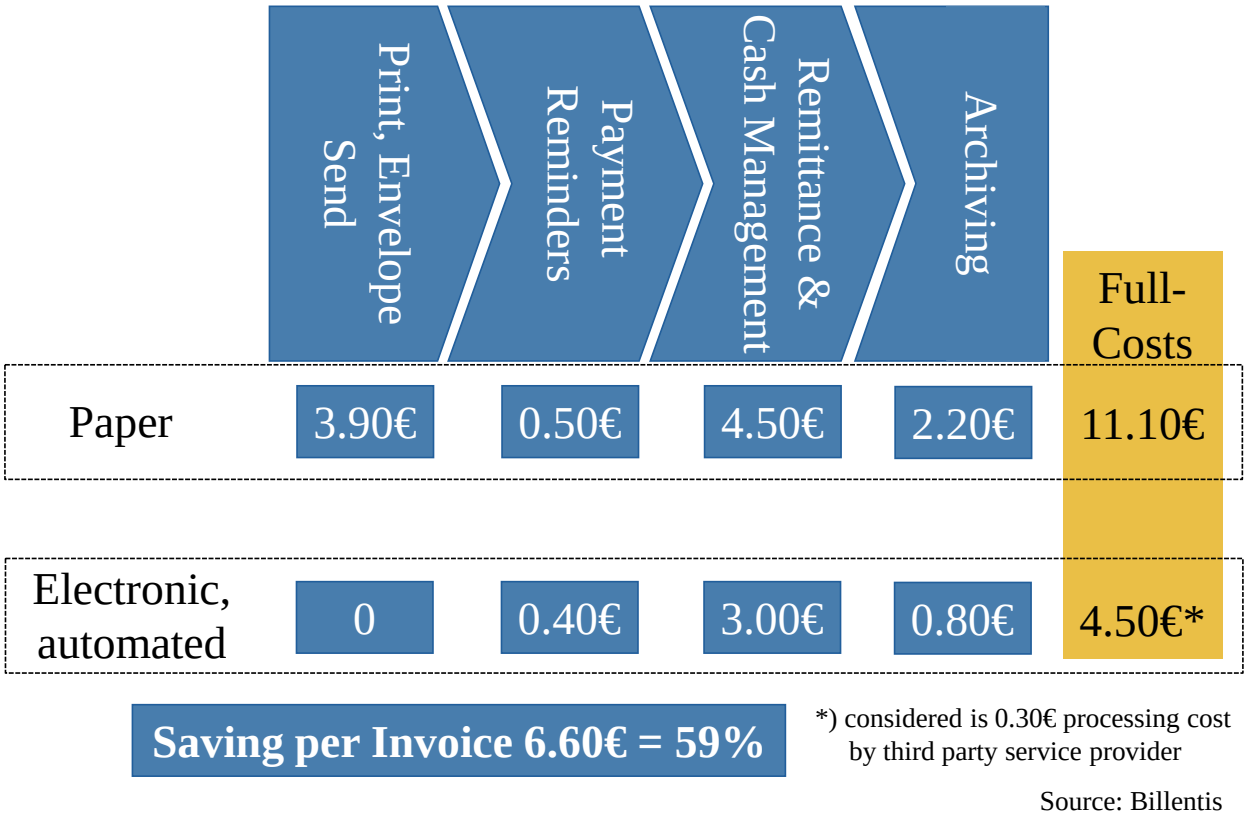
3.1 Saving potential

The Finnish State Treasury and some Finnish companies have estimated that an incoming paper invoice incurs costs amounting to 30-50 Euro for the receiving company. By moving to electronic invoicing these costs can be reduced to 10 Euro by semi-automating the invoice process and to one Euro by fully automating the process [3]. Regarding in-depth analysis of Politecnico di Milano, the net benefits are 4 – 12 Euro per invoice in case of VAT compliant e-invoicing and up to 65 Euro per cycle in case of full integration of the trade process [4].

Thanks to electronic and automated invoice processing, savings between 1 and 2% of turnover are realistic objectives.

As a consultant the author analysed the full costs based on traditional paper based processes and compared it with the new electronic automated solution. The example below reflects the situation in an industry company with 5,000 employees, based on calculated staff costs of 60€/hour (full costs including overhead, working place, etc.).

Figure 6: Saving potential for invoice/bill issuers (actual customer case)

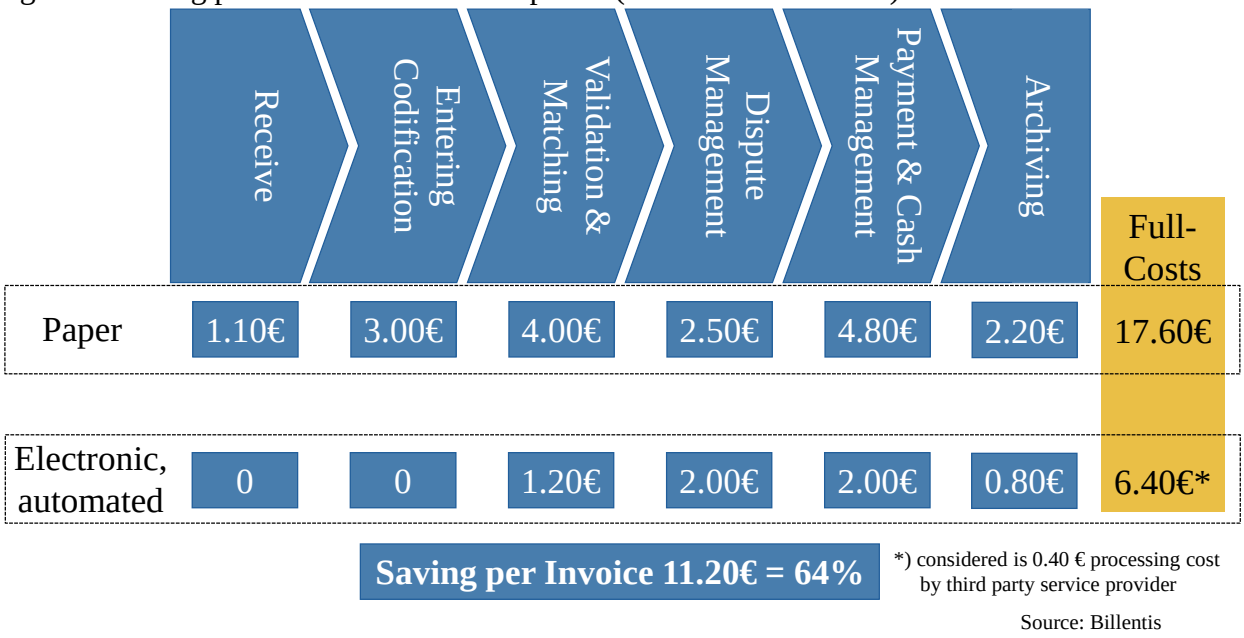


Source: Billentis

The invoices/bills in this example were relatively simple and had an average size of 1.5 pages. In most organisations, the invoices are more complex and the savings are higher.

Not considered in this calculation are indirect savings. This can include, for example, online updating of master data directly by the customers.

Figure 7: Saving potential for invoice recipients (actual customer case)



Source: Billentis

Not considered in this calculation are indirect savings. This can include, for example, the elimination of redundancies of the supplier master data and inconsistencies.

3.2 Know your volume

Sometimes, larger organisations do not know their precise invoice/bill volume. The reason for this is quite often the decentralised organisation or a heterogeneous layout of their AR and AP systems.

Over the last 20 years, the author has built key-metrics for being able to make a quick estimation of the invoice volume before the project start. Although not perfect in all cases, the key-metrics are based on the number of employees in an organisation and dependent on the industry.

Figure 8: Key-metrics for number of invoices

Indication for Number of invoices per employee in various Industries	Outbound invoices per employee and year	Inbound invoices per employee and year
Credit & Customer Cards	40,000	n/a
Mail order houses	8,000	n/a
Media	2,000	20
MRO Goods	1,400	450
Utility with direct distribution	1,200	20
Insurance	700	30
Electronic & IT	400	26
Chemicals & Pharmaceuticals	200	30
Industry independent average	200	80
Automotive Supplier	200	50
Food Supplier	200	20

Indication for Number of invoices per employee in various Industries	Outbound invoices per employee and year	Inbound invoices per employee and year
Logistics	100	77
Airlines	35	11
Services & Consulting	20	15
Banks	n/a	11
Telco	n/a	39
Industrial manufacturer	n/a	60
Catering	n/a	100
Retail	n/a	250
Buyer Clubs, Trade, Wholesalers	n/a	300
Health insurance	n/a	3,100[1]

In groups with service centres and/or subsidiaries, up to 10% can be added to the inbound volume for Intercompany Billing.

Calculation example: Utility Group with service centre structure and 5,000 employees

Outbound Volume	5,000 x 1,200	= 6,000,000
Inbound Volume	5,000 x 20	= 100,000
Intercompany Billing	10% of Inbound	= 10,000

3.3 Know your current and future costs

At first glance only direct costs appear in the organisation budget. However, this is just a fraction of all processing costs.

For a cost comparison, we have to consider
- Direct costs
- Indirect costs
- Hidden costs

3.3.1 Current costs for outbound invoices

On the outbound side, one part of the direct costs includes invoice printing and stamp costs. In a well-known telecom company, this represents just 9% of all directly related costs. Another major part is quite often well hidden and not recognised at first glance. Indirect and hidden cost items, which may be reduced by e-invoicing are
- Sales Back office (Further inquiries in case of dispute)
- Accounting/Reconciliation manpower
- Debtor interest
- IT development and operation
- Payment fees (reduced or no fees in case of electronically and fully automated processes)
- Customer requests for copies of lost invoices

[1] In countries with healthcare systems like The Netherlands, Switzerland etc.

- Archiving
- Query handling
- Settlement time and improved Cash Management
- Easier and faster audit

Typically, just 7,500 – 30,000 paper invoices can be processed per employee per year in the AR department. Therefore, the direct staff costs in the AR department already vary between EUR 2.50 – 10 per invoice.

3.3.2 Current cost for inbound invoices

Even worse is the cost recognition on the inbound side. Per employee in the AP department, typically just 5,000 – 15,000 paper invoices can be processed per year. Therefore, the direct staff costs in the AP department already vary between EUR 5 – 15 per invoice. Further costs are generated in the paper-based workflow and archiving. Analysis in some organisations showed, that on average 6 invoice copies are generated and archived decentralised in the files of secretaries and heads of departments.

3.3.3 Cost differences among continents and countries

The figures in the previous chapters are generally appropriate for Europe and probably for most parts of Latin America and Asia. Of course, we do have major differences in the labour costs, which are lower in Mediterranean countries than in the Nordic states. Nevertheless, exactly the countries with lower labour costs have in most cases the highest legal requirements for invoicing and are therefore not necessarily able to process the invoices for lower costs.

Surveys imply that invoice processing in the US could be around 25 percent less expensive than in Europe. This is understandable for several reasons. The US does not apply the VAT system like many other countries. The invoice is just one of several business documents for the audit trail. The legal requirements are lower. The US is in addition more harmonized than the various legislations in Europe. Furthermore, US enterprises have in most cases to support just one or two languages for the invoice processing. In some but not all cases, economies of scale also help US titans to achieve lower invoice processing costs than the majority of comparatively small European companies.

This does not however reduce the relative saving potential compared to today's paper processing costs.

3.3.4 Future costs with automated processes

Small companies using e-invoicing via website, have no implementation costs and very moderate or no running costs.

Besides the integration costs, large accounts have to consider the project costs.

In addition, third party service providers often charge a time and volume based fee for issuers and/or recipients. The level of these costs varies considerably depending on customers' requirements. It is best to summarise customers' requirements in a document (Request for Proposal) and ask for binding proposals. As an indication, third party costs of EUR 0.20 – 0.80 per invoice should be entered into the business case.

Future internal costs will probably be 40-50% of past costs depending on the individual situation (see also example in chapter "3.1 Saving Potential").

World class enterprises are able to process 125,000+ electronic invoices per year and AP employee, roughly 10 times more than paper based invoices.

3.4 Business Case

3.4.1 Small businesses

Their large suppliers and clients quite often push them to accept respectively send electronic invoices "as part of the general contract terms or business rules". Therefore, it is not necessarily the business case pushing them forward for electronic invoicing but good business relationships with their trading partner.

However, in most cases they find an easy and efficient way to practise it. This can be the use of an invoicing portal, where invoices can be uploaded or downloaded and stored for several years in a VAT compliant manner. Either no implementation is necessary or the effort required is very moderate. Key-in invoices on the portals of each large customer is however unpopular among suppliers and many insist on paper as long as they can. It is slightly better if the suppliers can key-in the invoices on the web portals of independent service providers and address several customers via the same platform. The absolute favourite for small businesses is to push PDF invoices to their customers (if they accept PDFs). This method is supported by numerous tools, and is quick and inexpensive.

3.4.2 Mid-sized and large businesses

Many solution providers offer an online business case calculation tool. Tools and ROI calculaters are also offered by some universities and industry portals.

As many readers of this report perhaps cannot understand the language in some ROI calculators, here is a translation of the major points to be considered.

Figure 9: Items to be considered in a business case

Item to be considered in a business case	Issuer	Recipient
Quantities and basic data - Number of electronic counterparts - Electronic proportion of total invoice volume - Interest rate - Hourly rate of employees	x	x
Customer churn rate with and without e-invoicing	x	
Costs and Savings in the AR & archiving department	x	
Costs and Savings in the AP & archiving department		x
Cash Management, payment due period, payment discount	x	x
Initial costs (Project, implementation, hardware, software)	x	x
Operation costs internal and third party	x	x

3.4.3 Financial benefits for the public sector

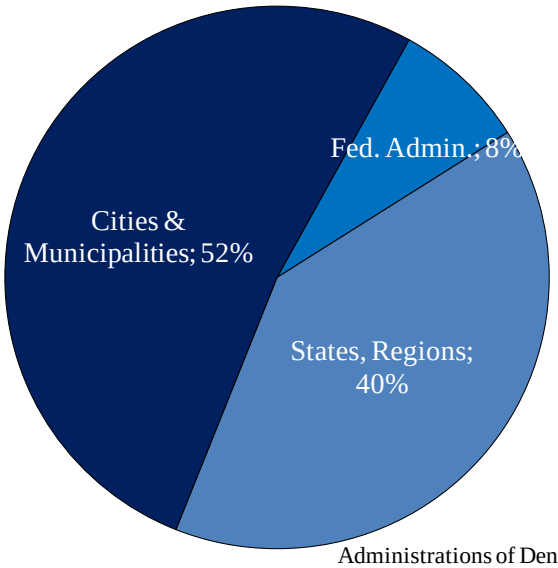
With at least 10% of the market invoice volume, the public sector belongs to the "Top 3 industries". Measured by the number of trading parties, it is the clear leader: 45-65% of all companies in a country are suppliers to the public sector and send invoices to it. 100% of enterprises and households receive invoices from the public sector. That is why e-invoicing initiatives by the public sector are key for the development of the whole country. Unfortunately, this sector often belongs to the laggards, despite the huge saving potential.

If a major proportion of paper invoices were replaced by electronic ones, the annual saving potential in Europe's public sector could be at least 40 billion Euro (for inbound and outbound invoices). Today, less than 10% of it is exploited.

This tremendous saving potential is recognized in many countries, but to exploit it within reasonable time is another story. The federal administration is privileged to go into a leading role and to facilitate a country-wide public sector project. As the public sector itself is very fragmented, many stakeholders have to be involved and convinced.

The breakdown of volume in the Danish and Swiss public sector is known. The mix of these two countries is shown in the next chart.

Figure 10: Breakdown of saving potential in the public sector



Sources: Federal Administrations of Denmark & Switzerland

In the broadest sense, this breakdown might also be applicable for many other countries. Assuming so, the saving potential breakdown for various countries could look as shown in the following table.

Figure 11: Indication for the saving potential in the public sector of some European countries

Country	Minimum public sector saving potential (million Euro a year)	States, Regions	Cities & Municipalities
Austria	600 [5]	200	300
Belgium	900	400	470
France	4,200	1,700	2,200
Germany	6,500	2,600	3,400
Italy	3,000	1,200	1,600
Poland	1,700	700	900
Romania	1,400	600	700
Spain	1,800	700	900
Sweden	1,600	600	800
Switzerland	700	300	400
The Netherlands	1,200	500	600
United Kingdom	4,400	1,800	2,300

The difference to the total “public sector saving potential” above is the saving potential for the federal administration.

The above estimate is based on the assumption that 40% of the e-invoices are exchanged in unstructured format (PDF) and 60% with structured XML invoices (fully automated processes). Many administrations insist on just structured invoice data. Their potential is higher than the figures above.

As attractive as e-invoicing in the public sector appears, it is just as challenging to implement. The public sector is not one homogenuous segment. The state administration forms one part. In addition, we find regions, cities and municipalities. Many countries have a federalist structure with high autonomy for each entity. However, Brazil and Mexico have proved that it is possible to establish e-invoicing country-wide, even with a federal structure.

The state government has the most power regarding legislation and is preferred to initiate and steer such projects. However, the saving potential in their segment is just a small proportion within the public sector.

Cities are in an excellent position to push e-invoicing/e-billing and to save much money. The author collected various data and built key-metrics over the year. Of course, the key-metrics can vary a great deal from country to country and city to city. On average, a city receives one invoice per year and inhabitant. Cities, including all its service units (taxes, energy distribution, garbage removal, communication, etc.), issue typically 2-6 bills/invoices per year and inhabitant.

The estimated saving potential for cities is based on the assumption that 40% of the e-invoices are exchanged in unstructured format (PDF) and 60% with structured XML invoices (fully automated processes).

Figure 12: Saving potential for cities

Population (Millions)	**Example of city (or metropolis) in this category** Based on population as published in Wikipedia	**Minimum annual saving potential (million Euro)**
0.5	Atlanta, Bradford, Boston, Bratislava, Bremen, Copenhagen, Denver, Dortmund, Dublin, Duesseldorf, Duisburg, Edinburgh, Essen, Frankfurt, Genoa, Gothenburg, Hanover, Helsinki, Kaunas, Leeds, Leipzig, Lisbon, Liverpool, Málaga, Manchester, Miami, Palermo, Rotterdam, Seattle, Seville, Sheffield, Stuttgart, Tallinn, Thessaloniki, Toulouse, Vilnius, Washington, Zaragoza, Zurich	15
1	Adelaide, Amsterdam, Asturias, Athens, Auckland, Birmingham, Biscay, Brussels, Calgary, Cologne, Dallas, Edmonton, Jacksonville, Indianapolis, Kraków, Lyon, Lille, Marseille, Milan, Munich, Naples, Nice, Ottawa–Gatineau, Phoenix, Prague, San Antonio, San Diego, San Francisco, San Jose, Sofia, Stockholm, Turin, Valencia, Wellington	30
2	Barcelona, Brisbane, Bucharest, Budapest, Hamburg, Houston, Paris, Philadelphia, Vancouver, Vienna, Warsaw	55
3	Berlin, Chicago, Madrid, Rome	80
4	Los Angeles, Montreal	110
5	Sydney, Toronto	130
7	London, New York, Tokyo	200
10	Moscow	270

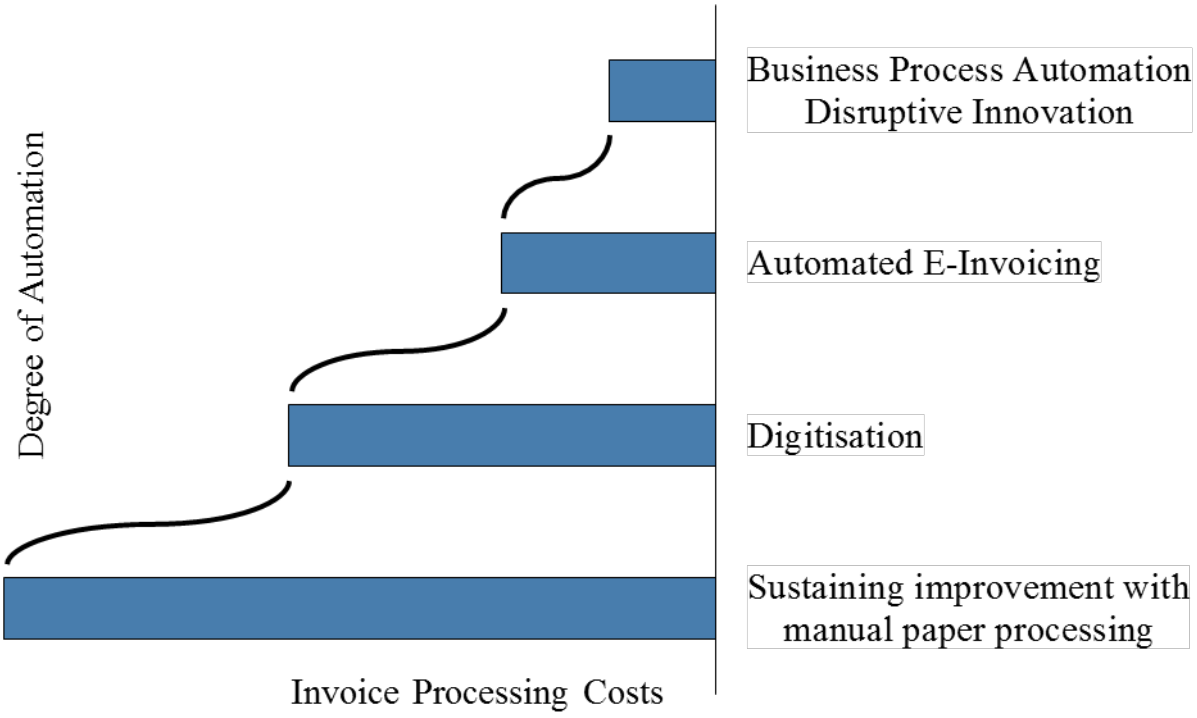
4. Digitisation & Automation

4.1 From gradual evolution to innovative business process automation

Remark: In order to simplify the description, the author focuses 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, the author 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 13: From gradual evolution to innovative business process automation



4.2 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 DSO 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.

4.3 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.

4.4 Automated e-invoicing

The legislation in many countries (in Europe, North America, Pacific etc.) 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 them, 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 improved. 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[2].

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.

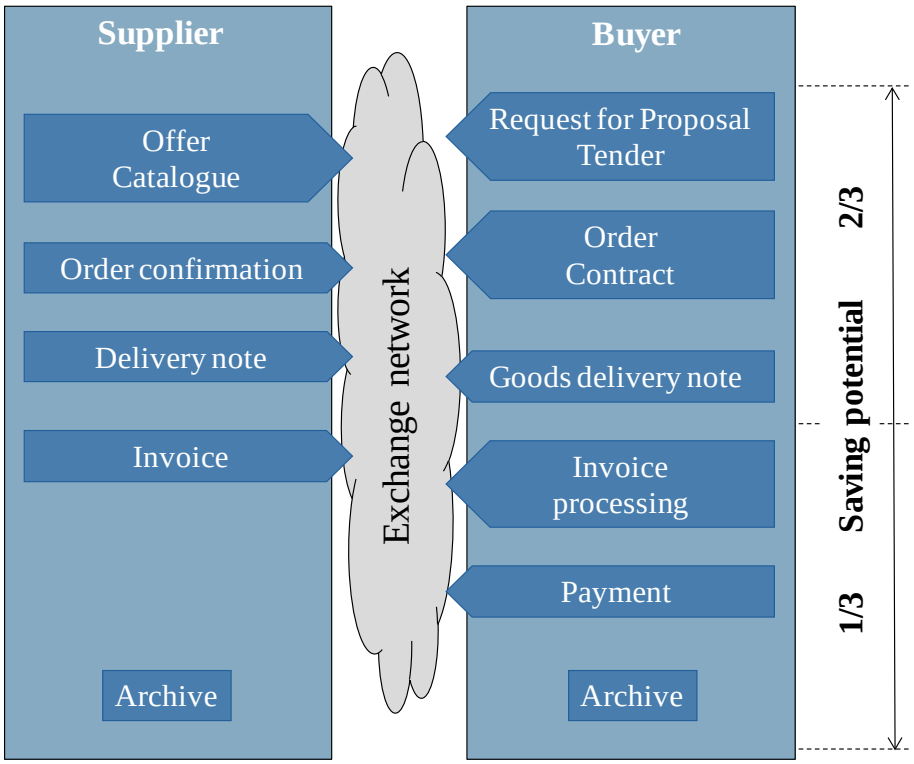
Structured e-invoices build a good starting basis for value-added services and the easier implementation of trade financing services.

4.5 Business process automation with disruptive innovation

More advanced organisations might have a broader objective than merely to optimise invoice processes. This is indeed a worthwhile undertaking: the automation and optimisation of the invoice process typically represents only one third of the total potential. In light of this, the full purchase-to-pay and order-to-cash process may be brought to the foreground over the coming years.

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

Figure 14: Exploit the full optimisation potential



Many businesses seeking to optimise the full purchase-to-pay and order-to-cash cycle intend to replace paper processes with electronic processes. They can thereby achieve substantial savings. However, it can be worthwhile to critically scrutinise the current processes and systems. Both of which likely evolved over one or two decades. Gradual improvements achieved by substituting paper-based processes are positive, however it is possible to take a disruptive approach and thereby improve the entire financial supply chain by many factors.

Experience shows that often one third of the sub-processes can be removed without losing anything essential. Monolithic systems can be replaced by cloud services on a modular basis. Costs can be significantly reduced and the organisations following this approach can become more agile.

5. Appendix: Sources

Figure 15: Key sources used in this report

Ref	Document and/or hyperlink	Date or version
[1]	Demica, A Rising Role, "A study in the growth of Supply Chain Finance, as evidenced by SCF-dedicated job titles at top European banks"	April 2014
[2]	IOFO, 2014 AP Automation Study	2014
[3]	Helsinki School of Economics, "Electronic Invoicing Initiatives in Finland and in the European Union"	2008, B-95
[4]	Politecnico di Milano, Alessandro Perego, Presentation "Process Optimization and Saving Potential with e-Invoicing" at the EXPP Summit in Munich/Germany	October 2010
[5]	Billentis, Nutzenpotenziale der E-Rechnung http://wko.at/e-rechnung	October 2011